The Tiger Moths of the Former Soviet Union

Insecta: Lepidoptera: Arctiidae
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THE TIGER
MOTHS OF THE
FORMER SOVIET UNION

(INSECTA: LEPIDOPTERA: ARCTIIDAE)

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Contents

I. Introduction ................................................................................................................................. 1
II. General part ............................................................................................................................... 3
III. Special part .............................................................................................................................. 15

Subfamily Arctiinae ...................................................................................................................... 42

1. Genus Callimorpha Latreille, 1809 .......................................................................................... 15
   1. Callimorpha dominula (Linnaeus, 1758) .............................................................................. 15
   2. Callimorpha philippisi Bartel, 1906 .................................................................................... 17
2. Genus Euplagia Hübner, 1820 .................................................................................................. 18
   3. Euplagia quadripunctaria (Poda, 1761) .................................................................................. 18
   4. Euplagia splendidao (Tams, 1922) ....................................................................................... 19
   5. Eucallimorpha principalis (Kollar, 1844) .......................................................................... 20
   Genus Aglaomorpha Kôda, 19873 ............................................................................................. 21
      Aglaomorpha histrio (Walker, 1855) ..................................................................................... 21
4. Genus Cymbalophora Rambur, 1866 ...................................................................................... 22
   6. Cymbalophora ricularis (Ménétriës, 1832) .......................................................................... 22
5. Genus Carcinopyga Felder, 1874 ............................................................................................. 22
   7. Carcinopyga lichenigera Felder, 1874 .................................................................................. 23
   8. Carcinopyga proserpina (Staudinger, 1887) ..................................................................... 23
   9. Carcinopyga gurkoi Kautt & Soldaitis, 1997 ..................................................................... 24
6. Genus Axiopoena Ménétriës, 1842 ......................................................................................... 26
   10. Axiopoena maura (Eichwald, 1830) .................................................................................. 26
   11. Axiopoena karelina Ménétriës, 1863 ................................................................................ 27
7. Genus Tyria Hübner, 1819 ..................................................................................................... 28
   12. Tyria jacobaeae (Linnaeus, 1758) ..................................................................................... 28
8. Genus Dodia Dyar, 1901 ........................................................................................................ 29
   13. Dodia diaphana (Eversmann, 1848) ................................................................................... 30
   14. Dodia albertae Dyar, 1901 ................................................................................................ 31
   15. Dodia kononenkoi Tshistjakov & Lafontaine, 1984 ......................................................... 33
   16. Dodia sazonovi Dubatolov, 1990 .................................................................................... 34
9. Genus Epimydia Staudinger, 1892 ........................................................................................ 35
   17. Epimydia didampra Staudinger, 1892 .............................................................................. 35
10. Genus Lacydes Walker, 1855 ............................................................................................... 35
   18. Lacydes spectabilis (Tausecher, 1806) ............................................................................ 36
11. Genus Spiris Hübner, 1819 ................................................................................................... 37
   19. Spiris striata (Linnaeus, 1758) ......................................................................................... 37
   20. Spiris bipunctata (Staudinger, 1892) ................................................................................. 38
12. Genus Coscinia Hübner, 1819 ............................................................................................. 38
   21. Coscinia cribaria (Linnaeus, 1758) ................................................................................... 39
13. Genus Utetheisa Hübner, 1819 ........................................................................................... 40
   22. Utetheisa pulchella (Linnaeus, 1758) .............................................................................. 40

Subfamily Arctiinae ...................................................................................................................... 42

15. Genus Parasemia Hübner, 1820 ........................................................................................... 43
24. Parasemia plantaginis (Linnaeus, 1758) ................................................................. 43
16. Genus Hyphoraia Hübner, 1820 ........................................................................ 46
25. Hyphoraia audica (Linnaeus, 1758) .................................................................. 46
17. Genus Pararctia Sotavalta, 1965 ..................................................................... 48
26. Pararctia lapponica (Thunberg, 1791) ................................................................. 49
27. Pararctia lemmiscata (Stichel, 1911) ................................................................. 50
28. Pararctia tundrae Tshistjakov, 1990 ................................................................. 50
Genus Sinoarctia Dubatolov, 1987 ....................................................................... 51
18. Genus Borearctia Dubatolov, 1984 .................................................................. 51
29. Borearctia menetriesi (Eversmann, 1846) ......................................................... 52
19. Genus Acerbia Sotavalta, 1963 ......................................................................... 52
30. Acerbia alpina (Quensel, 1802) ....................................................................... 52
31. Acerbia seitzi (A. Bang-Haas, 1910) ................................................................. 53
Acerbia kolpakowski (Alpheraky, 1882) ............................................................... 54
20. Genus Platarctia Packard, 1864 ........................................................................ 54
32. Platarctia atropurpurea (O. Bang-Haas, 1927) ................................................ 54
21. Genus Oroncus Seitz, 1910 ............................................................................... 56
33. Oroncus tancrei (Staudinger, 1887) ................................................................. 57
34. Oroncus urania (Püngeler, 1904) ..................................................................... 57
35. Oroncus fasciata O. Bang-Haas, 1927 ............................................................... 58
36. Oroncus altaica O. Bang-Haas, 1927 ................................................................. 58
Genus Orontobia de Freina, 1997 ........................................................................ 59
Genus Preparctia Hampson, 1901 ....................................................................... 60
22. Genus Arcia Schrank, 1801 ............................................................................... 60
37. Arcia intercalaris (Eversmann, 1843) ................................................................. 62
Arcia ladakensis (O. Bang-Haas, 1927) ............................................................... 63
38. Arcia caja (Linnaeus, 1758) ............................................................................. 63
39. Arcia florea (Fuessly, 1779) ............................................................................. 66
40. Arcia rucekelli (Püngeler, 1901) ..................................................................... 68
41. Arcia obschezangi Dubatolov, 1990 ................................................................. 68
23. Genus Epicallia Hübner, 1820 ......................................................................... 70
42. Epicallia villica (Linnaeus, 1758) .................................................................... 70
24. Genus Euchararia Hübner, 1820 .................................................................... 71
43. Euchararia festiva (Hüfnagel, 1766) ................................................................. 71
44. Euchararia interrogationis (Ménétriès, 1863) ................................................. 74
45. Euchararia culoti (Oberthür, 1912) ................................................................. 75
25. Genus Pericallia Hübner, 1820 ........................................................................ 76
46. Pericallia matronula (Linnaeus, 1758) .............................................................. 76

Subfamily Micrarctiinae ......................................................................................... 77
Genus Micrarctia Seitz, 1910 ............................................................................... 77
26. Genus Diacarctia Dubatolov, 1990 .................................................................. 78
47. Diacarctia dea (Staudinger, 1887) ................................................................. 79
27. Genus Tancrea Püngeler, 1898 ...................................................................... 79
48. Tancrea pardalina Püngeler, 1898 ................................................................. 79
28. Genus Holoarctia Ferguson, 1984 ................................................................. 80
49. Holoarctia cervini (Fallou, 1864) ................................................................. 80
50. Holoarctia marinae Dubatolov, 1985 .............................................................. 81
51. Holoarctia puengeleri (O. Bang-Haas, 1927) ................................................. 82
29. Genus Palearctia Ferguson, 1984 ................................................................... 83
52. Palearctia (Palearctia) mira Dubatolov & Tshistjakov, 1989 .................... 84
53. Palearctia (Palearctia) glaphyra (Eversmann, 1843) .................................... 84
54. Palearctia (Palearctia) dubitata (O. Bang-Haas, 1927) ............................. 86
55. Palearctia (Palearctia) gratiosa (Groum-Grshiimailo, 1890) ..................... 87
56. Palearctia (Palearctia) gracilis Dubatolov, 1996 ................................................................. 90
57. Palearctia (Palearctia) gobeckii Dubatolov, 1996 .............................................................. 91
58. Palearctia (Palearctia) rupicola (Groum-Grshimaïlo, 1890) ................................................ 91
62. Palearctia (Palearctia) zagseri (Püngeler, 1918) ................................................................. 92
59. Palearctia (Palearctia) erschoffi (Alpheraky, 1882) ........................................................... 92
60. Palearctia (Palearctia) ferghana (Staudinger, 1887) ............................................................ 94
61. Palearctia (Centrarcicia) mongolica (Alpheraky, 1888) ...................................................... 96
62. Palearctia (Palearctia) sorycola de Freina, 1997 ................................................................. 96
30. Genus Sibirarcia Dubatolov, 1987 ......................................................................................... 97
63. Sibirarcia kindermanni (Staudinger, 1867) .......................................................................... 98
64. Sibirarcia burectica (O. Bang-Haas, 1927) ........................................................................... 100
31. Genus Chelis Rambur, 1866 ................................................................................................. 101
65. Chelis maculosa (Gerning, 1780) ......................................................................................... 102
66. Chelis reticulata (Christoph, 1887) ..................................................................................... 103
67. Chelis cucullia (Kindermann, 1853) .................................................................................... 104
68. Chelis daurica (Boisdruval, 1832) ...................................................................................... 106
69. Chelis ferghana Dubatolov, 1988 ....................................................................................... 107
70. Chelis tianshan Dubatolov, 1988 ....................................................................................... 107
32. Genus Grammia Rambur, 1866 ........................................................................................... 108
71. Grammia quenseli (Paykull, 1793) ..................................................................................... 108
72. Grammia philippiana Ferguson, 1985 .................................................................................. 109
73. Grammia turbans (Christoph, 1892) ................................................................................... 110
33. Genus Hyperborea Groum-Grshimaïlo, 1899 ..................................................................... 110
74. Hyperborea czechowskii Groum-Grshimaïlo, 1899 ........................................................... 110
34. Genus Diacristia Hübner, 1819 ........................................................................................... 111
75. Diacristia samia (Linnaeus, 1758) ..................................................................................... 112
76. Diacristia irene Butler, 1881 .............................................................................................. 114
35. Genus Rhyparioides Butler, 1877 ....................................................................................... 114
77. Rhyparioides metellana (Lederer, 1861) .............................................................................. 115
78. Rhyparioides amurenensis (Bremer, 1861) .......................................................................... 116
79. Rhyparioides nebulosa Butler, 1877 ................................................................................... 117
36. Genus Rhyparia Hübner, 1820 ............................................................................................ 117
80. Rhyparia purpurata (Linnaeus, 1758) .................................................................................. 117
37. Genus Amurrhyparia Dubatolov, 1985 ............................................................................... 119
81. Amurrhyparia leopardinula (Strand, 1919) ........................................................................ 119
Genus Gonerda Moore, 1879 .................................................................................................. 119

Subfamily Spilosomatinae ........................................................................................................... 120
38. Genus Oenoxya Lederer, 1853 ............................................................................................ 120
82. Oenoxya parasita (Hübner, 1790) ....................................................................................... 120
83. Oenoxya armena Staudinger, 1871 .................................................................................... 122
84. Tajgyna gansoni Dubatolov, 1990 ..................................................................................... 123
40. Genus Watsonarcia de Freina & Witt, 1984 ......................................................................... 124
85. Watsonarcia desert (Bartel, 1902) ..................................................................................... 124
41. Genus Chionarctia Koda, 1988 ............................................................................................ 125
86. Chionarctia nivea (Ménétriës, 1859) .................................................................................. 125
42. Genus Alphaea Walker, 1855 ............................................................................................... 126
87. Alphaea melanostigma (Erschoff, 1872) ............................................................................. 126
43. Genus Andula Walker, 1855 .................................................................................................. 126
88. Andula guttata (Erschoff, 1874) ......................................................................................... 127
89. Andula transversa (Moore, 1879) ....................................................................................... 127
44. Genus Hyphantria Harris, 1841 ........................................................................................... 128
90. *Hyphantria cunea* (Drury, 1773) ................................................................. 128
45. Genus *Diaphora* Stephens, 1827 ............................................................... 129
91. *Diaphora mendica* (Clerck, 1759) ............................................................... 129
46. Genus *Eudiaphora* Dubatolov, 1990 ............................................................ 130
92. *Eudiaphora turensis* (Erschoff, 1874) ......................................................... 130
47. Genus *Spilosoma* Curtis, 1825 .................................................................... 132
93. *Spilosoma lubricipeda* (Linnaeus, 1758) ....................................................... 132
94. *Spilosoma punctarium* (Stoll, 1782) ............................................................. 133
95. *Spilosoma urticae* (Esper, 1789) ................................................................. 134
96. *Spilosoma mandli* Schawerda, 1922 ............................................................ 135
97. *Spilosoma streltsoci* Dubatolov, 1996 ......................................................... 136
*Spilosoma album* Bremer & Grey, 1853 ......................................................... 136
48. Genus *Spilarctia* Butler, 1875 .................................................................... 137
98. *Spilarctia lutea* (Hüfnagel, 1766) ................................................................. 137
99. *Spilarctia seriatopunctata* (Motschulsky, 1861) ......................................... 139
100. *Spilarctia obliquizonata* (Miyaki, 1910) ..................................................... 140
101. *Spilarctia subcarnea* (Walker, 1855) ......................................................... 140
49. Genus *Lemyra* Walker, 1856 ..................................................................... 141
102. *Lemyra boghaika* Tshistjakov & Kishida, 1994 ....................................... 141
103. *Lemyra jankowskii* (Oberthür, 1881) ......................................................... 142
50. Genus *Phragmatobia* Stephens, 1828 ........................................................... 142
104. *Phragmatobia fuliginosa* (Linnaeus, 1758) .................................................. 143
105. *Phragmatobia amurensis* Seitz, 1910 ........................................................... 145
106. *Phragmatobia placida* (Frivaldzsky, 1835) ................................................ 145
51. Genus *Epatolmis* Butler, 1877 ................................................................... 146
107. *Epatolmis luctifera* (Denis & Schiffermüller, 1775) ............................... 146

Conclusions ........................................................................................................... 147

Acknowledgements .............................................................................................. 148

IV. Addenda .......................................................................................................... 149

V. Colour Plates .................................................................................................... 189
I. Introduction

Tiger moths, or the moth family Arctiidae, are usually small to medium-sized, of varying coloration, often light or bright. The pattern contains stripes, bands or spots on the wings and body. The wings hold roof-like while at rest.

Tiger moths are truly beautiful adornments of nature. At the same time, because of their great diversity coupled with profound variation, these moths are not only of aesthetical pleasure but also provide rich material for research and scientific generalizations. Unfortunately (or fortunately?), the tiger moth fauna of the Palaearctic, in particular of its bulk that covers the former Soviet Union, is still relatively poorly known. Hence, the need in a book like this one is clear, even though it is only a complete and richly illustrated overview of the fauna.

We have tried to get all available material and other information concerning this family, especially as regards its Palaearctic species. However, despite all efforts, this publication must be understood as provisional, still containing numerous lacunae and inaccuracies. This is not a revision but a review of the Arctiidae at a regional level, more specifically, written to attract attention, mainly that of the young, to this interesting group. Indeed, to illustrate the still relatively poor state of the art, a considerable number of new tiger moth taxa have lately been described from the territory of the former Soviet Union, and several new synonymies and combinations established. Surely, future studies are bound to reveal lots of further novelties.

Although most of the tiger moth species can be identified using external characters alone, there are some groups that require the examination of the genitalia for revealing their correct identity. So pertinent illustrations of the genitalia, both old and new, have always been provided wherever necessary.

Some tiger moths have long entered regional or general lists of protected species, e.g. the Red Data Book of the former Soviet Union (Borodin, 1984a, b), often without any serious reason for doing so. For example, Utetheisa pulchella (L.) is amongst such “endangered” forms. It is widespread over southern Europe and Asia, in Central Asia often abundant, also present in India, Japan, Africa, and even Australia. Such a vast distribution may be due to feeding on cotton plants recorded for this species in many places. So it can readily be referred to as a migrant.

Similarly, Callimorpha dominula (L.) and Euplagia quadripunctaria Poda also prove to be common, sometimes very common. According to our observations over the past 40 years, their numbers have not dropped in the least. Still another Red Data Book taxon, Axiopoena maura (Eichwald), currently understood as two distinct species, is common south of the northern range limit. Though the latter lies in the former Soviet Union, this tiger moth is pretty common and easily attracted by light traps in Turkmenistan and Transcaucasia in places where open rock denudations are present.

Like in most cases, the principal factor endangering the existence of these moths is man’s economic activities, in particular, the application of chemicals. Fortunately, as all above species live totally or mainly beyond the places of active economic development, nothing really threatens them.

Among tiger moths, only few agri- and silvicultural pests are known. The most dangerous among these is the American white moth, or the fall webworm Hyphantria cunea (Drury), introduced from North America. This species seems one of the most omnivorous amongst pest insects, the larvae estimated as feeding on 636 plants worldwide. This number appears to be higher than the known records of the gypsy moth, Oeconomia dispar (L.) (Lymantriidae). The gypsy moth seems to be limited by secondary plant metabolites but feeds on plants containing tannins. This factor does not seem to restrict the fall webworm.

The following main acronyms have been accepted:
ab. – aberration
Engl. – English
f. – form
Fr. – French
fw – forewing
Germ. – German
Gr. – Greek
hw – hindwing
In the present contribution, the nomenclature accepted in Zaguljaev et al. (1981) is used.
II. General part

The Arctiidae belongs to a group of families constituting the superfamily Noctuoidea, suborder Ditrisia. Usually arctiids are placed between the families Lithosiidae and Hypsidae or between Lithosiidae and Lymantriidae.

Up to now there are no universally shared views concerning arctiid higher or generic classification. Some authors accept the family in a very broad sense, incorporating therein a lot of what we believe to actually represent independent groups of comparable rank. For example, Heppner (1998) has proposed the following arrangement in this family, which also includes Ctenuchinae as a subordinate taxon.

- Family Arctiidae
  - Subfamily Pericopininae
  - Tribe Pericopina
  - Subfamily Arctiininae
    - Tribe Lithosiina
    - Tribe Aretiina
      - Subfamily Ctenuchininae
        - Tribe Ctenuchina
        - Tribe Syntomina

Recent progress in the higher systematics of Lepidoptera that puts emphasis on the anatomy and structure of the muscular genital apparatus of the male (Kuznetsov & Stekolnikov, 2001) provides only few changes concerning the classification and assignment of Arctiidae.

- Series Noctuiformes Latreille, 1809
  - Superfamily Notodontoidea Stephens, 1829
    - Family Doidae Donahue & Brown, 1987
    - Family Notodontidae Stephens, 1829
      - Superfamily Noctuoidea Latreille, 1809
        - Family Lymantriidae Hampson, 1893
        - Family Aganaidae Boisduval, 1833
        - Family Arctiidae Leach, 1815
          - Subfamily Lithosiinae Billberg, 1820
          - Subfamily Thyretinae Kiriakoff, 1990
          - Subfamily Aretiinae Leach, 1815
          - Subfamily Nyctemerinae Seitz, 1913

In the present work, the family is regarded as fully corresponding to the subfamily Aretiinae in the sense of Heppner (1998) as well as of Kuznetsov & Stekolnikov (2001).

In general, the classification of the tiger moths, which has undergone several attempts at a revision, can hardly be considered as final. Pinhey (1979), for example, divided the Arctiidae into three subfamilies, Lithosiinae, Aretiinae, and Nyctemerinae, while the tribe Micrarctiini, where that author also placed the genus *Phragmatobia* Steph., was referred to Lithosiinae. Both Callimorphini and Spilosomini (recte: Spilosomatini) were assigned to the subfamily Aretiinae.

In the present paper, the Lithosiidae is considered as a separate family, i.e. following, for example, Gershenson et al. (1981), while the scope of the Arctiidae is being accepted according to the recent works of Ferguson (1984) and Dubatolov (1987, 1990a).

Arctiidae can be characterised by the following combination of traits. Eyes mostly bare. In contrast to the close families Nolidae and Lithosiidae, additional simple ocelli present (Fig. 1), proboscis often abortive. Frenulum present (Fm, Fig. 2). On fws, vein M2 close to M3 at base (Fig. 2); on hws, group Se+R1 beginning at different points in radial
sector, depending on the genus. On fws, A3 at base of wings not merging with A2 (in distinction from Noctuidae, in which the extent of coalescence of veins is less, and A2 is with a fork)\(^1\). Tympanic organs present, metathoracic, opening towards base of abdomen. Antennae of males largely but not always comb-like.

A key to the families deemed the closest to the tiger moths and included in the superfamily Noctuoidea is given below. This key does not hold for wingless females only, in which the systematics is not developed as yet. No genitalic characters appear necessary for family-level delimitations.

**Superfamily Noctuoidea**

A large, compact, apparently homogeneous group encompassing a few highly important moth families, including the family Noctuidae.

1. On hw, Sc+R1 missing, coinciding with R. Abdomen usually striate. Some of the moths resembling wasps. .............. \[Ctenuchidae\]
   \[\text{–} \text{On hw, Sc+R1 separated from R at least beyond discoidal cell.} \] ................................. 2
2. On hws, M2 arising closer to M3 than to M1. ........................................................................................................ 3
   \[\text{–} \text{On hws, M2 arising not closer to M3 than to M1.} \] ................................. 3
3. On hws, Sc sharply set off from R at base and then bridged with R over a short interval about the middle of cell, or connected with R by vein R1 at about the middle of cell. ................................. 4
   \[\text{–} \text{On hws, Sc not sharply set off from R at base, approaching there closely to R and then merging with R over a short interval, or paired with R from base up to the middle of cell, or even further.} \] ................................. 5
4. Proboscis abortive or missing. Palpi usually short. Ocelli absent. Veins 1A+2A on fw without basal fork. Female abdomen with a stout bunch of hairs at the end. ................................. \[Lymantriidae\]
   \[\text{–} \text{Proboscis well-developed, labial palps long. Ocelli present. IA + 2A on fw forming a basal fork. Female abdomen without compact tuft at the end.} \] ................................. \[Hypsididae\] (absent from the fauna of the former Soviet Union)
5. Sc+R1 of hw approaching R near base, then merging with R over a short interval but not beyond 1/3 cell; SA+R1 not inflated at base. ................................. \[Noctuidae\]
   \[\text{–} \text{On hw, Sc+R1 paired with R from base up to the middle of cell, or further; or if Sc+R1 separated from R about base and then merged with R up to 1/3 cell, then Sc+R1 inflated at base.} \] ................................. 6
6. Ocelli absent. ....................................................................................................................................................... 7
   \[\text{–} \text{Ocelli present (Fig. 1).} \] ................................. 7
7. Very small moths with triangular grayish fw characterised by areas of elevated scales. ................................. \[Nolidae\]
   \[\text{–} \text{Larger, usually narrow-winged moths with a slender abdomen, but without elevated scales.} \] ................................. \[Lithosiidae\]
8. Labial palps not long. On hws, Sc+R1 swollen at base where merged with R. Usually broad-winged, robust, with dots over body. Fw frequently without areole. ................................. \[Arctiidae\] (part)
   \[\text{–} \text{Fws with an areole.} \] ................................. \[Arctiidae\] (part), \[Nycterimeridae\] (absent from the fauna of the former Soviet Union)

\[^1\text{See Sotavalta, 1964: 1-42.}\]
Division of the tiger moths into subfamilies is based on the conformation of the male genital apparatus. A key to the subfamilies of Arctiidae is given below after Dubatolov (1990a).

1. Ventral edge of valves at apex of sacculus with a **membranous** part, usually even with a process termed “brachiola” (Fig. 6). .............................................................. Callimorphinae

−. Ventral edge of valves at apex of sacculus **sclerotised**. ................................................................. 2

2. Valve oval, strongly concave, declinate inside at edges, with a slender process at apex. Bases of transtillas with clear sclerotised basal processes termed “peniculus” (Fig. 5)............................................................... Arctiinae

3. Valves short and broad, less than 2.5 times as long as wide, often with a process at costal edge. .......... Micrarctiinae

−. Valves long, 3 or more times as long as wide, with fingers or benches at ventral edge (Fig. 4). ........ Spilosomatinae

The following genera have been included into the subfamilies:

I. **Callimorphinae**:

II. **Arctiinae**:

III. **Micrarctiinae**:

IV. **Spilosomatinae**:

The following key to arctiid genera occurring over the territory of the former Soviet Union can be proposed.

1. Vein M2 on hw absent; 5 veins but Sc originating from discoidal cell; moth medium-sized, alar expanse ≥ 32 mm, body slender

   − Vein M2 on hw present though sometimes not quite well-developed, 6 veins but Sc originating from discoidal cell

   2. Vein M2 on hw present; 5 veins but Sc originating from discoidal cell

Fig. 4. Male genitalia of *Phragmatobia fuliginosa* (L.) (Subfamily Spilosomatinae).

Fig. 5. Male genitalia of *Arctia caja* L. (Subfamily Arctiinae).
2. Fws yellow with black longitudinal strokes
   - Fws white with dark strips and spots

3. Areole (= additional cell) on fw present
   - Areole on fw absent
4. Only one areole
   - Two areoles on fw, latter white with a number of red and black spots; male antennae simple
5. R2 on fw branching from R1 and then merging with joint stalk R3-5, forming an areole. Fw black-brown with a red longitudinal band along costal edge; male antennae simple
   - R2 branching from discoidal cell, pattern on fw different or absent
6. R2 connected with joint stalk R3-5, creating a thin areole
   - R2 not connected so
7. Sc of hw merging with R at a distance less than 1/3 of its extent
   - Sc of hw merging with R at least at 1/3 or more of its extent
8. Hind edge of fw dark, sometimes a semi-oval spot in basal part present
   - A white band on hind edge of fw
9. Two large spots along hind edge of fw above vein A1 or two transverse belts across fw
   - Four spots along hind edge of fw above vein 1
10. Areole originating from connection of stalk R2- R4 with R5; fw dusty gray with yellow unclear spots or fasciae, often degraded; hw yellow or whitish with a black discal spot; R and M1 starting from one point at apex of discoidal cell; Pamirs, Tian-Shan
   - Areole originating from connection of stalk R2-R3 with R4; anal angle of male hw carrying a process with a black point
11. R2 of fw starting from discoidal cell and separated from R3; R3-R4 stalked, R5 beginning from low apex of radial-cubital cell
   - Fw with veins R3-R5 stalked
12. Areole originating from connection of stalk R3-R5 with R2; M3 and Cu1 on hw beginning nearly from one point; fw black with white lines, latter forming an X-shaped pattern in outer part; spurs on tibia long; hw highly polymorphous in basic coloration
   - M3 and Cu1 on hw starting from discoidal cell at a distance greater than interval between base of M2 and M3; spurs on tibia short

13. Moths large-sized, alar expase more than 60 mm; fws rather wide, black, with a number of white spots of different size and shape; a small discal spot yellow; hw yellow with black spots; abdomen yellow with black rings

Spiris Transtilla of male genitalia with a strongly chitinised process, uncus concave at apex
Coscinia Transtilla of male genitalia without process, uncus slender and slightly expanded at apex
4 Utetheisa, Tyria, Euplagia, Callimorpha, Eucallimorpha, Carcinopyga, Argyna
13
5 Utetheisa Uncus of male genitalia tapering at apex, without lamellae
Tyria (T. jacobaeus)

Euplagia Callimorpha

Eucallimorpha Carcinopyga

Argyna China

Parasemia Moths medium-sized (alar expase 35 mm), abdomen slender; male genitalia: juxta rather narrow and asymmetrical, ventral portion of aedaeagus with numerous short spines
Arctia Uncus of male genitalia tapering at apex, without lamellae; sacculus without finger
Aglaomorpha histrio Male genitalia with costal process of valva developed
– Alar expanse less than 60 mm
14. R1-5 of fw on a stalk
– Fw R1 starting from discoidal cell
15. Fw R2-5 stalked; R1 starting from discoidal cell
– Fw with R3-R5 stalked; R1 and R2 starting from discoidal cell
16. Fws dark with white longitudinal lines on veins and one sinuous transverse line in outer part of fw

– Pattern on fw different
17. Both wings yellowish white; male fw with dark brown spots; hw without spots; female wingless
– Dark spots on fw weakly expressed, pale, often placed diagonally from apex of fw to middle of hind edge

18. Fore tibia with a curved apical claw
– Fore tibia without curved apical claw
19. Eyes hairy
– Eyes smooth
20. M2 on hw abortive (short); medial spurs on hind tibia absent

– M2 on hw normal

21. Eyes small, oval, each placed on a bare underblinker sclerite
– Eyes major, hemispherical, not placed on a bare underblinker sclerite
22. Male antennae two-combed; fw red-brown with transverse light fasciae and spots; veins not infuscate
– Male antennae simple or dentate
23. Male antennae simple with sparse black and white hairs; black hairs slightly shorter than diameter of antenna; fw black with a light band along costal edge, hw red or yellow

– Male antennae dentate
24. Fw dark gray with numerous, light, diffused spots; basal part of hw dark
– Pattern on fw as wide infuscation along veins; male antennae dentate

26. Fw violet brown with a pattern of yellow maculae
– Coloration and pattern different

14
Andala
15
Spilosoma, Lacydes
16 Grammia, Divarctia, Lemyra, Eucharia
Grammia  Tegumen of male genitalia shorter than uncus, juxta nearly crescentiform in ventral view, aedoeagus short and stout
17
Divarctia (D. diva)
Lemyra  Male genitalia: dorsum long and narrow, triangular in shape, uncus long, valve with a tripartite process/projection, aedoeagus with 1-2 groups of numerous long spines of cornuti

18
Hylphantria
19
20
Hylphoraia  Male genitalia valva with one apical process only
Sibirarctia  Valva of male genitalia with three apical dentiform processes
22
26
Pararctia
23
Oroncus  Hind tibia with 2 pairs of spurs, medial with one; probosces present, underdeveloped; eyes oval, placed on sclerites devoid of scales; palp stout, directed forward; femora covered with red hairs from above
24
Acerbia
Borearctia  Male genitalia: peniculus long, 3-4 times longer than wide
Platarctia
27
27. Thorax clothed with woolly hairs
   - Thorax smoothly scaled
28. Moths large, alar expanse 70-200 mm
   - Moths small to medium-sized, alar expanse less than 40 mm; wings gray
29. Antennae simple
   - Antennae pinnate

30. Alar expanse less than 100 mm
   - Alar expanse greater than 150 mm; main colour of fw black without spots; hw black with a crimson basal part; hind tibia with two pairs of short spurs
31. Fw dark
   - Fw yellow or cream-coloured with black spots

32. Fw with five transverse bands
   - Less than five transverse belts or pattern on fw different
33. Fw gray with dark spots or dark with three lighter bands; female with short wings
   - Wings of female normal
34. Fw with four transverse bands
   - Only one unbroken transverse band on fw, or transverse bands absent
35. Fw pink with a wide, dark brown, unbroken, transverse band in the middle of wing; submarginal band interrupted between R5 and Cu1; external edge of fw lighter; hw pink with a spot on discal vein and two marginal light brown spots
   - Transverse bands absent.
36. Fw black with light longitudinal stripes
   - Fw without pattern of lines or large spots; only short strips or points can be present
37. Fw and hw of different colour
   - Fw and hw of same colour
38. Fw brown with black or red discal spots; hw crimson with a dark belt or row of spots at edge
   - Fw and hw uniform dark gray or black, except for a yellow anal part of hw

39. Background coloration of fw and hw same
   - Coloration of fws and hws different
40. Background colour ochre orange with black spots
   - Coloration entirely uniform
41. Dusting thin; wings slightly translucent; male wings white or brown, female white
   – Dusting dense
42. Males and female wings of same brown colour with dark points; Central Asia

   – Coloration yellow (pale yellow) or white
43. Coloration yellow (pale yellow)
   – Coloration white
44. Fw of male yellow with a single spot on discal vein; hw of same colour (slightly lighter), with marginal and, sometimes, discal spots; female darker, with more strongly developed dark spots on hw; basal part dark

   – Fw pale yellow with brownish or black patches; veins yellow; antennae two-combed
45. Wings white, usually without spots except for a dark discal vein on hw; abdomen white with red (yellow) and black spots; femora bright red (yellow)
   – Wings white, usually with black spots; abdomen yellow or red with black spots; femora black or white
46. Fw yellow or yellowish brown, hw usually crimson

   – Hw usually ochre yellow; acetegite of tegumen of male genitalia very well-developed, its subdorsal portion strongly expanded; lateral membranous area of abdominal segment 8 bearing a pair of valve-like secondary sclerites
47 Male genitalia: juxta semi-oval with numerous minute denticles on distal 1/2, aedaeagus strongly curved, valva with a semicircular process bearing numerous denticles
   – Male genitalia: juxta nearly rectangular with short denticles laterally in its apical 1/4-1/3, aedaeagus with minute spinules in apical portion

Diaphora
42
Eudiaaphora Male genitalia: uncus broad, trigonal, valve straight, not furcate at apex
43
44
45
Diacrisia Male genitalia: juxta nearly rectangular, with a membranous area on its median portion in ventral view, no spinules
Alphaea Male genitalia: tegumen with small postero-subventral projections
Spilosoma Valvae very long
Chionarcia Valvae moderately elongated
47 Rhyparia, Rhyparioides (differ in genitalia only)
Spilarctia

The Arctiidae is a cosmopolitan family with about 10,000 species, mainly in the tropics. In the Palaearctic, about 350 species are known, of which ~100 are encountered in the fauna of the former Soviet Union. Rather peculiar groups of tiger moths appear to be high-montane and/or Arctic, e.g. in the genera Dodia, Oroncus, Pararctia, Orontobia etc. Some of these are circumpolar in distribution, e.g. Dodia and Pararctia.

Fig. 6. Male genitalia of Coscinia cribaria (L.) (Subfamily Callimorphinae) (after Dubatolov 1990d).
Vladimir Murzin

The family name derives from the shaggy, often brown, bear cub-like larva, or caterpillar (from the Greek “arktoz”, meaning “bear”). In English these are named “woolly bears”. The so looking caterpillars occur on some tussocks, in particular *Gynaephora* spp., with protruding glands on body segments 7 and 8.

The larvae feed on various herbaceous plants, less often arboreal ones, sometimes damaging crops. Some are inclined to preying on others. The American white moth, *Hyphantria cunea*, is a serious pest of garden and park cultures generally distributed in the southwest of the former Soviet Union, but potentially dangerous for other parts of European Russia. Larvae of many tiger moths prove to acquire toxicants, e.g. histamines and alkaloids, from their host plants. Others fabricate similar poisons by themselves. For this reason, many of the tiger moths become inedible to predators. In addition, usually they are brightly coloured, of a warning, aposematic coloration.

The patterns on the wings are manifold. In search of some regularities in these patterns, Sokolov (1936) (Fig. 8) offered a system, including the following lines: external (E3), medial lines M1 and M2, discal D1 and basal In, and also boundary and medial umbras. The pattern on the wings in tiger moths was also considered by Ferguson (1984). However, in each particular case finding these elements is difficult enough because of the numerous facts of their reduction, coalescence, shift or segmentation.

The existing patterns on the wings of tiger moths can be reduced to those observed in several reference lineages.

I. Type I
The pattern of the first type consists of a series of bands intersecting the wing in longitudinal and transverse directions (Fig. 9).

Tr1 (transversa No. 1), a short band beginning at the costal edge or apex of the wing and sometimes reaching E1. Tr2, beginning at the costal edge and intersecting band E1; they often compose an X-shaped pattern. Tr3-4 (sometimes Tr5), extending from the costal edge to longitudinal line Ls (longitudinal stroke). The line Ls runs from the base of the wing to the external edge. Sp0-Sp4 (sprouts), approaching the inner edge of Ls.

The pattern is often supplemented by purification of the veins or is reduced as the result of loss of some elements. A similar pattern can be seen in the tiger moth genera *Arctia, Callimorpha, Chelis, Diarpactia, Hyperborea, Oenogyna, Palearctia, Pararctia* and *Parasemia*. Fig. 7. Tajikistan, Khorog, Botanical Garden, place of flight of *Eucallimorpha fedtschenkoi* Gr.-Gr. (photo by V. S. Murzin).
Fig. 8. Prototypic pattern in tiger moths (after Sokolov, 1936): E3 – externae, M – mediana, D – discalis, B – basalis, mU – umbra medialis.

Fig. 9. The patterns of fw in the tiger moths of Europe and northern Asia. I – Type I pattern, the most common. Band EI [external (E) – inner (I)] present, an arcuate band running from the middle of the external edge to the inner edge. II A, II B, II C and III – other types of pattern.
II. Type II: Fws are monochromous.
   A. Fws with separate spots or points: Spilosoma, Spilarctia;
   B. Fws with separate longitudinal bands: Oroncus, Orontobia, Spiris;
   C. Fws without pattern: Dotia, Epymodylia, Phragmatobia.

Type III: Fws with 4-6 transverse bands: Carcinopyga, Rhyparia, Rhyparioides, Gonerda, Euplagia, Acerbia, Eucharria.

Most of the species of our tiger moths display a pattern on the wings of type I. Type III is the closest to the initial pattern, as suggested by Sokolov.

Many species of tiger moths show considerable geographical and individual variability. In this connection, a number of forms, aberrations and subspecies have been described. All such modifications will be referred to as “forms” (f.) or “aberrations” (ab.). In contrast, geographically stable forms will be termed as subspecies (ssp.), though the degree of difference of similar forms from the typical one is not always appreciable.

Individual variability often arises as a result of environmental impacts, for example, under the influence of abnormal temperatures affecting some preimaginal stages of development. Most of the strongest modifications appear due to this cause, yet there are genetically determined forms as well. Rather often the red colour on the hws is changed to yellow or white, or vice versa. Such modifications occur in many species, for example, in the common Aretia coja L., the rib-grass tiger moths Callimorpha dominula, Palearkitia glaphyra Ev., etc., all forming parallel series of forms devoid of geographical patterns.

The biology of numerous tiger moth species is still poorly-known. Most of these moths fly at night, but there are also diurnal examples, e.g., such high-mountainous species as Oroncus tancreli Stgr. and Palearkitia glaphyra volant in the middle of day, or P. erschoffi Alph. appearing closer to the evening and volant up to the sunset. The same diurnal habits also concern subpolar species. Many tiger moths do not fly in the daytime, but are easy to spot in grass where they hide, e.g., Diacrisia sannio (L.), Parasemia plantaginis (L.), etc.

The mechanisms of defense in this family include certain types of behaviour that involve exposing the various highly coloured body parts. Thus, many species roll on their sides to reveal their bright abdomen. Other species, for example, Uetheisa, secrete a stinking acidic froth from their prothoracic glands or play dead.

An aposematic coloration is a very distinctive feature of this family, the garden tiger moth Aretia coja being only one example, as are both Mullerian and Batesian mimicry. A profound study of this phenomenon has been carried out by M. Rothschild (cited after Sbordoni & Forestiero, 1988: 153) using two Palaeartic species of Spilosoma, one of which, S. lubricipedum (L.), is poisonous and acts as model for the other, S. lutea (Hfng.), which is quite edible. Superficially, these two species are very difficult to distinguish.

There is information that tiger moths active at night are capable of sensing the ultrasonic signals of bats and save themselves by sharply veering the flight or even falling to the ground. In the American tiger moth Pyrhracia isabella (Smith, 1797) (Plate 24, Fig. 9), the existence of an “ultrasonic mimicry” has been revealed. In this case, the moth itself emits ultrasonic signals or “metal” notes of high frequency (Blest et al., 1963; Blest, 1964). As shown by Dunning, such signals are induced to stop or prevent a bat attack (Sbordoni & Forestiero, 1985). Actually, this tiger moth imitates the signals of other moth species that possess some means of chemical defence while the signals serve to warn and repel the bat.

Since 1983, the tympanic organ of Empyreuma affinis (Rothschild, 1912) has been studied intensively using acoustic stimuli of varying duration, from 3.5 ms to 5 s, without knowing for certain the behavioural significance of audition in this species. Both physiological and behavioural results suggested strongly that this species could use sound during its mating. Recently, strong sexual dimorphism, including the duration and repetition rate of the modulation cycles, has been demonstrated by recording both in field and wind-tunnel conditions the acoustic signals emitted by males and females (Dawson & Fullard, 1995).

Some experiments have been performed to understand the way of production of ultrasound by tiger moths. Certain Arctiidae have been shown to generate trains of high-frequency clicks from specialised structures (tymbals) on their thorax.

When stimulated either acoustically or actually, many species of arctiid moths rhythmically emit trains of clicks from metathoracic tymbals. Fullard & Dawson (1995) have tried to determine the location within the central nervous system (CNS) of the presumed tymbal central pattern generator (CPG) in Cycnia tenera tenera Hänber, 1818. Motor neuron impulses that underlie tymbal activation have been recorded extracellularly from the tymbal nerve while moths have been subjected to selective severing of the sub-oesophageal, prothoracic, pterothoracic and abdominal ganglia connectives. Motor output evoked by either acoustic or tactile stimulation originates from a common CPG because...
tymbal nerve spikes in both cases are similar in amplitude, wave form and rhythmicity. The results show that (1) removal of the head decreased the responsiveness of the animal to acoustic stimulation; (2) severing the connectives between the prothoracic and pterothoracic ganglia abolished responses to acoustic stimuli and diminished responses to tactile stimuli. It has been concluded that although the minimal circuitry sufficient for activating the tymbals resides in the pterothoracic ganglion, the prothoracic and cephalic ganglia are required for the normal and, in particular, auditory-evoked operation of the tymbal CPG.

Assuming that bat detection is the primary function of moth ears, the ears of moths that are no longer exposed to bats should be deaf to echolocation call frequencies. To test this, Fullard et al. (1997) compared the auditory threshold curves of 7 species of Venezuelan day-flying moths (Notodontidae: Dioptinae) to those of 12 sympatric species of nocturnal moths (Notodontidae (Dudusinae), Noctuidae and Arctiidae). Whereas two nocturnal species of dioptines revealed normal ears, two other (day-flying) species had reduced hearing at bat-specific frequencies (20-80 kHz) and the remaining three ones (Thimida sp., Polypoetes sp., and Xenorma sp.) revealed pronounced to complete levels of high-frequency deafness. Although the bat-deaf ears of dioptines could function for other purposes (e.g. social communication), the poor sensitivities of these species even at their best frequencies suggest that these moths represent a state of advanced auditory degeneration brought about by their diurnal life history. The phylogeny of the Notodontidae further suggests that this deafness is a derived condition and not the retention of a primitive, insensitive state.

Although social functions for the sounds have been demonstrated, debate continues on their anti-bat defensive role with aposematism, startle, and/or echolocation disruption being offered as to how the sounds operate. The controversy arises primarily from the near impossibility of observing natural, in-flight behaviour of moths and hunting bats. As a result, most of the experiments attempting to explain the sounds have used indirect methods to infer their actions. These studies include examinations of the structure of the sounds, stimulation of stationary moths with artificial bats, and stimulation of trained, laboratory bats with artificial moths. Other laboratories have attempted to exploit the

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Fig. 10. Turkmenistan, Great Balkhan Mt. Range. Axiopeona maura extremely frequently occurring there (photo by V. S. Murzin).
foraging behaviour of wild bats in controlled conditions. These studies have not yet satisfactorily explained why arctiids talk, but one observation that has become clear is that the defenses of tiger moths, as with most animals, are directed against a variety of predators and that single explanations do not exist for complex behaviours (Coro et al., 1992; Fullard, 1994; Fullard et al., 1997).

It is noteworthy that larvae of *Empyreuma pugione* (Linnaeus, 1767) have been found to be responsive to sounds as well. Larvae respond to low-frequency sounds between 100 and 1000 Hz by either a violent jerking of the anterior half of the body or by the cessation of crawling. The behavioural responsiveness of denuded animals as well as the vibrational resonance of the setae are the sound receptors in this species. The frequency and the behavioural response are consistent with the idea that larvae are sensitive to the wing-beat frequencies of predatory and parasitic wasps. These very interesting observations require further investigations.

The majority of tiger moths hibernate at the stage of a caterpillar, sometimes the very first instar. However, there are species overwintering as the pupa. Some boreal and high-mountainous species can hibernate repeatedly.

A few fossil remains of tiger moths are currently known, in particular the Miocene *Stauropolia nekrutenkoi* Skalski, 1988, described from near Stavropol, North Caucasus and apparently belonging to the subfamily Arctiinae. In general, based on the fact that a highly advanced arctine occurred as early as in the Miocene, Skalski (1988) considered that representatives of Arctiidae could have been relatively common and diverse in the Tertiary of Europe. However, a critical review of fossil Lepidoptera (Kozlov, 1988) questions virtually all previous records of arctiid moths by, e.g., Woodward (1879), Rebel (1898), Kernbach (1967) or Jarzembowski (1980).
III. Special part

Subfamily Callimorphinae

1. Genus Callimorpha Latreille, 1809

Callimorpha Latreille, 1809: 220, TS: Phalaena dominula Linnaeus, 1758
= Phanaeus Tams, 1939: 73, TS: Phalaena dominula Linnaeus, 1758

Size medium, moth slender, wings prolate and brightly pigmented. Areole on fw existing. Proboscis well-developed. Antennae of both sexes simple, with two series of short setae located all along antenna. Eyes large, bare, with a well-marked ophthalmic sclerite. Palps short, bent upwards, coated with accumbent fluffs, with a reduced end segment. Thorax smooth with accumbent scales. Wing pattern of Type I.

Key to species of Callimorpha:
1. Only spots on fw. ................................................................. C. dominula
   –. Only transverse bands on fw. .................................................. C. philippsi

1. Callimorpha dominula (Linnaeus, 1758)

(Pl. 1, Figs 1-5, genitalia Pl. 25, Fig. 1)
Phalaena dominula Linnaeus, 1758, 1: 509, TL: Europe.
[= domina Hübner, 1803; dominula Mann, 1862; insubrica Wackerzapp, 1890; lusitanica Staudinger, 1894; rhodanica Kettlewell, 1943].

[dominula – small mistress (Lat.)]
[Searlet tiger moth – (Engl.)]
[Harequin – (Germ.)]
[Ecaille rouge – (Fr.)]

Kolenati, 1846: 95, Callimorpha rossica
Spuler, 1910, 2: 141, pl. 74, fig 4c, Callimorpha dominula
Seitz, 1913, 2: 101, pl. 18 row e, Callimorpha dominula
Dubatolov, 1996a: 40, Callimorpha dominula

Subspecies:
C. d. dominula (Linnaeus, 1758) (= insubrica Wackerzapp, 1890; rhodanica Kettlewell, 1943)
C. d. rossica Kolenati, 1846 (= dominula hutea Staudinger, 1861: 214)
C. d. teberdina Sheljuzhko, 1934
C. d. szanetica Reich, 1935
C. d. pompadis Nitzsche, (1925) (= italica Standfuss, 1884; majellica Dannehl, 1929)
C. d. bithynica Staudinger, 1871 (= balcanica Daniel, 1951/52)
C. d. kurdistanica Thomas, 1983.

The species is included as threatened in the Red Data Book of the USSR (Borodin, 1984b).
Description. Alar expanse 45-55 mm. Antennae filiform. Fw black with greenish sheen, with rounded or oval yellow to pale yellow spots. Hw pink or carmine red with black marginal spots. Thorax black with greenish sheen and two yellow longitudinal stripes. Abdomen red with a black longitudinal stripe dorsomedially.

Variability. This is a highly variable species. Several dozen individual variations and geographical races have been described. Two subspecies, the nominotypical and the ssp. rossica, are known from the territory of the former Soviet Union. The latter subspecies (Pl. 1, Figs 1-2, 4-5) is distinguishable from the nominotypical one by the brilliant green sheen of the fw and by the yellow background coloration of the hw. However, some rossica populations are known, in which specimens with yellow or carmine red hw coexist (Pl. 1, Figs 4-5). The spots on the fw are almost clearly white. This subspecies is known to occur in the Caucasus and Transcaucasia.

The following forms/varieties can be distinguished:
- f. hamelensis Pflumer, 1879 – fw with partly merged white spots, hw red;
- f. ochromaculata Fuchs, 1890 – fw with ochre yellow spots;
- f. paucinacula Schultz, 1897 – fw uniform brown, almost without spots;
- f. nigra Spuler, 1910 – fw completely black;
- f. radiata Krodel, 1901 – underside of fw with two white stripes starting from base;
- f. bimacula Schultz, 1905 – with two (basal) spots only.

Callimorpha dominula is a classical example of polymorphism. This species is polymorphous at the genetic level for both alleles that control the number of white spots on the fw. The normal homozygote dominula has six main white spots distributed over the whole fw while the rare, also homozygote form bimacula has only two basal spots. If one studies closer the proportion of the different morphs of dominula at one and the same locality in different years, the frequency of occurrence of the forms can be seen as time-dependent. Thus, careful observations made annually in England showed significant variation in the share of the bimacula form. Its frequency rose from around 1 % in 1929 to over 11 % in 1940 and then gradually dropped back to its original level in 1955. In subsequent years, it fluctuated between 0.8 and 4.6%. The causes for this variation have not been clearly identified yet (Sbordoni & Forestiero, 1985).


Within the former Soviet Union. Baltic republics; Belarus; Ukraine, Crimea; Moldova; European Russia up to 60°N (headwaters of Volga River, Nizhnii Novgorod, Ufa, Belaya River, South and Central Urals, Orel, Rostov-on-Don); Caucasus; Transcaucasia; southern Turkmenistan (Kushka).

Beyond the former Soviet Union. Europe (up to southern England and southern Scandinavia in the north, absent from the southern part of the Iberian Peninsula); Turkey; Iraq; Iran, Asia Minor.

Biology. Distribution patchy, often in ecotones, in the daytime in forest glades, at forest edges, etc. Occurring on flowers, e.g., of thistle, knapweeds, etc., or flying from tree to tree, resting in foliage. In many regions, very usual, for example, in Armenia (slopes of Mt. Aragats, Tsav, where the moths sometimes damage fruit-trees), North Caucasus, in the north of Moscow Region, in Lenkoran, Azerbaijan, etc. In the Crimea, it is rare, protected since 1990. Flight in one generation from the beginning of June and in July.

Caterpillar black with dark blue sheen. Thorax with a yellow stria changing in the last instar to yellow-gray maculae. Yellow spots discernible on each side. Fluffs in fasceiles on dark warts, grayish, short. Larvae feeding on

Fig. 11. Callimorpha dominula persona ab.donna Esp (1) and hybrid romanovici Standfuss (2) (after Spuler, 1910).

The modest quality of the illustration is only due to the relatively poor quality of an old original picture.
Cynoglossum, Fragaria, Fraxinus, Geranium, Lamium, Lonicera, Myosotis, Populus, Prunus, Ranunculus, Rubus, Salix, Ulmus, Urtica, etc.

Caterpillars hibernating and pupating in May on the ground among grass. Pupa reddish brown, glossy. Cocoon thin, light, almost white.

This species was an object of manifold experimentation. A strong influence of pupal cooling on adult coloration was detected. Standfuss\(^2\) crossed males of *C. dominula dominula* and females of *C. dominula persona* (Hübner, 1790). He obtained brightly pigmented large moths. Back crossings (female *dominula* and male *persona*) provided a different result, though the caterpillars were reared simultaneously and in identical conditions. This explorer obtained smaller moths with cinnabar and strongly infuscate hws, as observed in the extreme aberration *domina* Esper, 1786. On the whole, the hybrids showed an appearance intermediate between the parents (hybrid *romanovi* Standfuss, 1899) (Fig. 11).

For reasons unknown, this rather common tiger moth was listed as threatened in the Red Data Book of the Soviet Union (Borodin, 1984b).

Similar species. *C. philippsi* Bartel, 1906, differs by the merged maculae on the fws, these maculae forming two transverse bands (Fig. 12).

2. *Callimorpha philippsi* Bartel, 1906

(Fig. 12)

*Callimorpha philippsi* Bartel, 1906: 41, TL: Kusch [= Turkmenistan, Kushka (?)].

[philippsi – after Mr. Philipps (Lat.)]

Seitz, 1910: 101, *Callimorpha philippsi*

Draudt, 1933: 72, *Callimorpha philippsi*

Dubatolov, 1996b: 40, *Callimorpha dominula philippsi*

**Description.** Alar expanse 50-54 mm. Fw black with greenish tint and two transverse white bands. A white point on discal vein. Hw red with black spots as in *C. dominula*. Head and thorax dark, latter with two longitudinal yellow strokes. Abdomen from above orange red, with a series of black points.

**Distribution.** Pattern Transcaucasian (Hyrcanian).

Within the former Soviet Union. Kushka (?), Azerbaijan (Lenkoran). Despite extensive collectings in the region of Kushka (Morgunovka, Badhkyz Nature Reserve), we have failed to find this species.

The natural landscapes in the neighbourhood of Kushka (semidesert, riverine forest, steppe, *Pictacea* “savanna”) differ strikingly from those at Lenkoran (subtropical wet relict forest), where the moth has been refound (Lenkoran, Dashatynk, 19.VI.1984, leg. G. Milander). Therefore, there are doubts concerning the provenance of the type locality as given in the original description.

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2 Cited after Spuler, 1910: 140-141.
Beyond the former Soviet Union. Iran (?).

Similar species. *C. dominula* has on fw separate light spots, instead of bands.

### 2. Genus *Euplagia* Hübner, 1820

*Euplagia* Hübner, 1820: 180, TS: *Phalaena hera* Linnaeus, 1767 (= *quadripunctaria* Poda, 1761)

Antenna of male and female simple, in male with short aciculae all along; proboscis developed. Head large, palpi very long, reaching to middle of eye, directed upwards. Fw opaque, pattern consisting of oblique straight lines directed across and along the wing; back edge of wing widely clarified. Wing pattern of Type I.

### 3. *Euplagia quadripunctaria* (Poda, 1761)

(Pl. 1, Figs 6-7; genitalia in Pl. 25, Fig. 2)


[= *hera* Linnaeus, 1767; *plataginis* Scopoli, 1763; *lutescens* Staudinger, 1901; *magna* Spuler, 1910; *latefasciata* Bubacek, 1915]

(Oberthür, 1896: 56, pl. 10, fig. 174, *Callimorpha hera fulgida*

Spuler, 1906: 141, pl. 74, fig. 8, *Callimorpha quadripunctaria*

Seitz, 1910: 101, pl. 18, row f, *Callimorpha quadripunctaria*

Daniel, 1953, *Euplagia quadripunctaria rhodosensis*

Dubatolov, 1996b: 41, *Callimorpha quadripunctaria*

Subspecies:

*E. q. fulgida* Oberthür, 1896.

Fig. 13. *Euplagia quadripunctaria* (Poda), ♂. Armenia, Mt. Aragats, Nor-Amberd, 2000 m, 12.IX.1971 (photo by V. S. Murzin).
**Description.** Alar expanse 50 mm. Fw black with white striae. Hind edge of fw white. A white, downward narrowed line 5-7 mm in length extending from base of fw to back edge. A white stria beginning at costal edge of fw ca.1/3 extent off its base and directed towards back angle. One more stria stretching from costal edge to outside and merging with still another white stria passing parallel to external edge. Back angle of fw with a white field formed by additional, white, longitudinal, short lines, with a black round spot and 1-3 black points. Hw red from above, with a black round spot at centre and two submarginal maculae. Underside of fw and hw with basal parts red orange with a black spot, apex of both wings light. A black field between two median belts. Hw red orange with one submarginal black spot.

**Variability.** This species is highly variable both in individual size and coloration.

The following subspecies or forms are known from the former Soviet Union.

- ssp. *quadripunctaria* – European part;
- ssp. *fulgida* – this very large form with magnificent red-coloured hws and enlarged black maculae is distributed in the southern part of its geographical range: southern Turkmenistan, Transcaucasia, northern Iran, Turkey, Syria;
- *l. lutescens* Staudinger – hw yellow;
- *l. latefasciata* Bubacek – hw orange yellow.

**Distribution.** Pattern Euro-Caucasian.

Within the former Soviet Union. Baltia (Lithuania, Latvia); Belarus; Ukraine, Crimea; Moldova; European Russia, up to the Leningrad Region in the north, midflow region of Volga River, southern Ural; Caucasus; Transcaucasia; southern Turkmenistan (Kopetdag Mts).

Beyond the former Soviet Union. Southern and Middle Europe, up to southern England in the north (except for the North Sea and Baltic coasts of Europe); Turkey; Syria; northern Iran.

**Biology.** Flight in August to September, can often be seen feeding on flowers. Caterpillar gray-brown or black with yellow orange hairs. A bright orange stria all along body. Each segment with 4 yellow warts with black edges. Sides with a light, neat, longitudinal band accompanied from above and on underside with warts. Last-instar caterpillar up to 55 mm in length. Larvae feeding on various herbaceous or partly woody plants (*Lamium, Epilobium, Corylus, Rubus, Lonicera, Sarothamnus*), hibernating.

For reasons unknown, this species was included in the Red Data Book of the USSR (Borodin, 1984b).

**Similar species.** *E. splendidior* (Tams, 1922), differs by the bright silky sheen of the fws and the larger size.

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4. **Euplagia splendidior** (Tams, 1922)

(Pl. 2, Fig. 1)


[*= quadripunctaria tkatshukovi* Sheljuzhko, 1935a]

[splendidior – more gorgeous (Lat.)]

Wiltshire, 1957: 51, pl. 1, fig. 1, *Callimorpha splendidior*

Dubatolov, 1996b: 41, *Euplagia splendidior*

**Description.** Alar expanse 55-60 mm. Pattern very similar to that of fw of *E. quadripunctaria*, but coloration of fw differing by brightly green silky glitter. Specimens from Armenia available to us showing a narrow white line extending from base of fw parallel to hind edge up to a white field in outer corner. In *E. quadripunctaria*, this line reduced closer than middle of fw. Underside coloration more saturated by red orange tint than in *E. quadripunctaria*.

**Distribution.** Pattern Anatolian-Iranian.

Within the former Soviet Union. southern Transcaucasia: Armenia (southern slopes of Mt. Aragats), Azerbaijan (Nakhichevan).

Beyond the former Soviet Union. Eastern Turkey; northern Iraq (Zagros Mts) [Wiltshire, 1957]; western Iran.

**Biology.** Flight in July at elevations about 1900-2000 m a.s.l., in sparse woodlands resting on tree trunks. Few records in Armenia (Collections of Tsvetaev of 1936 and 1974, and of Murzin of 1962). According to Wiltshire (1957), “The food plants are low plants in places, where there are trees”.

**Similar species.** *E. quadripunctaria*, differs by the smaller size and the lack of metallic gleam of the fw.
Notes. This taxon is sometimes considered as a subspecies of the previous species. However, on the slopes of Aragats Mountains in Armenia, both *E. quadripunctaria* and *E. splendidior* can co-occur in one and the same place. Yet the time of flight is a little different there, with *E. quadripunctaria* flying from mid-August to the end of September.


*Eucallimorpha* Dubatolov, 1990c: 99, TS: *Callimorpha principalis fedtschenkoi* Grum-Grshimailo, 1902

Dubatolov (1990c) has established the genus based on some singular traits of male genitalic structure as well as the original external appearance.

Note. Dubatolov (1990c) also refers *E. equitalis* (Daniel, 1943) (Pl. 2, Fig. 2), from the Himalaya and some adjacent parts of China and India, to the same genus. Some further congeners among the Palaearctic taxa seem to be as follows: *Eucallimorpha similis* Moore, 1879a, from Nepal, *E. albipuncta* Wileman, 1910, *E. arizona* Matsumura, 1911, both from Taiwan, *E. lenzeni* Daniel, 1943a, from Yunnan, China, *E. nyctemerata* Moore, 1879a, *E. nephos* from Sichuan (Leech, 1899), Yunnan (Daniel, 1943; Fang, 1982, 1985) and Tibet (Fang, 2000), and *E. ochricolor* Alpheraky, 1897, from Sichuan.

There is a single species in the former Soviet Union. Its identification causes no difficulties.

5. *Eucallimorpha principalis* (Kollar, 1844)

*Euprepia principalis* Kollar, 1844: 465, pl. 20, fig. 2, TL: Kashmir.

[principalis – principal (Lat.)]

Grum-Grshimailo, 1902: 197, *Callimorpha fedtschenkoi*
Seitz, 1910: 102, pl.18, row g, *Callimorpha principalis*
Seitz, 1910: 102, *Callimorpha principalis fedtschenkoi*
Seitz, 1910: 102, *Callimorpha principalis regalis*
Draudt, 1931: 281, *Callimorpha principalis ladakensis*
Daniel, 1943a: 247, pl. 13, *Callimorpha equitalis*
Kishida, 1992: 72, *Callimorpha principalis f. equitalis*
Kishida, 1993: 66, pl. 79, fig. 4, *Callimorpha principalis*
Dubatolov, 1996b: 41, *Eucallimorpha principalis*
Fang Chenglai, 2000: 463, *Callimorpha principalis*

Subspecies:
*E. p. fedtschenkoi* (Grum-Grshimailo, 1902) ( genitalia in Pl. 25, Fig. 3)
*E. p. ladakensis* (Reich, 1933): 234
*E. p. regalis* (Leech, 1889): 125.

Description. Alar expanse 75-80 mm. Fw dark with green lustre and small rounded or elongate yellow or white maculae. Hw yellow with well-marked black dusting on veins and several black maculae sometimes merged in a submarginal belt.

Variability. The typical form is distributed in the Himalaya. From Khorog, Pamirs, Tajikistan, the ssp. *fedtschenkoi* (Pl. 2, Figs 5-6) has been described as being smaller (60-70 mm), with bright green sheen on fw. Spots on fw lighter, hw light yellow, black dusting on veins almost completely missing. Only a black spot retained on discal vein as well as a series of transversely elongate submarginal maculae along outer edge of hw, and a black line between veins M3 and Cu1. Abdomen red with black points on dorsal side.

The following subspecies are known from the adjacent territories:

- ssp. *ladakensis* – fw dark green with weak metallic lustre, spots white with weak yellowish tint; hws bright, yellow orange; black spots weakly expressed, veins devoid of black dusting; abdomen red without black maculae. Ladak, Tibet, 3700 m a.s.l., July;
ssp. regalis – more often larger and lighter; China, i.e. Zhejiang, Jiangxi, Sichuan, Shaanxi, Hubei, Hunan, Fujian (Fang, 2000).

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Pamirs (Khorog, Barvaz).

Beyond the former Soviet Union. Himalaya (Kashmir), China: Yunan (Tiger Leaping Gorge, Haba Mts, Zhongdian), Sichuan, Shaanxi, Hubei, Hunan, Fujian, Ladak (Tibet), northern Nepal (Mt. Annapurna).

**Biology.** Flight in July at elevations from 2000 m a.s.l. (Khorog, Pamirs) (Barvaz tract in Shakhdara Valley, 2800 m a.s.l.) up to 4200 m a.s.l. (Nepal, Annapurna), nocturnal. In the daytime, moths resting on the upper side of leaves in trees and shrubs, whence easily flushed.

**Similar species.** E. equitalis, from Nepal, is a little larger (up to 73-75 mm), hw white with a weakly expressed dark pattern. Abdomen from above black, underside white with a black reticulate pattern, red on each side.

### Genus Aglaomorpha Kôda, 1987


= Neocallimorpha Dubatolov, 1990e: 100, fig 8, TS: Hypercompa histrio Walker, 1855

Fw dark with white, oval or angulated spots. Hind edge of fw not clarified. Veins on hw not infuscate. Head and palps small, latter a little longer than head pilosity. Genitalia: Male uncus short, rather stout, pointed at apex, sacculus deeply cut longitudinally, its extremities of different form. Ventral process of valves (brachiola) membraniform, well-developed. Aedaeagus rather short, stout, without cornuti. Female ostium much wider than sexual papillae, signa on bursa elongate transversely (see description of Neocallimorpha by Dubatolov (1990e)).

**Note.** Aglaomorpha plagiarata (Walker, 1855), from China and Nepal, belongs to this genus.

### Aglaomorpha histrio (Walker, 1855)

(Pl. 3, Fig. 1; genitalia in Pl. 25, Fig. 4).


[histrio – actress (Lat.)]

Seitz, 1910: 102, pl. 18, row g, *Collimorpha histrio*

Draudt, 1931: 281, *Collimorpha histrio*

Wang et al., 1983: 225, fig. 1654, *Collimorpha histrio*

**Description.** Alar expanse 72-76 mm. Fw black with numerous oval or angulated white and yellowish spots. Hw yellow with large black maculae. Abdomen yellow with a series of black lateral points and both dorsal and abdominal transverse strokes. Head black, epicranium yellow. Patagia black; thorax yellow with two large longitudinal maculae. Antennae simple.

**Variability.** Individual variation modest.

Two subspecies are known as verified:

- **ssp. coreana** Matsumura, 1927 (= chosensis Bryk, 1949) – Korea
- **ssp. formosana** Miyake, 1911 – Taiwan.

**Distribution.** Pattern East Asian.

Within the former Soviet Union. Not known, though an encounter in the south of Primorye, Russian Far East seems possible.

Beyond the former Soviet Union. North and South Korea (Sinpkho, Pyongyang) (S. Murzin), China (Taiwan, Sichuan, Gansu, Hubei (Fang, 1982), Yunnan (Fang, 1985)).

**Biology.** Flight in July in woodlands.

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3 Only the genera recorded in the former Soviet Union are numbered.
4 Only the species recorded in the former Soviet Union are numbered.
4. Genus *Cymbalophora* Rambür, 1866

*Cymbalophora* Rambür, 1866: 231 (replacement name for *Tympanophora* Laboulbène, 1865), TS: *Phalaena pudica* Esper, 1784

= *Eyprepia* Ochsenheimer, 1810: 299, TS: *Phalaena caja* Linnaeus, 1758

= *Tympanophora* Laboulbène, 1865: 221, non *Tympanophora* White, 1841 (Orthoptera)

Antennae of male simple. A small accessory cell, or areole, on fw. Veins M2, M3 and Cu1 on fw and hw tightly connivent; starting from virtually one point at hind angle of discal cell. Veins Se and R1 on hw paired with R on a very small field. A large tympanic organ at hind extremity of male thorax.

**Note.** *Cymbalophora pudica* (Esper, 1785), from Southern Europe, as well as several species from North Africa and East Asia belong to this genus. In North America, there are lots of species superficially very similar to the Palaearctic representatives of this genus.

6. *Cymbalophora rivularis* (Ménétriès, 1832)

(Pl. 3, Fig. 7)

*Chelonia rivularis* Ménétriès, 1832: 263, TL: Armenia, Ielenendorf (=Lake Sevan).

[= *dannehli* Turati, 1929; *perversa* Dannehl, 1929; *connexa* Dannehl, 1929]

[rivularis – riverine (Lat.)]

Seitz, 1910: 80, pl. 16, row c, *Eyprepia rivularis*

Dubatolov, 1996b: 41, *Cymbalophora rivularis*

**Description.** Alar expanse 33-36 mm. Fw of male white or slightly yellowish, coated with numerous, narrow, black, triangular or round spots and short lines. Hw almost clean white. Head, prothorax and tegula coated with long light hairs; thorax dark. Abdomen light. Female short-winged, flightless.

**Variability.** A number of individual variations have been described. They are reduced to the fusion of markings along or across the wing (e.g. *dannehli, connexa*) or with maculae on the hw (f. *posteripunctata* Dannehl, 1929).

**Distribution.** Pattern Mediterranean.

Within the former Soviet Union. Caucasus (Daghestan), Transcaucasia: Armenia (Mt. Aragats, Lake Sevan, Dilijan), Nakhichevan.

Beyond the former Soviet Union. Central Italy; Balkans; Turkey (east of Lake Van), western Iran.

**Biology.** Flight in July-September, at least so in Armenia on the mountain slopes at 1900-2000 m a.s.l. Caterpillar black-gray, with neat, yellow, dorsal lines and dark maculae on them. Warts nitidous black, each with a short yellow fascicle of hairs. False legs red or red-and-white, thoracic legs gray or reddish. Head yellow-gray. Caterpillars living on *Galium, Asperula cynanchica*. Pupation on ground in a cocoon made of ground and hairs tied with silk strands. Pupa nitidous red-brown, hibernating.

**Similar species.** *Divarctia diva* Staudinger, 1887, is much larger (alar expanse 42-45 mm), the male antennae are comb-bearing. *Cymbalophora pudica* (Esper, 1785), from southwestern Europe and absent from the former Soviet Union, shows a red abdomen.

5. Genus *Carcinopyga* Felder, 1874

*Carcinopyga* Felder, 1874: pl. 101, fig. 3, TS: *Carcinopyga lichenigera* Felder, 1874.

= *Euarctia* Staudinger, 1887a: 79, TS: *Euarctia proserpina* Staudinger, 1887a.

Antennae short, simple, eye small. Accessory cell on fw present, originating from connection of stalk R2-R4 with R5. Fw dusty gray with yellow unclear spots or fasciae, often degraded.
Key to species of Carcinopyga (based on males):
1. Hw infuscate, with 2 rows of submarginal spots. ................................................................. C. lichenigera
   – Hw without submarginal spots. ........................................................................................................ 2
2. Spot on discal vein of hw present. ........................................................................................................ 3
   – Spot on discal vein of hw absent. ......................................................................................................... C. gurkoi
3. Hw white. ........................................................................................................................................ C. proserpina
   – Hw yellowish. ...................................................................................................................................... C. lindti

Note. The female of C. proserpina shows the hw yellowish like in C. lindti.

7. Carcinopyga lichenigera Felder, 1874

Carcinopyga lichenigera Felder, 1874: pl. 101, fig. 3, TL: Ladak (India).

[lichenigera – lichen-bearing (Lat.)]

Seitz, 1910: 97, pl. 17, row g, Carcinopyga lichenigera
de Freina, 1982: 12, Carcinopyga lichenigera nuytenae
Dubatolov, 1996b: 42, Carcinopyga lichenigera (misidentifcation)

Description. Alar expanse 66-70 mm. Fw bluish gray with light transverse bands in a dark frame. Hw orange pink with several black maculae prolate in transverse direction.

Distribution. Pattern Central Asian.
Within the former Soviet Union. Khorog, Ishkashim (?) (Kautt & Saldaitis, 1997: 139, map).
Beyond the former Soviet Union. Eastern Afghanistan, northern Pakistan, northern India (Kashmir, Ladak, Leh) (Thomas, 1989).

Variability. C. lichenigera nuytenae de Freina, 1982, differs by a lighter background of the hw. Pakistan, the Himalaya.

Biology. A high-montane species volant at heights more than 3000 m a.s.l. and recorded in alpine meadows and rock denudations. Flight in July to August.

Similar species. C. proserpina, differs by a strong dark dusting of the fw and a wider apex of the cucculus in the genital apparatus of the male. Hw without submarginal pattern.

8. Carcinopyga proserpina (Staudinger, 1887)

(Pl. 3, Figs 2-3; genitalia in Pl. 25, Fig. 5)
Euarctia proserpina Staudinger, 1887: 80, TL: “Prov. Samarkand”.

[proserpina – the goddess of the nether world (Gr.)]

Seitz, 1910: 97, pl. 17, row g, Carcinopyga proserpina
Dubatolov; 1996b: 42, Carcinopyga proserpina

Subspecies:

Description. Alar expanse of male 62-67 mm. A black-gray background coloration of fw formed from above by rich dusting of black scales. Light yellowish, transverse belts coming out against this background. At costal edge of fw these belts forming rather clear yellow maculae (altogether four). Hw white with a dark gray crescent spot on discal vein. Head and thorax black, abdomen of male yellow from above. Underside of wings white, with a black pattern consisting of spots at costal edge of fw. Hw with a large spot at costal edge and crescent at the centre. Abdomen on underside black except for yellow last segments. In female, hind half of abdomen black from above.

The ssp. *lindti* Černý is a well-distinguished colour form originally described as a separate species from the Ugamsky Mt. Range, West Tian-Shan. The moth differs from *C. proserpina* by the yellowish hw and the same underside. It is distributed in the Kirghizsky (Aksu-Dzhebagly), Chatkalsky, Kuraminsky, Karzhantau and Ugamsky Mt. ranges in the West Tian-Shan, and near Lake Issyk-Kul, Central Tian-Shan. Indeed, this Tian-Shan form might prove to represent a separate species, as accepted by Dubatolov (1996b) and some other students. No area of sympathy of these two forms has been found.

Distribution. Pattern Central Asian.


Beyond the former Soviet Union. Northeastern Afghanistan.

Biology. Flight in the end of summer and in autumn at 1300 up to 2500 m a.s.l. At greater elevations moths appearing in the middle of July, below in September on slopes of mountains covered by bush or sparse woodland. Both males and females flying to light. Caterpillars born in September to October, hibernation at instar 3, euryphages feeding on *Artemisia*, *Euphorbia*, Cruciferae, Umbelliferae, etc.

Eggs round, smooth, yellowish white, about 1.5 mm in diameter. Freshly hatched caterpillars brownish with dotted warts and sparse short hairs. Feeding at night. Caterpillars after the 6th molt reaching a length of up to 60 mm. Dorsum dark brown, venter and abdominal legs lighter. Each segment with eight large warts coated with fascicles of hairs, latter reddish on thorax, gray on each side. Two light yellow lateral maculae on each segment, one smaller below in front part of segment, the other larger behind and above. Head black and shining. When reared in culture, tree leaves not rejected by caterpillars. Pupation in an oval cocoon. Pupa dark brown, nitidous. Duration of pupal stage about three weeks.

Similar species. *C. lichenigera*, differs by a dark hw with submarginal belts. *C. gurkoi*, has no spots on the discal vein.


(Fig. 14)

*Carcinopyga gurkoi* Kautt & Soldaitis, 1997: 130, figs 12-21, TL: Western Pamirs (Rushan).

[*gurkoi* – in honour of Ukrainian entomologist V. Gurko]

Dubatolov, 1990b: 87, *Carcinopyga lichenigera* (misidentification)

Dubatolov, 1996b: 42, *Carcinopyga gurkoi*

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**Description.** (based on paratype, ♂, Fig. 14). Length of fw from base to apex 26 mm. Alar expanse up to 60 mm. Background coloration of fw gray. Upper side with several yellowish, transverse belts clear against this background. These belts consisting of separate, repeatedly interrupted, costal and inner series of maculae. Fringe gray-brown. Underside of fw pale yellow with four separate black maculae at costal edge. Hw from above pale yellow without spots; coloration of fringe varying from creamy white to gray-brown. Discoidal spot absent. Underside: background coloration

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*Fig. 15.* Uzbekistan, W. Tian-Shan, Pskem Mt. Range, 700 m, place inhabited by *Dicerota dica* Stgr., *Carcinopyga lindt* Černy, *Arctia intercalaris* Ev., *A. caja tsingana* Shel., *Eucharia festiva interposita* O. B.-H. (photo by V. S. Murzin).

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*Fig. 16.* Tajikistan, W. Pamirs, Rushan Mt. Range and Pyanj River on Tajik-Afghan border, habitat of *Carcinopyga gurkoi* Kautt & Soldaitis (photo by A. Sotchivko).
and fringe as from above. Black spot in basal part of costal edge clearly expressed and reaching the discoidal cell. Discoidal spot vague, dark pollination of discoidal cell present. Head, forehead (epicranium) and palpi black. Antennae simple, brown-yellow. Patagia and tegula black. Dorsum dark gray to black. Venter gray-yellow. Legs dark brown with creamy white rings. Upper side of abdomen gray-yellow, a darker line partly discernible. Underside black with ochre borders of segments. Female unknown.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. West Pamirs (Rushan, Khorog)

Beyond the former Soviet Union. Northern Afghanistan (local).

**Biology.** Occurring in the alpine belt of western Pamirs between Rushan and Khorog, where the dry and continental climate of the Pamirs high mountains is softened by Pyanj River and its tributaries. There \( C. gurkoi \) fly over patches of talus between 3300 and 3500 m a.s.l. together with \( C. proserpina \) (Dubatolov, 1990b, as \( C. lichenigera \)).

**Similar species.** \( C. proserpina \), differs by strong dark dusting of the fw, by the larger size and a wider apex of the cucullus in the genital apparatus of the male.

### 6. Genus *Axiopoena* Ménétriès, 1842


Dubatolov, 1989a: 8-11, *Axiopoena*

Moth large, head small in comparison with body, covered with dense thick hairs. Eyes large, hemispherical, bare. Body rather wide, legs clothed with small, dense scales; fore tibia with a small epiphysis, medial tibia with a pair, hind tibia with 2 pairs, of very short thick spurs, or calariae. Wings opaque, rather wide. Vein R2 on fw starting from central cell. Fw black, hw black with a red or pink basal field. Male genitalia with a long, narrow, curved process at costal edge of valvae at their base, fastigium of valve with a wide membranous process. Sternite 8 of female with wide blade-like protuberances on each side, ductus like a wide sclerotised tube (Dubatolov, 1989a).

**Key to species of *Axiopoena*:**

1. Black band at base of hw on underside present. A pink spot close to border on upper side. ..................... *A. karelini*

2. Black band at base of hw on underside absent. No pink spot close to border on upper side. ..................... *A. maura*

### 10. *Axiopoena maura* (Eichwald, 1830)

(Pl. 4, Fig.1)

*Bombyx maura* Eichwald, 1830: 196, TL: Turkmenistan (eastern coast of the Caspian Sea, environs of Krasnovodsk).

[= *fluviatilis* Swinhoe, 1885]

[maura – gloomy (Lat.)]

Ménétriès, 1842b: 42, *Axiopoea maura*

Romanoff, 1884: 86, pl. 5, fig. 5, *Axiopoea maura*

Christoph, 1885: 171, pl. 15, fig. 3, *Axiopoea maura*

Christoph, 1887a: 55, *Axiopoea maura*

Hampson, 1901: 498, *Axiopoea maura*

Staudinger & Rebel, 1901: 371, *Axiopoea maura*

Seitz, 1910: 97, pl. 17, row g, *Axiopoea maura*

Lampert, 1913: 357, pl. 89, fig. 7, *Axiopoea maura*

Strand, 1919: 372, *Axiopoea maura*


Kuznetsov, 1960: 11, *Axiopoea maura*

Daricheva, 1972: 72, Ахіопона морда
Dubatolov, 1972: 72, Ахіопона морда
Sviridov, 1972: 47, Ахіопона морда
Ebert, 1973: 67, Ахіопона морда
Dubatolov, 1977: 80, Ахіопона морда
Krasilnikova, 1977: 80, Ахіопона морда
Stshetkin, 1984: 292, Ахіопона морда
Dubatolov, 1989: 8, Ахіопона морда
Dubatolov, 1996b: 42, Ахіопона морда

**Description.** Alar expanse 100-110 mm. Fw coal black, hw dichromatic: external half black, basal pink. End of cell outside often with a pink spot. Underside coloration same but border of fw often clarified, pinkish, or from base of wing with an unclear, pink, short line.

**Variability.** Light pattern on hw varied. Dark marginal band sometimes occupying 2/3 wing, in other cases, when narrowed, then with a vague, black, dentate, transverse band separating pink spots from a black edge. Rarely, fw with traces of white spots.

**Distribution.** Pattern Anatolian-Iranian.
Within the former Soviet Union. Turkmenistan (Merw, Kopetdagh, Ashkhabad, Krasnovodsk, Nebit-Dagh, Balkhan Major), Azerbaijan (Caspian coast, Nakhichevan (east)).
Beyond the former Soviet Union. Southern Afganistan (Swinhoë, 1885), Kurdistan, northeastern Iran.

**Biology.** Flight since July till September, with reports about spring finds. Moths associated with caves, deep clefts in rocks; both adults and caterpillars nocturnal. Repeatedly recorded in great numbers in caves. Flying to light, rather usual.

A description of the caterpillar was given by Christoph (1887b). “The single specimen of the caterpillar brought to me was 72 mm in length and 13 mm in width. It is black-brown, in interspaces of the segments and on the abdomen dark reddish brown. The head and the legs are black, shining. The legs are strong. The abdominal legs are well-developed, on the external side from above black. The strong, a little bluish warts are coated with black hairs of medium length.

In the daytime, the caterpillar hides in various rocks in clefts and crevices. Feeding only in the evening and at night. Food plants near Krasnovodsk are *Artemisia* and probably other herbs.

It pupates in May inside a very fragile cocoon; the pupa is lustrous, smooth, black-brown in colour. The moth appears approximately 14 days after pupation and escapes from the daytime...”.

For reasons unknown, the species was included in the Red Data Book of the USSR (Borodin, 1984b).

**Similar species.** *A. karelini*, the underside of the hw with a dark basal belt; there is no black spot behind the base of vein Cu2 (Dubatolov, 1989a).

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11. *Axiopoena karelini* Ménétriès, 1863

(Pl. 4, Fig. 2; genitalia in Pl. 25, Fig. 6)

*Axiopoena karelini* Ménétriès, 1863: 160, pl. 17, fig. 5, TL: “Tifles” [= Georgia, Tbilisi].

[= *maura* transcaucasia Sheljuzhko, 1926]

[karelini – after Russian entomologist G. S. Karelín]

Christoph, 1884: 109, *Axiopoena maura*
Christoph, 1885: 171, *Axiopoena maura*
Dubatolov, 1989: 10, fig. 1a, *Axiopoena karelini*

**Description.** Alar expanse 100-110 mm. Fw uniform black, hw pink at base, from outside black. Anal angle with a pink spot up to 5-15 mm in size. Underside coloration same but a transverse clinoid band running near base from fore edge of hw.
Variability. In available material, light anal spot of varying size. From the Caucasus, a form with a yellow, not red, pattern has been described: *Axiopoena maura* ab.*flaca* O. Bang-Haas, 1927. This form belongs to *Axiopoena karelini* because *A. maura* is absent from the western Caucasus.

**Distribution.** Pattern Caucasian.

Within the former Soviet Union. Armenia (Yerevan, Dzhermuk, Megri, etc.), Nakhichevan, Georgia, Abkhazia, Sochi (?) (information from the 1930's, probably an isolated population; no records since are known to the author).

Beyond the former Soviet Union. Unknown.

**Biology.** Similar to the previous species. The caterpillar “…at Ardanuchi, in the pontic region, on leaves of *Centaurea*” (Christoph, 1885: 171).

“The vast, stubble hairy, black caterpillar of this species lives on sage-brush and mostly leads a nocturnal way of life, as well as the moth. In our fauna, this is a unique species closely associated with caves. In huge caves near Krasnovodsk, they have been discovered in great numbers. Undoubtedly, in connection with the character of the diurnal refuges is also the moth coloration; its nearest relatives are decorated with light belts over a dark background of the forewings. Occasionally, among *A. maura* there are specimens in which traces of these white bands are still preserved. Thus, melanism appears here as secondary and protective” (Rjabov, 1958: 358).

Rjabov, quoted above, erred in considering *A. karelini* and *A. maura* as one and the same species.

**Similar species.** *A. maura* on the hw underside has no dark basal belt; behind the base of vein Cu2 there is a black spot (Dubatolov, 1989a).

7. **Genus Tyria Hübner, 1819**


= *Hipocrita* Hübner, 1806 (rejected name).

Proboscis weakly developed, antennae in both sexes thin. Fw with an accessory cell (areole), whence all R-veins (R3 and R4 on a common pedicel) originating. Veins R and M1 of hw also on a pedicel. Fw with a carmine red costal stria. Base of cucculus without harpa-process on interior side of valve.

A single representative in our fauna.

12. **Tyria jacobaeae** (Linnaeus, 1758)

*(Pl. 3, Figs 6, 8; genitalia in Pl. 25, Fig. 7)*


[= *confluens* Schultz, 1908; *senecionis* Godart, 1822]

[jacobaeae, *Senecio jacobaea* – foodplant of the larva (Lat.)]
[Cinnabar – crimson bear (Engl.)]
[Blutbär, Karmin Bär – bloody bear, carmine bear (Germ.)]
[Goutte-de-sang – drop of blood (Fr.)]
[Le Carmin – carmine bear (Fr.)]

Schultz, 1908: 183, *Tyria confluens*
Spuler, 1910: 141, pl. 74, fig. 8, *Hipocrita jacobaeae*
Seitz, 1910: 103, pl. 18, row h, *Hipocrita jacobaeae*
Dubatolov, 1996b: 42, *Tyria jacobaeae*

**Description.** Alar expanse 35-37 mm. Fw dark gray with a black fringe and a red band along costal edge. A similar narrow stria along hind edge of fw. Two red spots at external edge. Hw carmine red with a black fringe. Body black, antennae thin.
The moth is so peculiar in coloration that it is impossible to confuse with any other species.

**Variability.** A number of deviations from the typical form are known:
- ab. *confluens* Schultz, 1908 – red spots partly merged;
- ab. *flavescens* Theirry-Mieg, 1889 – flaxen colour instead of red;
- ab. *fulvescens* Spuler, 1910 – spots orange yellow;
- ab. *grisescens* Spuler, 1910 – hws gray;
- ab. *nigrana* Cabeau5 – hw black, only at base with a red spot;
- ab. *pallens* Cabeau6 – fw gray, red colour acyanotic;

**Distribution.** Pattern Euro-Siberian and Nearctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine, Crimea; Moldova; European Russia [south of Vologda and Vyatka, Saratov, Samara and Middle Urals, Uralsk (Zhuravlev, 1909), Millerovo, Rostov on-Don]; Caucasus; Transcaucasia (Georgia, Armenia, western Azerbaijan); West Siberia south of 55°N (Tyumen, Kurgan, Tomsk), in the east apparently up to Krasnoyarsk, Minusinsk, Bratsk; mountains of eastern Kazakhstan; mountains of Central Asia (from Chimgan in the western Tien-Shan up to the eastern part of Zailisky Alatau, Kirghizia and northern Tajikistan).

Beyond the former Soviet Union. Western Europe, up to Ireland in the north, southern parts of Scotland and Scandinavia; Asia Minor; China (Xinjiang); North America: since the end of the 1950’s, introduced into Canada (British Columbia) and the USA (Oregon, California) (Nagel & Isaacson, 1974) as well as New Zealand, Tasmania and Australia.

**Biology.** Flight not very active, restricted to daytime or resting in grass on open places (meadows, steppe, alpine belt). Common. In the mountains of Central Asia (Chatkalsky Mt. Range, Chimgan Mts) reaching an altitude of 3000 m a.s.l. In lowlands, appearing in May (in Siberia, up to mid-June), in the mountains before the beginning of July. Eggs spherical, yellow; laid in clusters of ~50 eggs, usually on the underside of leaves. Freshly hatched larvae pale yellow, later instar caterpillars velvety black with black head and rather long hairs, body with alternating black and orange yellow rings. Food plants: *Senecio jacobaea*, *Petasites* and *Tussilago*. Early instars living on the underside of lower leaves, later stages migrating to the upper parts of plants, with feeding mainly on flowers. Fully fed caterpillars often migrating rather far for pupation, selecting dry places under stones or dead logs. Pupa reddish brown in a thin cocoon, hibernating; only one generation a year.

**Notes.** *Senecio jacobaea* is a plant species toxic to horses and cows. Yet it is a natural food plant of *Tyria jacobaeae* and, although caterpillars can feed on closely related *Senecio* species, they rarely occur there.

*T. jacobaeae* was introduced into New Zealand in 1929 as a biological control agent of *Senecio jacobaea* only after extensive host specificity tests had been performed to show that it did not pose a threat to any desirable plant. Likewise, the moth has been introduced deliberately into Australia from England several times since 1930, to control the weed.

Caterpillars reduce seed production by consuming flowers and, when they occur in sufficient numbers, they can totally defoliate *Senecio jacobaea*. However, by the end of March they all pupate, allowing some damaged plants time to regenerate before the end of the growing season. Extensive defoliation and defloration by *T. jacobaeae* caterpillars may induce plants that would have died at the end of their second year to become perennial, as can happen with plants that have been mown. When plants are under stress from other causes such as drought, feeding by *T. jacobaeae* caterpillars may kill them, however.

The Department of Conservation and Natural Resources of Australia spends approximately $1.5-2.0 million annually on *Senecio jacobaea* control.

**Similar species.** A single species in our fauna.

8. Genus *Dodia* Dyar, 1901

*Dodia* Dyar, 1901: 85, TS: *Dodia albertae* Dyar, 1901 (by monotypy).

= *Hyalocha* Hampson, 1901: 202, TS: *Lithosia diaphana* Eversmann, 1848

Strand, 1919: 103, 107, *Hyalocha*

Bryk, 1937: 44, *Hyalocha*

5 Cited after Draudt, 1931: 90.
6 Cited after Draudt, 1931: 90.
7 The species has changed its life cycle in the Southern Hemisphere. Flight in January to February.
Wing pattern of Type II C, fws monochromous without pattern. Wings gray, semi-transparent, with weak, scattered, narrow scales. Veins visible. Venation strongly varied even in individuals of one species. R1 always removed from upper edge of radial-cubital cell. R5 branching off earlier R2-4 or starting from one point with R2 + R3 + R4. Sometimes R3 merging either with R2 or R4. M1 often situated on a common stalk with R2-5 or originating as an independent branch from apex of radial-cubital cell. Base of branches M2 and M3 always close to each other, hardly removed above inner angle of radial-cubital cell. On hw, Sc merging with R approximately over 1/3 extent of radial-cubital cell. M2 located far from M1, close to M3. Both M3 and Cu1 starting from one point of lower angle of radial-cubital cell. Antennae filiform. Proboscis not developed. Middle tibiae with one pair, hind tibiae with two pairs, of spurs, or calariae.

Notes. The genus *Dodia* was originally described from the north of Canada. The sole representative of this genus, *D. albertae* Dyar, was believed spread only in the north of North America. However, as shown by Lafontaine & Tshistjakov (1984), the type-species of the genus *Hyalocoa* Hampson, *H. diaphana* (Eversmann), distributed in Siberia, Mongolia and the Russian Far East, belongs to *Dodia*. Thus, *Hyalocoa* was suppressed as a junior synonym. Furthermore, both *H. atra* A. Bang-Haas, 1912 and *H. kozhantshikovi* Sheljuzhko, 1918, described from Siberia, are synonyms of *Dodia albertae*.

A new congener has recently been described from Canada: *Dodia verticalis* Lafontaine & Tshistjakov, 1999.

Key to species of *Dodia*:
1. Patagia, collar and abdomen yellow with dark spots both on upper- and underside. .................. *D. diaphana*
   –. Abdomen gray. .................................................................................................................................................... 2
2. Fw and hw uniform gray, semi-transparent, without pattern. ................................................................. 3
   –. Fw with a pattern of four transverse, whitish, sinuous belts weakly visible over a grayish background. ... *D. albertae*
3. Alar expanse of males more than 27 mm. .......................................................... *D. kononenkoi*
   –. Alar expanse of males less than 22 mm. Female with abortive wings, uncapable of flight. .................. *D. sazonovi*

13. *Dodia diaphana* (Eversmann, 1848)

(Pl. 4, Fig. 4; genitalia in Fig. 17 and Pl. 25, Fig. 8)


[diaphana – transparent, translucent (Lat.)]
Herrich-Schäffer, 1853: 176, fig. 168, Hyalocoa diaphana
Hampson, 1901: 202, Hyalocoa diaphana
Strand, 1919: 107, Hyalocoa diaphana
Draudt, 1931: 90, Hyalocoa diaphana
Bryk, 1937: 45, Hyalocoa diaphana
Tshistjakov & Lafontaine, 1984: 1549, Dodia diaphana
Tshistjakov, 1988: 635, Dodia diaphana arctica
Dubatolov, 1996b: 43, Dodia diaphana

Subspecies:

Description. Alar expanse 32-33 mm. Fw and hw gray, semi-transparent with weak dusting. Veins easily discernible over this background. Abdomen yellow with black spots. Patagia yellow. Female with an enlarged abdomen.

Variability. The nominotypical subspecies occurring in the southern part of the geographic range. From the upper reaches of Kolyma and Yana rivers, northeastern Siberia, a separate subspecies has been described:
ssp. arctica – “differs from the nominotypical subspecies by the more intense dusting of dark, almost black scales, and by the rather narrow forewings (the wing two times longer than wide”). Wings very dark, almost black. The holotype is in ZISP.

Within the former Soviet Union. The mountains of South Siberia (Altai: Aktash, Kosh-Agach, Ukok Table-land; East Sayan), Transbaikalia and Stanovoy Mt. Range; Amur region; Sikhote-Alin Mts; central and eastern Yakutia; Magadan Region (upper Kolyma River, Omolon River).
Beyond the former Soviet Union. Northern Mongolia (Chovsogol region), northwestern China.


Similar species. All other congeners with both abdomen and patagia gray, not yellow. Epimydia dialampra
Staudinger, 1892b – small size, antennae pinnate.

14. Dodia albertae Dyar, 1901

(Genitalia in Fig. 18)
Dodia albertae Dyar, 1901: 85, TL: Calgary, Canada.

[ = kozhantshikovi Sheljuzhko, 1918]

[Alberta – a province in Canada]

Bang-Haas, O., 1927: 77, Hyalocoa diaphana ab. atra
Tshistjakov, 1988: 638, fig. 5, Dodia albertae eudiopta
Dubatolov, 1996b: 43, Dodia albertae

Fig. 18. Male genitalia of Dodia albertae albertae Dyar, ♂. Canada (after Tshistjakov, 1988).
Subspecies:

*D. a. albertae* Dyar, 1901

*D. a. eudiopta* Tshistjakov, 1988: 638

*D. a. atra* (A. Bang-Haas, 1912) [= *Hyperborea kozhantschikovi*].

**Description.** Alar expanse 25-30 mm. Fw wide, gray with a well-developed pattern of transverse whitish belts. Costal edge and median cell dusted dark. External and submarginal belts thin and sinuous. Pattern of female strongly diffuse. Male genitalia: uncus straight with a flat apex. Upper and lower distal processes of valve well-expressed, with a pointed apex.

**Variability.** The following subspecies have been described from Siberia:

ssp. *eudiopta* – lower flow of Lena River, differs from the nominotypical subspecies in the smaller size, lighter brownish pale wing coloration and details of genitalic structure: upper distal process of valve not expressed; lower wide, almost square, with an obtuse apex;

ssp. *atra* [= *Hyperborea kozhantschikovi*] – East Sayan, Transbaikalia, Yakutia, southern part of Magadan Region; northern Mongolia.

**Distribution.** Pattern Holarctic.

Within the former Soviet Union. The mountains of South Siberia from the East Sayan Mts to Transbaikalia and Stanovoy Mts; northern Siberia (northern Urals, southern Taimyr Peninsula, Yakutia; Magadan Region (upper reaches of Kolyma River).

Beyond the former Soviet Union. North Mongolia; Alaska; Canada, up to Quebec in the east.

**Biology.** Flight in the end of June, July. Moths occurring on gravel, taluses, with bushes of cedar elfin thickets and swampy larch forests (Tshistjakov, 1988).

**Similar species.** *D. diaphana* with the abdomen and patagia yellow, *D. kononenkoi* and *D. suzonoci* without pattern on the fw.

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**Fig. 19.** Russia, Altai Mts, Ukok Table-land, 2900 m, habitat of *Dodia diaphana* (Ev.), *Epinydia diadema* Stgr., *Pararetia lapponica* (Thunb.) and some others (photo V. S. Murzin).
15. *Dodia kononenkoi* Tshistjakov & Lafontaine, 1984

(Genitalia in Fig. 20)

*Dodia kononenkoi* Tshistjakov & Lafontaine, 1984: 1553, figs 5-9, TL: Magadan Region (Sibit-Tyellakh, Bolshoi Annaehag Mt. Range). Holotype: ZISP.

[kononenkoi – in honour of Russian entomologist V. S. Kononenko]

Tshistjakov, 1988: 634, 636, figs 2, 3 (gen.), *Dodia kononenkoi transbaikalensis, Dodia kononenkoi sikhotensis*

Subspecies:

- *D. k. kononenkoi* Tshistjakov & Lafontaine, 1984
- *D. k. transbaikalensis* Tshistjakov, 1988

Key to subspecies of *Dodia kononenkoi* (after Tshistjakov, 1988):

1. Apex of uncus reduced, flat. Upper distal process of valves like a small tubercle, smaller than lower process; latter like a wide blade with a smoothly rounded apex. ...............................................
2. Apex of uncus more or less enlarged, with a small hollow in the middle. Distal process of valve different in shape. ................................................................................................................. 2

2. Valve with a trapezoidal protuberance at costal edge. Distal processes of valves subequal in size, widely separated.

2. Valve without trapezoidal protuberance at costal edge. Upper distal process of valve strong and wide, 3 times broader than lower process; latter like a narrow triangular blade with a rounded apex. ...............

**Description.** Alar expanse 34 mm. Body gray. Fw and hw wide, almost black with visible veins. Pattern missing. Female lighter.

**Variability.** The nominotypical subspecies occurring in northeastern Siberia, in Chukot Peninsula, Russia and Canada;

- *ssp. transbaikalensis*, differs by the lighter colour infuscated at base and along the distal vein as well as by certain details of genitalie structure. Khamar-Daban and Yablonovyi Mt. ranges.

Holotype ♀: Irkutsk, 15 km south of Slyudyanka, Khamar-Daban Mts, h = 1850m, 16.VIII.1984, leg. Sinev, IB SD RAS;

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**Fig. 20.** Male genitalia of *Dodia kononenkoi*. 1. *D. k. kononenkoi* Tshistjakov & Lafontaine; 2. *D. k. transbaikalensis* Tshistjakov, uncus and right valve (holotype) (after Tshistjakov, 1988).
ssp. sikhotensis, differs by the slightly lighter and completely monochromous fw as well as by details of genitalie structure. Sikhote-Alin, Russian Far East.

Holotype ♀: Primorsky Reg., Mt. Golets, h=1450 m, 15.VII.1972, leg. Vasyurin, ZISP RAS.

**Distribution.** Pattern Holartic.

Within the former Soviet Union. Baikal and Transbaikalian regions (Khamar-Daban, Chita: Sokhondo, Yablonovyi and Udokan Mts; Sikhote-Alin Mts; Magadan province (upper reaches of Kolyma River), Polar Ural, Norilsk.

Beyond the former Soviet Union. Yukon Territory, Canada.

**Biology.** Flight in July. Moth living on open places above the upper forest line (“goltsy”) and in moss-clad fir forests on southern slopes at about 1500 m a.s.l.

**Similar species.** *D. diaphana* with the collar and patagia yellow; *D. albertae* displays a pattern on the fw; *D. sazonovi* is noticeably smaller and lighter.

### 16. *Dodia sazonovi* Dubatolov, 1990

*(Pl. 4, Figs 3, 6; Fig. 21)*

*Dodia sazonovi* Dubatolov, 1990d: 148, fig. 2, TL: Altai, environs of Aktash, 2700-3000 m.

[sazonovi – after Russian amateur entomologist S. Sazonov]

**Description.** Fw of male slightly prolate, transparent, up to 11 mm in length, light gray with dark veins. A clear pattern of pallid belts. Hw wide, transparent, without pattern. Female with transparent short wings (fw about 5 mm, hw twice shorter). Body stout.

**Variability** inappreciable.

**Distribution.** Pattern South Siberian.

**Biology.** Alpine taluses at more than 2700 m a.s.l. on slopes of western or southwestern exposition. Females resting under flat stones close to their freed cocoons, egg-laying events usually two, each carpet-like, up to 50 eggs in the first

**Fig. 21.** Female, empty cocoons of male and an egg batch of *Dodia sazonovi*. Russia, Altai Mts, near Aktash, 2900 m a.s.l. (photo by V. S. Murzin).
clutch, less in the second. Males flying in the daytime above stones. Food plants of caterpillars: Dryas. Cultivation successful on Taraxacum. Larva gray or flesh-coloured with black warts on each segment. Sides with four warts with short wiry hairs. Dorsum with an axial yellowish line, paramedian warts with long setae (two rows). Caterpillars hibernating. In spring they probably do not eat, pupating shortly after snow melting. Males appearing at the end of June to July.

**Similar species.** D. diaphana with yellow abdomen, collar and patagia; D. albertae with a pattern on the fw; D. kononenkoi is much larger.

### 9. Genus *Epimydia* Staudinger, 1892

*Epimydia* Staudinger, 1892b: 346, TS: *Epimydia dialampra* Staudinger, 1892b.

= *Epimedia* Rothschild, 1910 (misspelling)

Head small, epicranium strongly setose, eyes large, palps very small. Male antenna pinnate, less than half as long as fw. Thorax and abdomen slender. Wing pattern of Type II C, fws monoehromous without pattern.

A single species.

### 17. *Epimydia dialampra* Staudinger, 1892

(Pl. 4, Fig. 5; genitalia in Pl. 25, Fig. 9)

Staudinger, 1892b: 356, pl. 3, fig. 2, TL: “Kenteigebirge” [= Kentei Mountains in southern Siberia].

[dialampra – transparent (Gr.)]

Seitz, 1910: 74, pl. 13, row i, *Epimydia dialampra*

Strand, 1919: 107, *Epimydia dialampra*

Tshistjakov, 1988: 634, *Epimydia dialampra*

**Description.** Alar expanse about 25 mm. Fw narrow, triangular. Hw wider, rounded, uniform gray, semi-transparent (fw a little lighter than hw). Fringe rather infrequently consisting of long hairs. Head, thorax and abdomen black. Last segments of abdomen densely coated with yellow hairs.

**Distribution.** Pattern Siberian.

Within the former Soviet Union. Krasnoyarsk Region (Minusinsk), Altai (Aktash, Chagan-Uzun, Kosh-Agaech, Ukok Plateau), Tuva, East Sayan (Mondy), Transbaikalia (Vitim Highway), Yakutia (Indigirka River).

Beyond the former Soviet Union. Mongolia.

**Biology.** Occurring locally on mountain meadows. Flight from early June up to mid-July at elevations up to 2000 m a.s.l.

**Similar species.** Superficially reminding of some species of the genus *Heterogynis* Rambür, 1866 (Heterogynidae) from Southern Europe and North Africa.

### 10. Genus *Lacydes* Walker, 1855

(Genera in Pl. 25, Fig. 10)


= *Acimba* Rambür, 1866: 235, TS: *Noctua spectabilis* Tauscher

= *Palparctia* Spuler, 1910: 133, TS: *Noctua spectabilis* Tauscher

= *Volgarctia* Alpheraky, 1908: 606, TS: *Noctua spectabilis* Tauscher

Seitz, 1910: 89, *Lacydes*

Fang, 1985: 32, *Lacydes*
Fw with R2-R5 on a joint stalk, Sc of hw merging with R only closer to base (to a length less than 1/3 cell), R2-M1 and M3-Cu1 on joint stalks. Male genitalia: uncus very large, narrow at base and broadened to apical 1/3, with its tip like a hook-like process, tegumen in lateral view very large, slightly longer than uncus.

18. *Lacydes spectabilis* (Tauscher, 1806)

*(Pl. 4, Figs 7-10; genitalia in Pl. 25, Fig. 10)*

*Noctua spectabilis* Tauscher 1806: 212, TL: Volga (Volga River, Russia).

*[= *Eyprepia intercissa* Freyer, 1842]*

*spectabilis – remarkable* *(Lat.)*

Tauscher, 1811: 179, pl. 13, fig. 6, *Noctua spectabilis*

Herrich-Schäffer, 1843: 145, figs 9-10, *Cheimia spectabilis*

Staudinger & Wocke, 1871: 58, *Arctia spectabilis*

Erschoff, 1874: 32, pl. 2, fig. 28, *Arctia spectabilis*

Christoph, 1887b: 55, pl. 3, fig. 2, *Arctia spectabilis anellata*

Kirby, 1892: 951, *Lacydes spectabilis*

Hampson, 1901: 272, *Diacrisia spectabilis*

Seitz, 1910: 89, pl. 15, row 1, *Lacydes spectabilis*

Fang, 1982: 212, fig. 1569, *Lacydes spectabilis*

Dubatolov, 1996b: 44, 70, 74, fig. 2a, *Lacydes spectabilis sheljuzhkoii*

Fang, 2000: 315, pl. 14, fig. 9, *Lacydes spectabilis*

Subspecies:

*L. s. anellata* Christoph, 1887b

*L. s. sheljuzhkoii* Dubatolov, 1996b.

**Description.** Alar expanse 32-37 mm. Wings rather narrow and sharp, background coloration light, almost white, with yellow tint. On fw, cream brown spots partly merged and creating bands, these at an angle of about 45° running to hind edge of wing. Hw of male with small brownish spots or a boundary belt. Hw of female darkened. Abdomen light with transverse lines on each segment. Antennae of male short, pinnate, in female simple.

**Variability.** Individual variability becomes apparent in the development of a dark pattern and colour intensity. In particular, the boundary belt on the hw sometimes vanishes.

The nominate form (Pl. 4, Figs 7-8) is distributed over the greater part of the range from the Ukraine up to southern Kazakhstan.

The ssp. *anellata* (Pl. 4, Figs 9-10) differs by a more contrasting pattern. Dark spots on fw often reduced in size and outlined by a thin black contour. Colour of hw yellow with or without dark boundary belt. This form has been described from the Kopetdagh, Turkmenistan and also occurs in the mountains of Great and Small Balkhan as well as in Iran. Some specimens from Khorog, Pamirs are lighter, with a white hw devoid of a pattern.

The ssp. *sheljuzhkoii* flies in southern Transcaucasia and northeastern Turkey. “The main character of the new subspecies is a clear yellowish, not whitish, background of the wings. On the fw being dark yellow, the spots are without grayish brown tint, which is typical of both other known species”. Holotype in ZMKU.

**Distribution.** Pattern southern Palaeartic.

Within the former Soviet Union. Southeastern Ukraine (Kharkov, Lisichansk, Novoalexandrovka); European Russia up to Penza and Vyatka in the north, Rostov-on-Don, Volgodonsk, Millerovo, Volga region, southern Urals; southern part of West Siberia (steppe and forest-steppe belts: Kurgan Region up to Iset River, Orenburg, Karasuk in the Novosibirsk Region, the Kulunda steppe in Altai Province, local in the West Altais); Kazakhstan (Dzhanybek, Uralsk, Aralsk); Tian-Shan (Issyk-Kul, Alma-Ata); Pamirs (Khorog), Turkmenistan (Kara-Kala, Ai-Dere); southern Transcaucasia (Azerbaijan, Armenia).
Beyond the former Soviet Union. East Turkey; North Iraq; Iran; Afghanistan; China (Xinjiang); South Mongolia.

**Biology.** Flight from early August (Orenburg, Lower Volga region) to the beginning of October (Khorog, Pamirs and Kopetdag Mts). Mainly inhabiting dry steppe and semi-desert places, though in the Kopetdag and West Pamirs flying massively on light in parks and gardens. Caterpillar dark gray-blue, clothed with yellow hairs. Body annulated yellow. A black line lying above legs, with a wide white stria above and red spiracles. Legs red-brown. Larvae appearing in autumn and hibernating; development completed in June or July. Food plants of caterpillars: different herbs, especially sagebrush (*Artemisia*).

**Similar species.** There seem to be no particularly similar species in our fauna.

11. **Genus Spiris Hübner, 1819**


= *Eypreria* Ochsenheimer, 1810: 299, TS: *Phalaena grammica* Linnaeus

= *Callopis* Billberg, 1820: 91, TS: *Phalaena grammica* Linnaeus

= *Eulepis* Curtis, 1825: 56, TS: *Phalaena grammica* Linnaeus

= *Ctenia* Le Poecies, 1825: 650, TS: *Phalaena grammica* Linnaeus

= *Emydia* Boisduval, 1829: 39, TS: *Phalaena grammica* Linnaeus

= *Euprepia* Herrich-Schäffer, 1847: 141, TS: *Phalaena grammica* Linnaeus

Dubatolov, 1990f: 128, *Spiris*

Fang, 2000: 303, *Spiris*

Fw narrow, hw wide with vein M3 absent. Wing pattern of Type II B, fws monochromous, with separate longitudinal bands, palps small, directed down. Male genitalia: transtilla with a strong chitinised process, uncus concave at apex.

In our fauna, two species are present.

19. **Spiris striata** (Linnaeus, 1758)

(*Pl. 4, Figs 11-13*)

*Phalaena striata* Linnaeus, 1758: 502, TL: Germany (Saxony).

[= *Phalaena grammica* Linnaeus, 1758; *Phalaena processionea* Müller, 1774; *Phalaena palladia* Foureroy, 1785; *Coscinia albida* Schulze, 1910; *Eypreria nigra* Spuler, 1913; *Eypreria xanthoptera* Oberthür, 1911, *Eypreria incompleta* Oberthür, 1911; *Eypreria extremana* Rocei, 1914; *Eypreria pfeifferi* Stauder, 1920; *Eypreria commerelli* Stauder, 1920; *Eypreria aterrima* Gede, 1923; *Eypreria nigrochiliata* Schawerda, 1929b; *Coscinia slovenica* Daniel, 1939; *Coscinia hospitalis* Marten, 1948; *Coscinia chrysographis* Marten, 1948]

[striata – stripy (Lat.)]

[Feathered Footman – (Engl.)]

[La Chouette, Ecaillé Chouette – (Fr.)]

[Strohhütchen, Gestreifer Grasbär – (Germ.)]

Hampson, 1901: 203-204, *Euprepia striata*

Seitz, 1913: 72, pl.13, row f, *Coscinia striata*

Dubatolov, 1990c: 128, *Spiris striata*

Fang, 2000: 303, pl. XIV, fig. 3a, b, *Spiris striata*

**Description.** Alar expanse 28-35 mm. Fw narrow. Hw wider, rounded. Coloration of fw consisting of longitudinal black and yellow (on veins) fasciae; discoidal cell of fw also filled by yellow. Discal vein on both wings black. Hw yellow except for a dark boundary belt at costal and outer edges and a crescent spot on transverse vein. Underside
coloration yellow with separate black spots on discoidal veins and often with short longitudinal lines on veins at external edge of fw.

Variability. Characterised by strong individual variability. The coloration of the fw varies from light yellow without pattern up to almost completely black.

f. melanoptera (Brahm, 1791) – hw monochromously black. This form has a dark underside of the hw and brown veins on the fw (Pl. 4, Fig. 13).


Within the former Soviet Union. Baltia; Belarus (patchily); Ukraine, Crimea; European Russia [Moscow Region, in the north up to the environs of St. Petersburg (Luga, Krupel) and the Upper Volga region]; Caucasus (Teberda, Nalchik);Transcaucasia: Tbilisi, Borzhom (Georgia), Azerbaijan; North and East Kazakhstan (steppe part); Siberia (south of 56°N in the west and up to 60°N in Yakutia); Kurgan, Tomsk, Krasnoyarsk, Biysk, Irkutsk, and central Yakutia; Transbaikalia (patchily).

Beyond the former Soviet Union. Southern and Central Europe (except for the North Sea coast and the western and southern parts of the Iberian Peninsula); Asia Minor; Syria; China (Xinjiang); in Mongolia patchily (Dood-Nur).


Similar species. Spiris bipunctata: fw lighter with two black points on discoidal vein. Black pattern on hw more strongly developed: black border merged with spot on transverse vein.

20. Spiris bipunctata (Staudinger, 1892)

(Pl. 4, Figs 14-16)

Emydia striata v. bipunctata Staudinger, 1892b: 345, TL: Transbaikalia (“Dauria”).

[bipunctata – two-pointed]

Eversmann, 1847: 73, Euprepia funerea
Dubatolov, 1985: 137, Spiris bipunctata f. nigrina

Description. Alar expanse 29-32 mm. Moth similar to the previous species, but edge of transverse cell with two black points.

Variability. Modest:

f. funerea – uniform black fw and hw (Pl. 4, Fig. 16).


Within the former Soviet Union. Siberia: Southern slopes of West Sayan Mts (the Sayano-Shushenskii Nature Reserve); Tuva; Transbaikalia; Upper Amurland, everywhere patchily.

Beyond the former Soviet Union. Central and Eastern Mongolia (Dood-Nur, frequently); China [Xinjiang, Qinghai, Shanxi, Heilongjiang (Fang, 2000)].

Biology and the preimaginal stages similar to the previous species.

Similar species. S. striata: fw darker without two black points on discoidal vein. Black pattern on hw weakly developed: a black border not merging with spot on transverse vein.

12. Genus Coscinia Hübner, 1819

(Genitalia in Pl. 25, Fig. 11)

In general, moths small with prolate fws and wide hws. Fw with 11 veins. Proboscis weakly developed, male antenna double-combed. Differs from *Spiris* by structure of the genitalia. Male genitalia: transtilla without process, uncus slender and slightly expanded at apex (Pl. 25, Fig. 10)

Six species.

### 21. Coscinia cribraria (Linnaeus, 1758)

*(Pl. 4, Figs 17-18; genitalia in Fig. 6 and Pl. 25, Fig. 11)*


 [=*Bombyx cribrellum* Esper, 1786; *Bombyx colon* Hübnner, 1792; *Bombyx chrysocephala* Hübnner, 1804; *Bombyx punctijera* Freyer, 1834; *Emydia rippertii* Boisduval, 1834; *E. candida* Herrich-Schäffer, 1846; *E. inquinata* Rambür, 1858; *E. anglica* Oberthür, 1911; *E. leucometelas* Oberthür, 1911; *E. rondoui* Oberthür, 1911; *E. ersetens* Oberthür, 1911; *Coscinia cribraria* fumidaria O. Bang-Haas, 1927; *Emydia cribraria* nikitini O. Bang-Haas, 1938]

[cribraria – latticed (Lat.)]

[Speckled Footman – (Eng.l.)]

[Le Crible – (Fr.)]

[Weißer Grasbär – (Germ.)]

Boisduval, 1834: 94, pl. 57, fig. 4, *Emydia rippertii*

Staudinger, 1892b: 346, *Emydia cribrum* sibirica

Seitz, 1910: 71, pl. 13, rows g-h, *Coscinia cribraria*

Bang-Haas, O., 1927: 58, pl. 8, fig. 3, *Coscinia cribraria* fumidaria


Bang-Haas, O., 1939: 54, pl. 1, fig. 11, *Emydia cribrum* nikitini

Fang, 2000: 301, *Coscinia cribraria*

Subspecies

*C. c. candida* (Herrich-Schäffer, 1787)

*C. c. rippertii* (Boisduval)

*C. c. sibirica* (Staudinger, 1892b)

*C. c. nikitini* (O. Bang-Haas, 1938)

*C. c. fumidaria* O. Bang-Haas, 1927.

**Description.** Alar expanse 40-45mm. Fw white. Series of black points or maculae arranged in transverse belts.

**Variability.** Individual variability great and becoming apparent in reduction of dark spots. Several subspecies have been delimited:

ssp. *candida* – a large form with silvery white fws devoid of black spots, distributed in northern Spain and the southern Alps (Pl. 4, Fig. 18). Similar coloured forms occasionally appear in other regions;

ssp. *rippertii* – fw dark gray with translucent dark spots, Iberian Peninsula;

ssp. *sibirica* – black spots attenuated; Siberia, Altai, Transbaikalia (Pl. 4, Fig.17);

ssp. *nikitini* – fw dark gray with two longitudinal stripes. Manchuria, Khingan Mts;

ssp. *fumidaria* – fw soot brown with light, poor strips along the costa, low part of cell and inner border. Hw dark with a white fringe. Tannuola Mts, Shavyr, 2000 m. a.s.l.

**Distribution.** Pattern Palaeartic.

Within the former Soviet Union. Southern part of Siberia [Tyumen, Omsk, Novosibirsk, Krasnoyarsk, Tomsk, Altai (sometimes very common)] up to Yakutia and Khabarovsk; middle flow of Angara River, central Yakutia; very patchily in the Chita Region and in middle Amurland.

Beyond the former Soviet Union. South and Central Europe (except for the western and southern parts of Iberian Peninsula); Asia Minor; Syria; China (Xinjiang); Mongolia.

**Biology.** Flight in June-August in open places, sparse woodlands, fellings, on moors and dry slopes. Occurrences patchy. In the mountains reaching 2000 m a.s.l. (for example, Kuraisky Mt. Range, Altai). Eggs spherical, golden yellow.

**Similar species.** In our fauna, similar species seem to be absent.

### 13. Genus *Utetheisa* Hübner, 1819


- *Deiopeia* Curtis, 1827: 169, TS: *Phalaena pulchella* Linnaeus, 1758
- *Pitasila* Moore, 1877: 599, TS: *Pitasila leucospilota* Moore, 1877
- *Atasca* Swinhoe, 1892: 139, TS: *Phalaena pellex* Linnaeus, 1758

Hübner, 1824: pl. 181, *Utetheisa*; misspelling
Moore, 1860: 306, *Utetheisa*; misspelling
Jordan, 1939: 251-291, *Utetheisa*

A cosmopolitan genus including many species of the same appearance, decently coloured (one of the species from Cuba with brightly crimson both hws and most of fws). On fw, two accessory cells formed by radial and median veins. Hws noticeably wider than fws. Proboscis well-developed. Valva with a pocket-like scent-gland.

Only one species occurring in our fauna. In Japan, China and further to the south, a close species, *U. lotryx* (Cramer & Stoll, 1779), is known to occur. Numerous congeners are known from other parts of the world: *Utetheisa bella* (Linnaeus, 1758); *U. ornatrix* (Linnaeus, 1758); *U. aegrotum* (Swinhoe, 1892); *U. pellex* (Linnaeus, 1758); *U. okinawensis* Inoue, 1976; *U. abraxoides* (Walker, 1862); *U. leucospilota* (Moore, 1877); *U. pulchelloides* Hampson; 1907; *U. pectinata* Hampson, 1907 and many others (see Rothschild, 1914: 260).

### 22. *Utetheisa pulchella* (Linnaeus, 1758)

(Pl. 5, Fig. 1; Fig. 22)

*Phalaena pulchella* Linnaeus, 1758: 534, TL: Southern Europe.

- **pulchra** ([Dennis & Schiffermüller], 1775); *amabilis* (Trost, 1801); *kepida* (Rambur, 1858); *completa* Weymer, 1908; *bicolor* Oberthür, 1911; *arecata* Oberthür, 1911; *antennata* Swinhoe, 1914; *thyaea* Rothschild, 1914; *papiana* Strand, 1919; *nigromaculata* Stetter-Stättermayer, 1939; *rubrior* Stetter-Stättermayer, 1939; *margined* Stetter-Stättermayer, 1939; *designata* Stetter-Stättermayer, 1939; *confuens* Stetter-Stättermayer, 1939; *dehauata* Stetter-Stättermayer, 1939; *duplohamulata* Stetter-Stättermayer, 1939; *albosignata* Stetter-Stättermayer, 1939; *separata* Stetter-Stättermayer, 1939; *ochromaculata* Stetter-Stättermayer, 1939; *brunneomarginata* Stetter-Stättermayer, 1939; *rubrogrisea* Stetter-Stättermayer, 1939; *albociliata* Stetter-Stättermayer, 1939; *depunctata* Stetter-Stättermayer, 1939; *unipunctata* Stetter-Stättermayer, 1939; *brunneocephala* Stetter-Stättermayer, 1939]

The large number of synonyms is the result of a very wide distribution. Most of the names belong to various minor deviations and only few can prove to represent forms of a higher rank.

- *pulchella – pretty (Lat.)*]
- [Crimson-speckled Moth – (Engl.)*]
- [La Gentille, Ecaille Pointillée – (Fr.)*]
- [Grassteppen-Schönbär – (Germ.)*]

Spuler, 1910: 148, pl. 74, fig. 12, *Utetheisa pulchella*
Seitz, 1910: 73, pl. 13, row k, *Utetheisa pulchella*
Finhey, 1979: 166, pl. 43, fig. 771, *Utetheisa pulchella*
Dubatolov, 1996b: 46, _Utetheisa pulchella_

**Description.** Alar expanse 35-40 mm. Thorax speckled, abdomen white. Fw white with rows of red and black dots; hw semi-transparent white with bluish tint and dark maculae at border.

**Variability.** A number of forms have been described, the main being as follows:

_ f. thyter_ Butler, 1877 – very light almost without black points on fw;

_ ab. flava_ O. Bang-Haas, 1927 – yellow instead of red maculae on fw, India; a similar form is known from Capri, Italy;

_ f. bicolor_ Oberthür, 1911 – without black maculae, occurring everywhere but rarely.

**Distribution.** Cosmopolitan.

Within the former Soviet Union. Ukraine, Crimea (last record in 1939: Efetov & Budashkin, 1987), southern part of European Russia, Lower Volga River region, Uralsk (Zhuravlev, 1909), Aralsk (Tschetwerikoff, 1984); Kazakhstan (Semipalatinsk, southern Kazakhstan up to Lake Balkhash in the east); Caucasus (Tbilisi, Borzhami, Baku, Lenkoran); Turkmenistan; Tajikistan; Uzbekistan.

Moth migratory. In this connection, this species occasionally appearing in more boreal regions of Europe, e.g. northern Germany (Standfuss, 1896), southern England and southern Scandinavia, Latvia, Belarus, Karelia, Kama River region, southern part of the Moscov Region.

Beyond the former Soviet Union. Mediterranean (southern Europe, Madeira, Canary Islands, Crete, Cyprus); northern France; Asia [India, Philippines, Vietnam, China (Xinjiang) etc. ]; Australia, America, Africa [including tropical and South Africa (Pinhey, 1979)].

**Biology.** Flight in May-June and in autumn. Eggs laid singly or in batches on the leaves of different plants. Larva dark gray with an irregular pale yellow dorsal line edged on both sides by a black stripe. Below the stripes, there is a series of red blotches margined ventrally by yellow spots and rather long star-shaped fascicles of blackish hair. Head yellow-brown with two black points. Last-instar caterpillar up to 30 mm in length.

Larvae feeding on heliotrope and various herbaceous plants, including plantain (_Plantago_), forget-me-nots etc. and, in the southern countries, on cotton plant. Pupating in a flimsy silk cocoon mixed with larval hairs, all tucked up comfortably in a folded leaf. The duration of the life cycle is a month or more. Caterpillar of the spring generation hibernating. In Europe, apparently 2-3 generations since May till September (Caradja, 1893). In the Crimea, three generations are known (Efetov & Budashkin, 1990), in southern Turkey up to four (Daniel, 1932). In northern Iran (Meshkhed), moths of the first generation appearing in the middle of April and flying till the end of May. The following

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**Fig. 22.** _Utetheisa pulchella_ (L.) resting on a stone. Turkmenistan, Badhkyz Nature Reserve, 16.IV.1969 (photo by V. S. Murzin).
generations flying since June. Moths of autumnal generation in September-October are most numerous (Stshetkin, 1960). According to Stshetkin (1960), moths of the spring generation in Tajikistan are rare, but in autumn they are usual. In Turkmenistan (Badhkyz), the author observed mass appearances of *U. pulchella* in April and September. In tropical countries, the moth flying the year round, in India at the end of December, in Guinea at the end of January.

The aposematic coloration of the moth apparently reflects its danger as prey to some predators. When disturbed, the moth excretes behind the head two drops of repellent fluid (pyrrolisidin alkaloids).

The moth is a potential pest of cotton (Pinhey, 1979). For reasons unknown, the species was included in the Red Data Book of the USSR (Borodin, 1984b).

**Similar species.** Only one species is known in our fauna.

**Subfamily Aretiinae**

14. **Genus *Stauropolia* Skalski, 1988**


This genus has been erected to encompass a fossil moth from the Miocene of Stavropol, North Caucasus.

23. †*Stauropolia nekrutenkoi* Skalski, 1988


[nekrutenkoi – after Ukrainian lepidopterist Y. P. Nekrutenko]

This example of good preservation allows a study to be made of fw venation and colour pattern, both resembling some representatives of *Acerbia*. A detailed description of the holotype is quoted below after Skalski (1988).

Holotype: Stanitsa Sengileevskaia, Stavropol Territory, outcrop 5 (collector B. F. Kaspiev). Besides a label reading “† E 1” (= Paleontological Institute of the USSR Academy of Sciences, Moscow), the sample is supplied with a printed label reading “Geological Museum of Voroshilovsky Ped. Institute”.

**Description.** Fw almost complete, slightly indentate at anal edge, lying on rock surface on dorsal side. Venation partly visible as a convex framework on wing surface (Fig. 23), especially Sc vein and cubital stalk Cu (1+2) with branching Cu1 and Cu2 at external edge. Pattern complete, preserved in good condition. Scales well appreciable. Wing coloration gray-brown, corresponding to rock colour, pattern monochromous brown (Fig. 24). Length of costal edge of wing 23 mm. Wing wide, greatest length to greatest width ratio 2.2. Costal edge straight, apex and tornus rounded, external edge convex. Length of Sc vein reaching 4/5 of costal edge. Length of radial vein, going parallel to costal edge, approximately equal to length of Sc. R4 (?) coming to external edge below apex. R5 branching 1/3 distance off between base of M1 and apex. A feeble frame similar to a vein (R1 ?) extended from radial vein to near M1 ramification between F

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Fig. 23. Wing venation of *Stauropolia nekrutenkoi* Skalski (after Skalski, 1988).
Sc and R. M1 branching off from radial vein at 2/3 wing length. A vein of medial sector (M?) between M1 and Cu1 most appreciable at external edge, branching off from the same point as Cu1 against the base of M1. Cu2 branched at 3/5 length of cubital vein; its base noticeably removed from the base of Cu1. A1 probably elongate, well discernible at the base of wing. A concave frame (F) resembling the anal vein An lying between cubital vein and A1, latter probably a wrinkle.

Pattern consisting of dark and wide bands contiguous to each other and binding a light background of wing by several fuzzy spots. Four largest bands forming bars running parallel to each other and starting from costal edge. Band between M1 and E+eU reaching the tornal part of external edge. Remaining bands ending in the middle part of wing. External, anal and basal fields with three prolate small spots (Fig. 24).

Geological age. Miocene, Karagan horizon.

15. Genus *Parasemia* Hübner, 1820

(Genitalia in Pl. 25, Fig. 12)


= *Eupsychoma* Grote, 1865: 317. TS: *Eupsychoma geometrica* Grote, 1865


24. *Parasemia plantaginis* (Linnaeus, 1758)

(Pl. 5, Figs 2–13; genitalia in Pl. 25, Fig. 12)


[= *alpicola* (Seopoli, 1763); *hospita* (Denis & Schiffermüller, 1775); *plantaginis* (Haworth, 1803); *matronalis* Freyer, 1843; *subalpina* Schawarda, 1906; *insulae* Scitz, 1910; *carpathica* Daniel, 1939; *thomanni* Kessler, 1951; *geometrica* Grote, 1865; *plantaginis f. geometrica* Holland, 1908; *macromera* Butler, 1881; *macromera leucomera* Butler, 1881; *plantaginis japonica* Inoue & Kobayashi, 1956; *P. p. caspica* Daniel, 1939]

[plantaginis – from ribwort (*Plantago*), the food plant of the larva (Lat.)]
Staudinger, 1884: 277, Nemeophila plantaginis var. hospita and var. floccosa
Romanoff, 1884: 86, Nemeophila plantaginis var. caucasica
Grum-Groschimailo, 1891: 462, Nemeophila sifanica
Spuler, 1910: 141, pl. 74, fig. 10a, b, Parasemia plantaginis
Seitz, 1910: 81, pl. 16, rows d, e, Parasemia plantaginis
Sedykh, 1974: 149, Parasemia plantaginis
Koch, 1984: pl. 2, fig. 56, Parasemia plantaginis
Dubatolov, 1996b: 46, Parasemia plantaginis

Subspecies:

P. p. plantaginis (Linnaeus, 1758)
[= Phalaena hospita ([Denis & Schiffermüller], 1775); Parasemia plantaginis uralensis Krulikovsky, 1904; Parasemia plantaginis carphathica Daniel, 1939; Parasemia insularum Seitz, 1910; P. p. hesselbarthi de Freina, 1981]
P. p. caucasica (Ménětriës, 1832): 262 (Cheilonia caucasica)
[= Parasemia plantaginis passanauriensis Alberti, 1973]
P. p. sifanica (Grum-Groschimailo, 1891) (Figs 25, 26)
[= Parasemia plantaginis altaica Seitz, 1910]
P. p. stoetzneri O. Bang-Haas, 1927: 59, pl. 8, fig. 11σ
P. p. nyciticans (Ménětriës, 1859a: 217) (Lithosia nyciticans)
[= Parasemia plantaginis trybami Bryk, 1942 (nom. nud.); Nemeophila plantaginis ab. melas Christoph, 1893; ssp. floccosa (Graeser, 1888) (Nemeophila plantaginis floccosa)]
P. p. sachalinensis Matsumura, 1927: 59
P. p. araitensis Matsumura, 1929: 168
[= Parasemia plantaginis paramushira Bryk, 1942; Parasemia plantaginis kamtschadalus Bryk, 1942 (nom. nud.)]
P. p. kunashirica Bryk, 1942: 29, pl. 1, fig. 1
P. p. jezoensis Inoue, 1976a: 170, pl. 2, fig. 47

Fig. 25. Mating pair of Parasemia plantaginis sifanica (Gr.-Gr.), Russia, Altai Mts, 10 km E of Aktash, 50°19′N, 87°45′E, 2500 m, 15.VII.2000 (photo by O. G. Gorbunov).
The Tiger Moths of the Former Soviet Union

P. p. melanomera (Butler, 1881): 5, Nemeophila melanomera
[= P. p. japonica Inoue & Kobayashi, 1956; P. p. melanissima Inoue, 1976a]

P. p. petrosa (Walker, 1855): 626, Nemeophila petrosa
[= Nemeophila caesptis Grote & Robinson, 1868; Nemeophila cichorii Grote & Robinson, 1868; Plataractia modesta Packard, 1864, Eupychoma geometrica Grote, 1865; Nemeophila geddesi Neumoegen, 1884; Plataractia scudderi Packard, 1864; Nemeophila seczynii H. Edwards, 1885].

Description. Male: alar expanse 35 mm. Fw black with a yellowish pattern consisting of intersecting bands (EI, Tr2), latter creating an X-shaped pattern in external part of Fw, a rounded spot at apex of discoidal cell and a long stria (Ls) beginning at the base of wing and almost reaching the external edge. Hw yellow with black maculae at edge and dark pollination around cell and along anal vein.

Female. Alar expanse 30 mm. Pattern like in male but hw reddish with a more strongly infuscate base of wing.

Variability significant.

P. p. sifanica. Fw with a strongly developed black pattern, whereas both coloration and pattern of hw close to those of central Russian moths (Pl. 5, Figs 5-7). Pattern in female differing a little from that of the European form but hw yellow. Among the moths from the Altai, males rather often occur that are with yellow hws and a developed black pattern, and also with completely black hws (f. nycticans - Pl. 5, Fig. 9). Altai, southern Siberia; mountains of Mongolia, northern China.

P. p. floccosa. Moth with a strongly developed black pattern; female hw largely black. Middle Amurland, Primorye; Korea.

P. p. sachalinensis. Moth sharply differing from the other forms by white fws and hws of the male. On Fw, the black pattern is strongly reduced, and on the hw there is only a black belt at the wing edge. Female with hw yellow with a black pattern, like in European specimens. (A similar pattern is also observed in the f. confluenta Schawerda, 1906). Sakhalin.

Fig. 26. Parasemia plantaginis sifanica (Gr.-Gr.), ♂. Russia, Altai Mts, 10 km E of Aktash, 50°19’ N, 87°45’ E, 3000 m, 12 VII.2000 (photo by O. G. Gorbunov).

Fig. 27. Parasemia plantaginis caucasica (Mén.), ♂. Armenia, Mt. Aragats, Lake Kara-Gel, 3000 m, ex ovo, 19 VII.1986 (photo by A. Dantchenko).
P. p. auraitensis. Differing by a black hw with an orange submarginal belt. Northern Kuril Islands and Kamchatka. Several other subspecies are known from the adjacent territories.

**Distribution.** Pattern Eurasian.

Within the former Soviet Union. Baltic countries; Belarus; northern Ukraine, Carpathians; European part of Russia [up to Arkhangelsk and Murmansk regions, Komi Republic (Syktyvkar, Ukhta, Polar Urals) in the north]; Middle and South Urals, missing from the steppe-clad areas of the North Caucasus and Crimea but occurring in the mountains of Caucasus (Maikop, Pyatigorsk) and in Transcaucasia (Armenia); Siberia south of ca. 60° N: Altai, Saur, Kuznetskiy Alatau mountains, basin of Lake Baikal, Zeya River, Aldan, Yakutia, Magadan, Sakhalin, Kamchatka and Kuril Islands.

Beyond the former Soviet Union. Western Europe (except for southern Italy and southern Greece); Asia Minor; North Iran (Elburs Mts); Mongolia; China (Xinjiang, Qinghai, Sichuan [in northern Sichuan up to 3200 m a.s.l. (S. Murzin)], Shaans); Korea; Japan (Hokkaido, Honshu); northern and western Canada; western USA.

**Biology.** Flight since May till July in open places. In the mountains reaching 2600 m a.s.l. In the daytime, moths are easy to flush from grass, performing short flights. Males often flying several metres up above ground.

Caterpillar black up to the fifth and after the tenth segment. Segments 5-10 dark testaceous red. Head black. Length of last instar caterpillar up to 35 mm. Larva feeding on various tree or herbaceous plants: *Betula* spp., *Polygonum* spp., *Rumex* spp., *Vaccinium* myrtillus, *V. uliginosum*, *Plantago* spp., *Silene*, *Melandrium* etc. since August till spring. Pupation on the ground or under stones in very thin gray-brown reticulate cocoons.

**Similar species.** There seem to be no similar species in our fauna.

16. Genus *Hyphoraia* Hübner, 1820

*(Genitalia in Pl. 25, Fig. 13)*


= *Hyphoraia* Agassiz, 1847 (misspelling).

Strand, 1919: 128, *Hyphoraia*

Seitz, 1910: 95, *Hyphoraia*

Fang, 2000: 320, *Hyphoraia*

Antennae of male double-combed, in female dentate. A fascicle of long hairs on forehead (epicranium). Palps short, proboscis not developed, eyes clothed with rather sparse long hairs. Male genitalia: valva with one apical process only.

25. *Hyphoraia aulica* (Linnaeus, 1758)

*(Pl. 5, Figs 14-15; Fig. 28; genitalia in Pl. 25, Fig. 12)*

*Phalaena aulica* Linnaeus, 1758: 505, TS: Europe.

 [= *montana* Bergmann, 1953]

[aulica – courtier (Lat.)]
[Ecaille Civique – (Fr.)]
[Hofdame – (Germ.)]

Gillmer, 1905: 131, *Hyphoraia immaculata* [= *bicolor* Spuler]
Sovinsky, 1905: 109-110, *Arctica aulica testudinaroides*

Spuler, 1910: 136, *Arctica aulica ab. hannata*
Spuler, 1910: 136, *Arctica aulica ab. radiata*
Seitz, 1913: 95, pl. 17, rows e, f, *Hyphoraia aulica*
Matsumura, 1927: 59, pl. 4, fig. 3, *Hyphoraia aulica riskiriensis*
Dubatolov, 1996b: 47, *Hyphoraia aulica*
**Description.** Alar expanse of male 31-35 mm, female larger (37-40 mm). Fw brown with a yellow pattern consisting of longitudinal short lines and points. Hw yellow with black spots and a darkened basal part. A large black spot on discoidal vein. Pattern of underside same, but black coloration of hw replaced by brown.

**Variability.** Basically connected with an increased or weakened yellow pattern. Moths from the Primorye are larger and lighter than European specimens.

- **f. testudinarioides.** Differs by the development of yellow fields on the hws, this making the moth look similar to the West European *H. testudinaria* (Geoffroy, 1785).

- **f. immaculata.** Monochromous brown fws and yellow hws without black maculae. A transitional form, *hamata* Spuler, 1910, is also known. One of the numerous deviations, **f. radiata** Spuler, 1910, shows fused yellow maculae situated along the hind edge of the fw. Such a trait is a constant feature of *H. dejeani* (Goddart, 1822), from Spain.

**Distribution.** Pattern Euro-Siberian.

Within the former Soviet Union. European part: Baltic countries; Belarus; Ukraine (in the Crimea not recorded); Moldova, European Russia south of 62 °N in the western part (southern Karelia and Kirov), up to 57 °N in the Urals; Uralsk (Zhuravlev, 1909); Caucasus and Transcaucasia (Georgia); in West Siberia from 55 °N down to northern Kazakhstan (Tyumen, Omsk, Novosibirsk, Minussinsk, Barnaul, Kuznetskiy Alatau, the middle flow of Angara River, Semipalatinsk), further to the east in southern Transbaikalia, in Amurland and Primorye.

Beyond the former Soviet Union. Central Europe (southern Belgium, southern Scandinavia and eastern France, Germany, in the south down to Austria, northern Balkans; northern Asia Minor; China (Xinjiang, Heilongjiang, Liaonin); Korea; Japan (Hokkaido).

**Biology.** Flight from the end of May to early July on warm slopes, wastelands, forest alleys and wet forest lawns. Occurrences patchy. Caterpillar black, coated with straw red hairs (Fig. 29). Last three segments with especially long black hairs. Head black. Length of last-instar caterpillar up to 50 mm.
Larvae feeding from August on various herbaceous plants: *Achillea*, *Euphorbia*, *Potentilla*, *Hieracium*, *Cynoglossum*, *Deschampsia*, *Plantago*, *Taraxacum*, *Calamagrostis* etc. Hibernation twice. Pupa black with red-brown grooves on abdomen in a thin white cocoon.

**Similar species.** There seem to be no similar species in our fauna.

### 17. Genus *Pararctia* Sotvalta, 1965


Moths of medium size. Wing pattern of Type I. Fw brown with a yellow pattern, hw yellow with dark spots. Eyes oval, antennae of male bipectinate, coated with hairs.

Distribution pattern circumpolar (Europe, Asia, North America, including Canada). From North America, the following species are known:

*Pararctia yarrowii* (Stretch, 1873), *Pararctia subnebulosa* (Dyar, 1899), and several subspecies of *Pararctia lapponica*.

Keying the species based on external features is often difficult as the congeners are very similar and often show strong variability.

**Key to species of *Pararctia***:

1. Fw light brown with small yellow maculae situated at costal and hind edges of wing. A discontinuous light stria along external edge. ................................................................. *P. lapponica*

   – Yellow maculae merged to form two transverse belts, latter bridged in middle part to form an X-shaped pattern in external part of wing. ........................................................................................................ 2

2. Edge of hw yellow. Dark spots a little removed from edge. Alar expanse 44-46 mm. ....................... *P. lemniscata*

   – Edge of hw infuscate, with a dark band at edge. Alar expanse 34-36 mm. .................................................. *P. tundrana*
26. *Pararctia lapponica* (Thunberg, 1791)

(As Eudamia in Pl. 25, Fig. 14)


[= *festiva* Borkhausen, 1790; *avia* Hübner, 1804; *festiva rosea* Sheljuzhko, 1929].

*Pararctia lapponica* – Lapponian (Lat.)
Lappländischer Braunbär – (Germ.)

Seitz, 1910: 95, pl. 17, row e, *Hyphoraia festiva*
Bang-Haas, O., 1927: 68, *Hyphoraia lapponica lapponica*
Dubatolov, 1996b: 47, *Pararctia lapponica*

Description. Alar expanse 37-39 mm. Wing coated with rather sparse scales. Fw red-brown with yellow prolate spots adjoining both costal and inner edges, and an irregular boundary band. Hw in basal part dark brown, in external part intensively yellow, with dark submarginal spots. External edge yellow.

Variability. This moth seems to be infrequent in collections. From the boreal coast of Kola Peninsula, Russia, the form *rosea* has been described as *Hyphoraia festiva rosea* Sheljuzhko, 1929. It is distinguished by pink red hws.

Distribution. Pattern circumpolar.

Within the former Soviet Union. Polar regions of European Russia: Kola Peninsula, Mesen, Kanin Peninsula, Polar Urals, Yamal Peninsula, Taimyr Peninsula, in the south down to Igarka; East Sayan Mts; the mountains of Transbaikalia, Stanovoi Mts., Yakutia; Magadan Region; Chukotka; Wrangel Island, Kamchatka.

Beyond the former Soviet Union. Northern Scandinavia, North America (Alaska; northwestern Canada to Quebec in the east). Two Nearctic subspecies have been discriminated: ssp. *hyperborea* (Curtis, 1835) and ssp. *gibsoni* (O. Bang-Haas, 1927).

Biology. Flight at the end of June and in July in the tundra (Fig. 30). In woodlands, occurring over “goltsy” (= rocky denudations) and moors. Larva dark gray with a small black head and long blackish hairs. Feeding on *Betula nana*, *Vaccinium uliginosum*, *Rubus chamaemorus*.

Similar species. *P. lemniscata* Stichel, larger, the belts are much wider, the external part of the fw is with an X-shaped pattern; *P. tundrana* Tshistjakov, smaller, hws duller with a wide brownish border.

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**Fig. 30.** Polygonal tundra in the region of Indigirka River, Taimyr Peninsula, Russia, with *Holoarctia puengeleri* O. B.-H., *Pararctia tundrana* Tshist., *P. lapponica* (Thunb.), *P. lemniscata* (Stich.), *Acerbia alpina* (Q.) flying during a short polar summer (photo A. Grazhdankin).
27. *Pararctia lemniscata* (Stichel, 1911)

*(Pl. 5, Figs 16, 18)*


[*lemniscata* – decorated with band (Lat.)]

Alpheraky, 1897: 198, pl.14, row 8, *Arctia festiva*

Sheljuzhko, 1922: 286, pl. 5, fig. 5, *Hyphoraia lapponica lemniscata*

Bang-Haas, O., 1927: 68, *Hyphoraia lapponica lemniscata*

Dubatolov, 1996b: 48, *Pararctia lapponica lemniscata*

**Description.** Male: alar expanse 40-45 mm. Fw light brown with yellowish belts, latter in external part of wing forming an R- or X-shaped pattern. Centre of costal edge with a wide light spot. Hw yellow with several submarginal spots or striae, a large discoidal spot and a darkened hind edge. Basal part of hw gray.

**Variability.** *P. lemniscata* is often considered as a subspecies of *P. lapponica*. The status of a number of varieties described as forms of *P. lapponica* remains vague. The type locality of *P. lapponica* is the River Vilyui, Transbaikalia. Conditionally, as we have neither a sufficiently rich material nor enough observations to solve this problem, the following forms are being attributed to *P. lemniscata*:

1. *diplosema* Stichel, 1911: 98. Smaller, also it seems lighter because of strong downiness; postdiscal belts forming X- or R-shaped patterns;


**Distribution.** Pattern East Siberian.

Within the former Soviet Union. Mountains of eastern Yakutia (Suntar-Khayata and Cherskiy mountains), Vilyui River, Tunkinskie Belki, Sayan Mts, Irkutsk, Indigirka River (A. Grazhdankin leg.), Altai (L. Nikolaevskiy leg.).

Beyond the former Soviet Union. Unknown.

**Biology.** Flight from the end of June and in July in the northern taiga and forest-tundra.

**Similar species.** *P. lapponica*, *P. tundrana*. See the key above.


*(Pl. 5, Fig. 17)*

Tshistjakov, 1990: 97, figs 1-3, TL: Chukotka.

[*tundrana* – living in the tundra (Lat.)]

**Description.** Alar expanse 35 mm. Fw brown with pale yellow, irregularly shaped striae and separate spots. In external part of fw, the intersecting belts forming an R-shaped pattern. Closer to the base of fw at its hind edge, a spot in the form of a lying letter y, and costal edge in the middle of fw with an l-shaped pattern. A similar pattern also at base of wing. A triangular light spot between these two l-shaped patterns. Hw yellowish with a pale brown-gray pattern; anal part of wing darkened, external edge of fw with a marginal belt (with a light spot below vein Cu2) and a crescent spot on discal vein. Fringe light, body brown. The above description is given based on a specimen from Chukotka.

**Variability.** Details of wing pattern varying.

**Distribution.** Pattern North Siberian.

Within the former Soviet Union. Polar Urals; Yamal; Taimyr; Polar Yakutia; mountains of southern Yakutia (Stanovoy Mt. Range): Chukotka; northern Koryakia, Kamchatka.

Beyond former Soviet Union. Unknown.

**Biology.** Moths inhabiting the tundra belt, flight in July.

**Similar species.** *P. lapponica* and *P. lemniscata* show a light external edge of the hw; *P. lemniscata* larger (40-45 mm).

**Note.** Earlier, the North American species *P. subnebulosa* (Dyar, 1899) was considered as occurring over our territory. However, Tshistjakov (1990) has shown that our moths actually belong to *P. tundrana*, a Siberian vicariant of *P. subnebulosa*. 
Genus *Sinoarctia* Dubatolov, 1987


“Eyes small, oval, bare, antennae of male two-combed, in female simple. Proboscis small. Body rather wide, coated in males with rich erect hairs, in female with decumbent scales. Fore tibiae with a short epiphysis, middle with one pair, hind with two pairs of thin spurs, which are not longer than diameter of tibiae...” (Dubatolov, 1987a: 30).

The following four species belong to this genus: *S. kasnakovi* (Dubatolov, 1987) (upper reaches of the Yantze River), *S. sieversi* (Grum-Grshimaïlo, 1891) (China, Qinghai, Amdo), *S. forsteri* (Daniel, 1943) (Sichuan), and *S. mussoti* (Oberthür, 1911) (Tibet).

Pattern of fw represented by longitudinal bands along veins R, Cu and A2 + A3, and also by a V-shaped spot in external field. In male, external edge infuscate. Hws pink, yellow or white with dark spots along external edge and on discal vein. Veins Cu1-2 and 2 + A3 darkened at base.

The holotype of *S. kasnakovi* was taken by Kozlov in the headstream of By-tchu River (probably near Ushu - 33°06' N, 96°48' E in Qinghai Province, eastern Tibet) at 4500 m a.s.l., 11. VII.1900, while the paratypes in the same area (Djagyngol River) by Kaznakov and Kozlov on 1-7.VII.1900, “on flowers on an Alpine aster” (?). Both the holotype and the paratypes are kept in ZISP.

*S. sieversi* (Grum-Grshimaïlo), a male and a female from China, see Pl. 24, Fig. 1, †, Fig. 2, ‡ (wingless, presumably the same species).

No representatives of this genus have hitherto been documented in the territory of the former Soviet Union.

18. Genus *Borearctia* Dubatolov, 1984

(Genitalia in Pl. 25, Fig. 15)


Dubatolov (1984) erected this genus on the basis of certain differences from *Callimorpha*.

Head small, palps short, coated with decumbent hairs. Proboscis developed, rolled into a spiral. Antennae of male saw-shaped, in female simple. Eyes small, oval, coated in hind part with light hairs. Middle tibiae with one, hind tibiae with two pairs of pointed spurs, or calariae. Wings semi-transparent.

Below, the original description of the genus is quoted:

“The genus *Borearctia*: head small, palpi small, hardly longer than downiness on face, coated with long semidecumbent hairs. Proboscis not reduced, coiled into a spiral, in full stretch reaching the apex of hind coxae. Antennae in male styliform, in female simple, filiform.

Face wide, beset with long erect hairs; eyes small, oval, eye width to eye height ratio 0.6-0.8, coated with light hairs, denser in hind part of eye, missing in fore part. Thorax and fore segments of abdomen coated with dense long hairs, remaining parts of abdomen with short decumbent setation. Coxae of legs with long, femora, tibiae and tarsi with short decumbent hairs. Middle tibiae with one, and hind tibiae with two pairs of pointed spurs, or calariae, latter equal in size to or slightly longer than diameter of tibiae. Wings semi-transparent, fw prolate toward apex.

Male genitalia: valve strongly sclerotised, oval, with basal edge declined inside and coated ... with short sparse hairs. Valve at apex with a long cylindrical process. Uncus cylindrical, without hairs. Branches of transtilla well-developed, covered with denticles at apices. A membranous basal process of valve missing. Female genitalia with strongly sclerotised side processes on antevaginal plate, latter scale-free, and with a large sinus vaginalis.

Palps in *Eyprepia menetriesi* coated with yellow or red hairs, at apex black. Face between eyes with black hairs, forehead (epicranium) and neck between and behind antennae clothed with red hairs. A small fascicle of black hairs between antennae. Patagia with black hairs, the hairs being white only at base but red at apex. Tegula outside downy white, inside with black hairs. Prothorax in the middle coated with black hairs, on each lateral side with white hairs. Abdomen yellow from above, each segment in central part with a large, transverse, black spot, underside of each abdominal segment black in front, yellow behind. Antennae black, legs from above black, underside yellow, only fore coxae and femora, as well as middle femora with red hairs; red fascicles of hairs at base of upper side of fw.

Fw yellow, bordered brown-black along veins. Hw orange yellow. Pattern of underside of wing same as on upper side, but more dull while costal edge of fw red.” Length of fw 30-35 mm.

Closest to *Pararctia* Sotavalta, with a single species involved.
29. Borearctia menetriesi (Eversmann, 1846)

(Pl. 6, Fig. 1)

Eyprepia [sic!] menetriesi Eversmann, 1846: 84, TL: “Songoria” (Dzungaria=Jungaria).

[menetriesi – in honour of Ed. Ménétriès (1802-1861), Russia’s first professional entomologist of French origin]

Dubatolov, 1984: 337-339, Borearctia menetriesi
Hori, 1926: 86-87, Callimorpha menetriesi

Description. Alar expanse 56-65 mm. Fw yellow bordered black, with brown-black striae on veins. Hw orange yellow with a red field at apex of wing and with black pollination on veins thinner than on fw. Antennae of males dentate, in female simple. On underside, pattern the same but costal edge of fw red.

Variability. The small series of specimens known to us is rather stable in appearance.

Distribution. Pattern Euro-Siberian. Based on the literature data, the moth ranges from Finland and Karelia (northwestern coast of Lake Ladoga) to Sakhalin, but is extremely rare in collections.


Beyond the former Soviet Union. Finland, northwestern China (Xinjiang).

Biology. Flight in July over taiga glades and “goltsy” (= mountain tundra). Flight prompt, rectilinear. Based on certain observations, the food plants of caterpillars are Polygonum, Plantago, Taraxacum.

Note. A revision of this species by Dubatolov (1984) was based on a study of 15 specimens (2 males and 13 females).

Similar species. There seem to be no similar species in our fauna, though some resemblance can be found with Callimorpha principalis principalis Kollar, 1844, in which the hw pattern reminds of that of B. menetriesi. However, the typical subspecies of C. principalis does not occur in our territory.

19. Genus Acerbia Sotavalta, 1963


Wing pattern of Type I. Fw dark gray with numerous, light, diffused spots. Basal part of hw dark. Eyes bare, antennae dentate.

30. Acerbia alpina (Quensel, 1802)

(Pl. 6, Fig. 1)

Bombyx alpina Quensel, 1802: 253, TL: Lappland.

 [= thulea Dalman, 1823: 92]

[alpina – alpine (Lat.)]

Spuler, 1910: 137, Arctia alpina
Seitz, 1910: 95, pl. 17, row a, Hyphoraia alpina
Bang-Haas, O., 1927: 70, Hyphoraia alpina sibirica
Dubatolov, 1996b: 48, Acerbia alpina

Subspecies:
A. a. sibirica O. Bang-Haas, 1927
A. a. johanseni O. Bang-Haas, 1927.
**Description.** Alar expanse about 40 mm. Fw dark gray with medium-sized white spots, rounded and prolate along wing. Hw mainly dark gray. One-third of hw in its external part yellow, toward costal edge reddish. On a yellow field, spots of the same colour as basal field. On discal vein, a soft crescent spot. Scaly integument both on fw and hw rather sparse, the scales arranged in regular rows, not overlapping. Body black as well as head; collar and shoulders yellow. Legs black with yellow maculae. Antennae slender.

**Variability.** Coloration of hw varying from red to yellow.

The ssp. *sibirica* from the Altai (Pl. 6 fig. 5) slightly differs from the samples from Scandinavia. (“Wings thinner and prolate, colour of hw dingy rosy”, cf. O. Bang-Haas, 1927).

The form from Alaska, the ssp. *johanseni*, is very close to the ssp. *sibirica*.

**Distribution.** Pattern circumpolar.

Within the former Soviet Union. North of Russia: Polar Urals, Yamal, polar areas from the Taimyr to Chukotka peninsulas, Wrangel Island, Altai, Sayan, Buryatia, Dzhugdzhur and Stanovoy Mt. ranges, eastern Yakutia. Beyond the former Soviet Union. Fennoscandia; Mongolia (Chovsogol Region, Kharidullin Mt. Range); Alaska, Yukon, Canada.

**Biology.** In the Altai and other parts of Siberia, the moth inhabits alpine regions, where it can be seen in the daytime on seers while resting on stones. In the Altai Mts, it occurs at 2500-3000 m a.s.l.

Food plants of caterpillars: *Taraxacum*, *Vaccinium*, *Salix herbacea*.

**Similar species.** Superficially resembling *A. seitzi*, in which light spots on fw ochre-yellow, hw orange yellow with small darkening at base, and dark maculae more strongly contrasting than in *A. alpina*. Underside background coloration orange.

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**31. Acerbia seitzi** (A. Bang-Haas, 1910)

*(Pl. 6, Fig. 2)*


[= *strandi* Niepelt, 1911; *niepeltiana* Strand, 1919]

[seitzi – in honour of German entomologist A. Seitz]

Bang-Haas, O., 1927: 70, pl. 9, fig. 4, *Hyphoraia seitzi khumbeli*

Dubatolov, 1996b: 49, *Acerbia seitzi*

Subspecies:

*A. s. khumbeli* O. Bang-Haas, 1927.

**Description.** Male: alar expanse 45 mm. Fw yellow with an indistinct black-and-gray pattern in the form of diffused transverse bands and darkened veins. Hw orange with black submarginal maculae and a crescent median spot. Underside orange with a black discal spot on fw. Pattern of underside of hw same as from above.

**Variability.** A series of ten specimens from Pass Kumbel near Alma-Ata (ssp. *khumbeli* O. Bang-Haas) shows no considerable variability. From the typical form they differ by a lustreless yellow colour of the maculae on the fws. The hw are lustreless red in colour.

The single male specimen available from the Ugamskiy Mts (Uzbekistan, Ugamskiy Mt. Range, Sairam-Su River, 17.VII.1986, T. Tillaev leg.) represents a sharply deviating melanistic form similar to a number of melanists in other species. We describe it below as a new form.

*f. tillaevi* forma nova (Pl. 6, Fig. 3).

Male: alar expanse 44 mm, length of fw 21 mm. Upper side of fw gray-brown with yellow pollination generating vague belts. Hw black. Underside of fw orange-yellow with three black maculae at costal edge and two more placed closer to anal angle of fw. Hw black with a bright yellow fringe. Body from above black except for a fascicle of yellow hairs at apex of abdomen.

Named in honour of amateur entomologist T. Tillaev, Tashkent, Uzbekistan.

**Distribution.** Pattern Central Asian.

Beyond the former Soviet Union. China (Xinjinag; Tian-Shan).

**Biological.** Mainly inhabiting talus and adjacent alpine grassy lawns at 2800-3200 m a.s.l. Flight in the afternoon in July. Caterpillars black, coated with black or dark gray hairs, in the daytime hiding under stones. Feeding on herbaceous plants (in captivity they ate *Taraxacum*).

Caterpillars hibernating at the last instar. After overwintering, they pupate without additional feeding.

**Similar species.** *A. alpina* has dark gray fws with clear-cut white maculae. Most parts of the hw and the wing underside are obscure. Both these species never occur together.

*Acerbia kolpakofskii* (Alpheraky, 1882)

*Callimorpha kolpakofskii* Alpheraky, 1882: 26, pl. 1, fig. 31, TL: River Kunğess, Tian-Shan. “In der Nähe des Flussus Kunğey (Kounguesse)”.

[kolpakofskii – after Mr. Kolpakofski]

Seitz, 1910: 95, *Hyphoraia kolpakofskii*

Bang-Haas, O., 1927: 70, *Hyphoraia kolpakofskii*

**Note.** This moth is known to us based on brief descriptions only. Seitz (1910) puts it between *Hyphoraia seitzi* and *Hyphoraia radica*. O. Bang-Haas (1927), by assigning this species to *Hyphoraia*, also considers it as close to or even a synonym of *H. seitzi*.

**Description** (after Seitz, 1910). Antennae of male two-combed. Fw coated with sparse scales, with white spots scattered all over the wing. Hw ochre yellow. Base reddish with small black maculae at edge and three larger ones at anal angle, before apex and at inner edge. Thorax and abdomen black-brown.

Superficially, the moth thus resembles *A. seitzi* or *A. alpina*.

**Variability.** Apparently, only a single, holotype specimen is known. As noted by O. Bang-Haas (1927), *A. seitzi* is probably a synonym of this species.

**Distribution.** The moth has been described from China, yet rather close to the border to Kazakhstan (Kunğess River at the confluence with Tekes River forming the Ili River).

**Biology.** The holotype was found on the stem of a dry tree on 9.06.1879 at about 1300 m a.s.l.

**Similar species.** *A. seitzi* has reddish pink hws.

20. **Genus Platarctia** Packard, 1864

*Platarctia* Packard, 1864: 109, TS: *Arctia parthenos* Harris, 1850.

Moths of medium size. Wing pattern of Type I. Fw violet brown with a pattern of yellow maculae. Eyes large, hemispherical, not situated on a bare suborbital sclerite. Male genitalia: valva with one apical process only.

One species within the former Soviet Union, two species in North America.

32. **Platarctia atropurpurea** (O. Bang-Haas, 1927)

[Pl. 6, Fig. 6]

*Hyphoraia ornata atropurpurea* O. Bang-Haas, 1927: 117, TL: environs of Ulan-Bator (Urga), Mongolia; “Umgebung der Stadt Urga” (südlich Kiaehla)”.

[= *ornata* Staudinger, 1896]
[atropurpurea – black-purple (Lat.)]

Seitz, 1910: 101, pl. 18, row f, Hyphoraia ornata
Draudt, 1931: 83, pl. 7, row d, Hyphoraia ornata pallida
Bang-Haas, O., 1927: 117, Hyphoraia ornata atropurpurea
Dubatolov, 1996b: 49, Platarctia atropurpurea
Dubatolov, 1996b: 70, fig. 2g, Platarctia atropurpurea sotavaltai

Subspecies:
P. a. pallida Draudt, 1931
P. a. sotavaltai Dubatolov, 1996.

Description. Alar expanse 40 mm. Fw violet-brown with yellow maculae, hind edge of fw dark. Basal field above this edge yellow with dark points. Along costal edge, four yellow maculae (spot closest to base of fw partly merged with basal field; spot at apex like an oblique short line). Along external edge, a series of spots (three fore spots smaller). Two spots closer to hind edge of fw. Hw yellow with a darkened external edge and a median spot. Submarginal series of spots and inner edge also darkened. Underside pattern similar.

Variability. Coloration and size of spots variable.
The following subspecies are known:
ssp. pallida. Chita: hws whitish with weak gray pollination;
ssp. sotavaltai. E. Yakutia, 180 km NE of Khandyga.

According to the original description, alar expanse of female 33-38 mm, of male 32 mm. Fw grayish brown with a typical pattern. “The main character of the new subspecies is the size of the yellow antemedian and postmedian spots in the space 1 (between veins 2A and Cu2) on the fw. These spots are small, either of equal size or the antemedian spot being smaller than the postmedian one. P. atropurpurea atropurpurea has a large antemedian spot in the space 1, elongated between the veins, and usually this spot is twice as long as the postmedian one. In addition, the hw in the new subspecies has separate rose spots, being brighter in the females.”

The form (ssp.? from Chukotka (P. I. Beda leg.) differs by the orange background colour of the hw (Fig. 31). The moths from central Yakutia show a tint intermediate between the yellow Altai and the orange Chukcha specimens. V. A. Ganson (in litt.) noted this difference.

Distribution. Pattern East Asian.
Within the former Soviet Union. West Siberia (Yenisey River, isolated records), Altai, East Sayan, Chita Region, southern and eastern Yakutia, Magadan Region, Chukotka.
Beyond the former Soviet Union. Mongolia, China.

Biology. Flight in June in alpine and partly in the upper forest belt (in the Altai from 1700 up to 2100 m a.s.l.). Flying in daytime and to light.

Similar species. No similar species seem to inhabit our countries.

21. Genus *Oroncus* Seitz, 1910

*Oroncus* Seitz, 1910: 82, TS: *Phragmatobia urania* Püngeler, 1904.

Bang-Haas, O., 1927: 60, *Oroncus*

Adults of this genus differ by the dark colour of the fw with a bright white or yellow stria along the costal edge. Hw yellow or red. Females often rest open on stones. Males promptly sweep along steep taluses high in the mountains at about 4000 m a.s.l.; flight during the day. High-montane.

O. Bang-Haas (1927) referred all forms of this genus encountered over the territories in question to one species, *O. tancrei* Staudinger. However, the noticeable differences in the patterns of separate forms allow to assume a specific status of some of these forms. Highly provisionally, four species considered by O. Bang-Haas as subspecies can be delimited. In addition, this genus also contains *O. secreta* Draudt, 1931, from northern Gansu (Nord-Kansu), China (Draudt, 1931), *O. bieti* (Oberthür, 1883), from Ta-chin-lu (Kanding), southeastern China, and *O. elisabethae* Kotzsch, 1938, also from China. To review or revise *Oroncus*, more material must be considered.

Key to species of *Oroncus* (Fig. 32):

1. Hws pink. ................................................................................................................................................................... 2
   –. Hws yellow. ................................................................................................................................................................. 3

2. A white stria extending from the end of a white band at costal edge to hind angle of fw. Apex of fw without a white short line. .................................................................................................................................................... 3
   –. A white band beginning near apex of fw and running parallel to external edge with a small flexure in upper part. ...
   ........................................................................................................................................................................... 3

3. Apex of fw on underside black with white points. .......................................................................................
   ........................................................................................................................................................................... 3
   –. Apex of fw on underside with three black short lines over a light background. ............................................. 3

The modest quality of the illustration is only due to the relatively poor quality of an old original picture.
33. *Oroncus tancrei* (Staudinger, 1887)

(Pl. 6, Fig. 10; Fig. 32: 1)

*Arctia tancrei* Staudinger, 1887: 81, TL: Tian-Shan, “Issyk-Kul, Sulucka”.

As there seems to be no place like “Sulucka” in the Tian-Shan, O. Bang-Haas assumed that be a misspelt “Souka Pass” situated on the road Przevalsk–Aksu, also a watershed of the Issyk-Kul and Naryn catchment areas.

[tancrei – in honour of entomologist Tankre]

Bang-Haas, O., 1927: 60, *Oroncus tancrei*

**Description.** Alar expanse 35-40 mm. Fw black, costal edge white almost up to apex, latter with a white short line. A white indistinct stria running from the end of a white costal band to anal angle of fw (Fig. 32). Hw red or pink, yellowish toward fore edge, with a black crescent spot on discal vein and with prolate spots along peripheral edges.

**Variability.** Based on limited material, generally insignificant.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. West Pamirs (Dzhilandy), Central Tian-Shan, Dzhungarskyi Alatau Mts (?).

Beyond the former Soviet Union. Xinjiang: mountains north of Korla and near Aksu (Püngeler, 1904) (= *urania* Püngeler according to Dubatolov, 1996b).

**Biology.** Flight at great heights (4000 m a.s.l. and above) on large stony taluses. Females usually resting openly on stones; males can be seen volant in the daytime. Eggs rather large, ball-shaped, white. Last instar caterpillars black with black warts and thick fascicles of black hairs. Fed on dandelion (*Taraxacum*) during lab rearing. Caterpillars hibernating, pupating without additional nutrition in spring with an approaching warm weather.

**Similar species.** *O. urania* differs by the yellow hw and the pattern on the fw, i.e. the transverse belt running not from the end of the costal, white, short line, but from the apical spot.

**Note.** According to O. Bang-Haas (1927), *O. tancrei* is so close to *Arctia flavia* (Fuessly) that both species are to be referred to a separate genus, or to assign *A. flavia* to *Oroncus*. However, this point of view seems insufficiently well-grounded, as the male genitalia of *Arctia* and *Oroncus* are too different.

34. *Oroncus urania* (Püngeler, 1904)

(Pl. 6, Figs 8-9; Fig. 32: 2)


[urania – Uranus, one of the supreme gods in ancient Greek mythology, personified heavens (Gr.)]

Bang-Haas, O., 1927: 61, *Oroncus tancrei urania* ab. *neptunus*

Bang-Haas, O., 1927: 61, *Oroncus tancrei urania* ab. *fulminans*

Bang-Haas, O., 1927: 61, *Oroncus tancrei urania* ab. *famosa*

**Description.** Superficially close to *O. fasciata* O. Bang-Haas, 1927, perhaps both forms actually represent one and the same species.

**Variability.** O. Bang-Haas (1927) described a series of forms he referred to urania:

- f. *neptunus* (Fig. 32: 2) has a continuous oblique belt running from the end of a white costal edge to the external angle, and connected to the apical belt;
- f. *fulminans* with a red hw;
- f. *famousa* has a smoky brown hw.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Central Tian-Shan [“high in the mountains north of Aksu, Hahn-Tengry” (O. Bang-Haas, 1927)], Inylehke Mt. Range.

Beyond the former Soviet Union. China, Aksu (Kokshaal Tau Mt. Range).

**Biology.** Flight in July above stony taluses at about 4000 m a.s.l. Flight rectilinear and rash. Female resting openly on stones. Moths from the crest of Inylehke Mt. Range, about 4000 m a.s.l., flying in July in the daytime.
Similar species. *O. tancrei* has a yellow hw. On fws, the marginal belt is sinuous and generally runs parallel to the external edge.

### 35. *Oroncus fasciata* O. Bang-Haas, 1927

(Fig. 32: 3-4)

*Oroncus tancrei fasciata* O. Bang-Haas, 1927: 61, pl. 8, fig. 17 (†), TL: “Tianchan sept.: Dsharkent” [Kazakhstan, Dzharkent]. (Probably the high-mountainous parts of Dzungaria, in lowlands this moth does not seem to occur).

[ fasciata – decorated with belts (Lat.) ].

**Description.** Alar expanse of 37-40 mm. Fw black with a white band along costal edge. A white band running along external edge and curved outside in fore half of fw. Hw yellow with a crescent median spot and two prolate submarginal spots.

**Variability.** Modest.

ab. *pura* O. Bang-Haas, 1927: 61 – hws without dark spots (Fig. 32: 4). Dzharkent (Yarkand).

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Dzhungarskiy Alatau Mts., northeastern Tian-Shan.

Beyond the former Soviet Union. Unknown.

**Biology.** Flight in July at high elevations (4000 m a.s.l.).

**Similar species.** *O. tancrei* has a white stroke at fw apex.

### 36. *Oroncus alaica* O. Bang-Haas, 1927

(Pl. 6, Figs 11-12; Fig. 32: 5, 6; genitalia in Pl. 26, Fig. 1)

*Oroncus tancrei alaica* O. Bang-Haas, 1927: 61, pl. 8, figs. 19-20, TL: Alaisky Mt. Range.

Fig. 33. Kirghizia, Alai Mts, Dugoba-Shigou Canyon, 3500 m, place of occurrence of *Palaearctia gratiosa* (Gr.-Gr.), *P. fergiana* (Stgr.), *Oroncus alaica* O. B.-H., *Arctia rueckbeili* (Pngl.) and some others (photo by V. S. Murzin).
Description. Male: alar expanse 38-42 mm. Fw with small residual subapical belt or latter completely missing, with black spots at costal edge inside a white band. An oblique belt often interrupted in the middle running from the end of costal band to anal angle. Hw pink with usual black spots. Abdomen black with a yellow band on lateral sides and from below.

Female larger (up to 50 mm), with a white collar.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Alaiskiy (sources of Dugoba River) and Zaalayskiy Mt. ranges (Aram-Kungey), West Pamirs (Dzhilandy).

Beyond the former Soviet Union. Unknown.

Biology. Flight in July at about 4000 m a.s.l. Last instar caterpillar black, coated with long rich hairs on black warts, last instar hibernating. Lab cultures fed on leaves of dandelion (Taraxacum).

Similar species. Both *O. fasciata* and *O. tancrei* show a sinuous transverse belt running parallel to the external edge.

Genus *Orontobia* de Freina, 1997


Within this genus which is clearly Chinese-Tibetan and Central Asian in origin, the following taxa are accepted: *Orontobia coelestina* (Püngeler, 1904), *O. dalailama dalailama* de Freina, 1997, *O. dalailama kansuensis* de Freina, 1997, *O. taglangla* de Freina, 1997 and *O. mooseri* de Freina, 1997. Almost all of these species or subspecies have recently been described from China, except for *O. coelestina* (Püngeler, 1904) (Fig. 20) which was earlier referred to the genus *Phragmatobia*. According to de Freina (1997), *coelestina* is known from Altyn-Dagh Pass in Kazakhstan. Thus, had this been correct, the genus would appear relevant to the scope of the present paper. However, the locality name Altyn-Dagh, meaning “a gold mountain”, is very common in Central Asia and can even prove to actually concern the Altyn-Dagh Mt. Range lying in China. Nevertheless, for the sake of completeness, this genus is treated here as well.

By its features (Pl. 24, Fig. 8), *Orontobia* seems to lie between *Phragmatobia* Stephens, 1828 and *Oroncus* Seitz, 1910. The proboscis is present, but it is less strongly developed than in *Phragmatobia*. The antennae are virtually filiform, only weakly dentate, ciliae on the palps extremely long, considerably longer than in *Oroncus* and *Phragmatobia*. The head is convex but rather small; the apex of the wings (Fig. 34) is strongly rounded. The venation of the fw is

![Fig. 34. Wing venation in Orontobia species (male) (after de Freina, 1997).](image-url)
characterised by very short radial veins positioned on a common pedicel. The moth is unique in the venation of the hw: Se + R1 not merging anywhere with R. The male genitalia resemble those of representatives of Oroncus. The appearance of some species also reminds of Oroncus due to the light band along the costal edge. The moths fly high in the mountains above taluses in the daytime.

Genus Preparctia Hampson, 1901

Preparctia Hampson, 1901: 219, TS: Chelonia mirifica Oberthür, 1892.

Species of this genus (Pl. 24, Figs 10-11) are known from China (Tibet, Sichuan, Gansu) and northwestern India (Kumaon). At the moment, six species are recognised: P. romanovi (Grum-Grushimaïlo, 1891) (Amdo, NE. Tibet), P. allardi (Oberthür, 1911) (Tibet), P. mirifica (Oberthür, 1892) (Sichuan), P. buddenbrocki Kotzsch, 1929 (Gansu) (= Preparctia biedermanni O. Bang-Haas, 1932/33), P. hanningtoni Hampson, 1901 (Kumaon), and P. cupido Kishida, 1995 (Nepal).

Wing pattern of Type I. P. romanovi and P. allardi are characterised by the yellow hws (orange in basal part) and the subterminal yellowish belt on the fw, the belt sharply curved inside in the middle and reaching a postmedian belt. P. mirifica and P. buddenbrocki also show a strongly angulate subterminal belt on the fw, but the hws are crimson or dark red instead of yellow (Kishida, 1995).

Over the territory of the former Soviet Union, no species of this genus are known to occur.

22. Genus Arctia Schrank, 1801

Arctia Schrank, 1802: 152, TS: Phalaena caja Linnaeus, 1758.

= Eyprepia Oehsenheimer, 1810: 299, TS: Phalaena caja Linnaeus, 1758
= Euprepia Hübner, 1819: 181 (misspelling)
= Zoote Hübner, 1820: 181, TS: Phalaena caja Linnaeus, 1758
= Chelonia Godart, 1822: 299, TS: Phalaena caja Linnaeus, 1758
= Callarctia Packard, 1864: 114, TS: Phalaena caja Linnaeus, 1758
Moths of medium size, coloration variegated; fw prolate; eyes large and spherical; palps short, with a reduced last segment. Wing pattern of Type I. An accessory cell on fw, this feature variable. Fw with 12 veins; proboscis weakly developed, almost invisible in males but visible in females. Antennae of male double-combed, in female dentate. Middle tibiae with one pair, hind tibiae with two pairs, of spurs (calariae). Male genitalia with uncus tapering at apex, without lamellae.

There seem to be five species occurring in our fauna. Dubatolov in Abdashitova et al. (1996) has recorded Arctia ladakensis O. Bang-Haas, 1927 in Kirghizia. This species is known from the basin of Aksu River, China, which in the lower flow represents Sarydzhaz River, Kirghizia, Tian-Shan. Possibly, the species can indeed be present in our territory similarly to Parnassius loxias.

Dubatolov, 1990e has described the genus Atlantarctia Dubatolov, 1990e, as close to Arctia. No representatives of this genus have hitherto been encountered in the former Soviet Union.

Key to our species of Arctia:
1. Band Ls (see Fig. 9) in middle part of fw missing. ................................................................. 2
   – Band Ls present. .............................................................................................................................. 4
2. The white lines on fw solid. .............................................................................................................. 3
   – The white lines on fw broken into separate spots. ........................................................................ 4
3. Hws red. ......................................................................................................................................... 4
   – Hws yellow. ................................................................................................................................. 5
4. Eyes orbicular (Fig. 37: 1). .............................................................................................................. 6
   – Eyes oval (Fig. 37: 2). .................................................................................................................... 7

Fig. 37. Heads of Arctia caja (L.) (1) and A. olschewangi Dub. (2).
37. *Arctia intercalaris* (Eversmann, 1843)

(Pl. 7, Figs 1-3)

*Euprepia intercalaris* Eversmann, 1843: 544, pl. 10, figs 1a, b, TL: Dzungarskiy Alatau (Kazakhstan).

**[intercalaris – intercalary (Lat.)]**

Bang-Haas, O., 1927: 72, pl. 9, figs 7-9, *Arctia intercalaris alpherakyi*

Seitz, 1910: 98, pl.18 row a, *Arctia intercalaris*

Dubatolov, 1996b: 51, *Arctia intercalaris*

Subspecies.

*A. i. boettcheri* O. Bang-Haas, 1927

*A. i. alpherakyi* Staudinger, 1886: 258 (= *Arctia intercalaris badakhshana* Wiltshire, 1961).

**Description.** Alar expanse of male 45-47 mm, of female 50 mm. Fw black with a white pattern. External part of fw with an X-shaped white pattern. Three white, gradually reduced belts running from costal edge of fw, the belt running closer to wing base not reaching the hind edge of fw; basal band reaching the base of wing and containing black points. Hw red with three black submarginal spots. On underside, basal part of fw pink and partly replacing a black background in the middle of fw. Underside with two black spots at a yellowish white costal edge of hw. Abdomen red with black transverse short lines on dorsal and lateral sides of each segment. Legs yellowish.

**Variability.** Individual variability insignificant. In showing a median white belt, the *f. ilithya* Böttcher, 1905, described from Naryn, Central Tian-Shan, becomes similar to the ssp. *thibetica* Felder, 1874, from the northwestern Himalaya;

*f. pulchrior* Seitz, 1910 with extended white spots;

*f. aurantiaca* Seitz, 1910 with yellow hw, and some other varieties;

ssp. *intercalaris* is distributed in Dzungskiy Alatau Mts, in the Tian-Shan (including Central Tian-Shan) and the West Altai;

ssp. *boettcheri* O. Bang-Haas, 1927, described from Terskey Alatau, yet with inappreciable differences from the typical form, the moth being a little larger, with an extended white pattern;

ssp. *alpherakyi* Staudinger, 1886 inhabits the W. Pamirs and Pamirs-Alai and differs from the typical form by the unusually small size (30 mm), yet the differences in pattern are insignificant. The form from the Shugnanskiy Mt. Range (Sangou-Dara River), volant at 3300-3500 m a.s.l., probably belongs to this subspecies. It is small (alar expanse 30-32 mm), the white stria in the apical part of the fw is reduced.

Beyond the territories considered, several other subspecies/forms have been known. Among them are the following:

ssp. *thibetica* Felder, 1874, a highly original form noticeably different from the others; Tibet. Ladak;

ssp. *suttadra* Moore, 1879b, Himalaya;

*f. (?) elisabethana* Bender & Naumann, 1980;

*f. (?) cajula* Staudinger, 1886;

f.(ssp.) *aurantiaca* Seitz, 1910.

The latter form deserves special mention. It differs by the yellow hws and illustrates the common trend in replacing the red colour by yellow. Similar forms can be found all over the geographical range of this species.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Dzungarskiy Alatau Mts, Zailiiskii Alatau (Talgar River, Lake Issyk); West and Central Tian-Shan (Maidantal River, Naryn) and Pamirs-Alai (Dugoba River), Hissarskiy Mt. Range, Turkestanskiy Mt. Range (Kum-Bel Pass, Zaaminskiy Nature Reserve), West Pamirs (Shugnanskiy, Shakhdariinskiy, Darvazskiy Mt. ranges). Beyond the former Soviet Union. The mountains of Afghanistan and Northwest Pakistan; the Himalaya (Kashmir).

**Biology.** Flight in July-August in the afternoon. Differs by fast zigzag flight. Occurring on open mountain slopes at 2000 to 3000 m a.s.l. Caterpillars reddish brown with fascicles of hairs on black warts, found on raspberry (*Rubus*).

**Similar species.** In our fauna, no particularly similar species seem to exist.
Arctia ladakensis (O. Bang-Haas, 1927)

Oroncus ladakensis O. Bang-Haas, 1927: 116, TL: Ladak; Sham, Chalsi.

ladakensis – from Ladak (Lat.)

Draudt, 1931: 79, pl. 6 row k, Micrarctia ladakensis
Dubatolov, 1996c: 242, Arctia ladakensis
Abdrashitova et al., 1996: 242, Arctia ladakensis

Description. Alar expanse of male 33 mm, of female 34 mm. Fw deep black with four yellowish white transverse striae. First basal belt reaching the inner edge; second belt running from the centre of costal edge only up to the middle of wing; third transverse belt running from costal edge to anal angle; fourth belt, close to apex, only weakly traced. In female, these belts considerably thinner because of an expanded black background. Hw of male reddish yellow, in female red, with two prolate black spots at edge of wing, just like in O. tancrei. Hw of female with a black median spot. A clear, transverse stria located in front part of hw between base and median spot. Head, thorax and abdomen black, latter with a long red stria. Antennae of female simple, not dentate. Holotype in ZMKU.

Variability. No data.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Perhaps Kokshaal-Tau Mt. Range.

Beyond the former Soviet Union. The moth is known from Ladak and the Aksu River Valley (probably Kokshaal-Tau Mt. Range), China: Xinjiang (Dubatolov, 1996b).

Biology. Flight at very high elevations (h ~ 5000 m a.s.l.) in June-July.

Similar species. In our fauna, no particularly close species seem to exist.

Note. O. Bang-Haas (1927) wrote: “Owing to the prolate shape of the wing and a resemblance of the spots on the hws, I would like to provisionally allocate this interesting, small species in the genus Oroncus. As the antenna of the male is absent, a more precise diagnosis is impossible at the present”.

Draudt (1931) placed this species in Micrarctia, whereas Dubatolov (1996b) in Arctia.

38. Arctia caja (Linnaeus, 1758)

(Pl. 7, Figs 4-9; Pl. 8, Figs 1-8; Pl. 9, Figs 1-4; Figs 36-39; genitalia in Fig. 5)


[= tusitanica Spuler, 1910; rebeli Vnukovsky, 1929]

caja – flame, burning (Gr.)

[Garden Tiger, Great Tiger, Woolly Bear (larva) – (Engl.)]
[Brauner Bär, Gemeiner Bär, Nesselspinner Bärvogel – (Germ.)]
[Ecaillé Martre, Ecaillé Hérissone – (Fr.)]

Staudinger. 1892: 278, Arctia caja
Spuler, 1910: 148, pl. 74, fig.12, Arctia caja
Seitz,1913: 98, pl. 19 row b, Arctia caja
Dubatolov, 1996b: 50, Arctia caja
Fang, 2000: 334, Arctia caja

Subspecies:
A. c. tshimgana Sheljuzhko, 1935b: 31
A. c. pamiroalaica Stshetkin, 1982: 39
A. c. confiuens Rebel, 1910: 430
A. c. kamtschadalis Draudt, 1933: 87, f. 7f
A. c. sajana O. Bang-Haas, 1927: 72, pl. 9, f. 6, ♂
A. c. *phaeosoma* (Butler, 1877): 395 [= *Euprepia auripennis* Butler, 1881; *immaculata* Matsumura, 1927; *tschiliensis* Draudt, 1931]  
A. c. *wiskotti* Staudinger, 1879: 333  
A. c. *ossetica* Dubatolov, 1996b: 37, 71  

**Description.** One of the largest tiger moths in our fauna. Alar expanse from 50 up to 75 mm. Fw brown with a white pattern in the form of intersecting bands and spots. Hw red-orange with dark blue, shining spots encircled black. Head and thorax brown, sometimes with a reddish collar, abdomen orange with black, transverse, short lines on upper side of each segment. White pattern of female more strongly developed.

**Variability.** Distinguished by very high-degree geographical and individual variability. A number of forms (aberrations) and geographical races (subspecies) have been described from different regions. In many cases, the coloration of the hw can vary from red to yellow. In other cases, the white pattern on the fws or the dark spots on the hws appear reduced or missing. Because of the strong variability, the species is an interesting object of genetic research.

The following forms can be denoted among others:

- **ab. phantasma** Niepelt, 1905 –-fw uniform cream white, hw red but black spots replaced by yellow; described from England (Fig. 38: 2);
- **ab. bolga** Theiri-Miegen, 1910 –-fw uniform brown, hw uniform black or brown; forms transitional to the usual specimens also existing;
- **ab. immaculata** Matsumura, 1927 – described from Korea, but occurring in other places as well, devoid of a black spot in the central cell of the hw;
- **ab. rubrodorsalis** Schultz, 1908 – black spots on abdomen absent.

Among the stable geographical forms, the following can be mentioned:

- **ssp. caja** – the typical form widespread over the European part of Russia, the Crimea, the northern Caucasus, northern Kazakhstan and southwestern Siberia (Fig. 38: 1);
- **ssp. tshimgana** (Pl. 7, Figs 6, 7) – a form with an extensive white pattern widespread in the Tian-Shan and in the south of Fergana Valley;
- **ssp. pamiroalaica** (Pl. 7, Figs 8, 9) – differing by yellow hws and a yellow abdomen; Peter-1 Mt. Range (TL: Darai-Nazarak), Hissarskiy, Karateginskiy, Khozratishokh Mt. ranges, western part of Shugnanskiy Mt. Range (Khorog);
- **ssp. confluentes** – distinguishable by a weakened white pattern of-fw; hw red with extensive, black, partly merged maculae; distribution in the south of Karelia, Lake Ladoga, probably in other boreal areas;
- **ssp. kamtschadalis** (Pl. 8, Fig. 6) – very narrow white stripes on-fw; hw red; distributed in Kamchatka and Sakhalin (possibly this form is phenotypical, associated with a cold climate); specimens with a similar coloration sometimes occur in Siberia (Zeya region, Altai Mts), in the Urals and near Moscow; superficially, this form is close to the following;
- **ssp. sajana** (Pl. 8, Fig. 1) – “Sajan mont: Tunkinsk Weißgebirge”, 2000 m a.s.l.; the moth is darkened, the hws are distinguished by small rounded spots.

**Fig. 38.** Variability of *Arctia caja* (L.): normal form (1) and ab. *phantasma* Niep. (2).
ssp. *phaeosoma* (Pl. 8, Figs 2-5) – this large moth differing by strong variability of coloration and pattern intensity; coloration of hw of female varying from bright red to pale orange and yellow; occurring in Amurland, the Primorye as well as in the adjacent parts of China and Korea;

ssp. *wiskotti* (Pl. 9, Figs 1-4) – this rather large subspecies (male 55-60 mm, female about 80 mm in alar expanse) with an extensive white pattern and with pale yellow hw's occurs in Armenia;

ssp. *ossetica* Dubatolov, 1996b – “Ossetia, Buron, 1250 m”. “The wing expanse is 60-64 mm in males, 75 mm in females. This subspecies is transitional between the European *A. caja caja* and the Transcaucasian *A. caja wiskotti*. The colour of the fw and the shape of spots are the same as in the above subspecies, but the coloration of the hw is peculiar, being bright yellowish orange in the new subspecies, bright red in *A caja caja*, and pale yellow in *A. caja wiskotti*”;

ssp. *orientalis* – a variety with but minor colour differences from the nominate form, Kashmir.

In addition, a number of subspecies have been described from North America:

*A. c. americana* (Harris, 1841);

*A. c. utahensis* (Edwards, 1886);

*A. c. transmontana* (Neumoegen & Dyar, 1893);

*A. c. parva* Rothschild, 1910, and some others.

**Distribution.** Pattern Holarctic.

Within the former Soviet Union. Baltic countries; Belarus; Ukraine, Crimea; Moldova; European part of Russia up to Arkhangelsk, Syktyvkar and Ukhta, Komi Republic in the north; Caucasia; Transcaucasia; South Kazakhstan (Zailiiskiy Alatau); mountains of the West Tian-Shan; South Siberia (up to Khanty-Mansiisk, Altai, Tomsk Region and Angara River in the north); central Yakutia and Magadan Region (Upper Kolyma region); Kamchatka; Amur River Basin (Zeya, Pashkovo, Raddevka); Primorye; Sakhalin; Southern Kuril Islands (from Iturup to Kunashir).

Beyond the former Soviet Union. Western Europe (except for the Polar regions, the southern part of Iberian Peninsula, and Greece); Asia Minor; Iran; mountains of Afghanistan and Pakistan; Mongolia; China (Xinjiang, Henan, Hebei; Dunbei); Korea; Japan (Hokkaido, Honshu); North America (Canada; USA, including Alaska).

**Biology.** Flight from the end of June till August. Everywhere usual. Moths flying after sunset, often arrive on light.

According to some observations, when the moth feels itself as being in danger, fetid transparent drops nettle in odour are excreted from the fore part of the thorax. Special experiments have shown this excretion to be repellent to many predators which thus avoid attacking *A. caja*. This behaviour also corresponds nicely with the expressed aposematic coloration of the moths.
In the mountains, the species reaches up to 2500 m a.s.l. (West Tian-Shan, Pamirs-Alai, Altai). Last instar caterpillars, in England termed as “shaggy bears”, are coated with long thick hairs, the thorax is brown-black, the lateral sides red (Fig. 39). A penultimate instar larva has silvery hairs. Larvae feed on various herbaceous as well as some shrubby and woody plants: Allium schoenoprasum, Betula spp., Alnus incana, Salix spp., Populus tremula, Rheum rhabanticum, Sedum telephium, Ribes spp., Fragaria ananassa, Rubus idaeus, Filipendula ulmaria, Spiraea salicifolia, Malus domestica, Sorbus aucuparia, Crataegus coccinea, Prunus padus, P. domestica, P. nana, Geum rivale, Trifolium spp., Vaccinium myrtillus, V. uliginosum, Calystegia sepium, Stachys sylvatica, Lamium album, Plantago spp., Achillea millefolium, Taraxacum spp. Caterpillar hibernating.

Similar species. A. caja is easily identifiable in spite of the strong variability. A. olschowangi Dubatolov differs in the smaller size, the pink tint of the fw white pattern, the small oval eyes and certain details of genitalic conformation.

39. *Arctia flavia* (Fuessly, 1779)

(Pl. 9, Figs 5-8; Fig. 40; genitalia in Pl. 26, Fig. 2)

*Bombyx flavia* Fuessly, 1779: 70, pl. 1, fig. 11, TL: High Alps (Switzerland and Tyrol) “Hochalpen der Schweiz und Tirol”.

[flavia – yellowish (Lat.)]
[Gelber Bär – (Germ.)]
[Ecaile Jaune – (Fr.)]

Erschoff, 1874: 32, pl. 2, fig. 28, *Arctia flavia*  
Christoph, 1887b: 55, pl. 3, fig. 2, *Arctia flavia*  
Graeser, 1892: 212, *Arctia flavia campestris*  
Heyne, 1899: 98, *Arctia flavia uralensis*  
Hampson, 1901: 272, *Arctia flavia*  
Oberthür, 1906: 40, *Arctia flavia*

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*Fig. 40. Arctia flavia* (Fuessly), ♂ Russia, Altai Mts, 10 km E of Aktash, 50°19’ N, 87°45’ E, 2000 m a.s.l., 13.VII.2000 (photo by O. G. Gorbunov).
Seitz, 1910: 99, pl. 18, row b, *Arctia flavia*
Bang-Haas, O., 1927: 74, pl. 9, fig. 11, *Arctia flavia baicalensis*
Bang-Haas, O., 1927: 75, pl. 9, fig. 12, *Arctia flavia lederi*
Bang-Haas, O., 1927: 75, pl. 9, fig. 13, *Arctia flavia jeholensis*
Draudt, 1931: 87, *Arctia flavia*
Fang, 1982: 212, fig. 1573, *Phragmatobia flavia*
Fang, 2000: 335, pl. 15, fig. 1, *Arctia flavia*

Subspecies:
- *A. f. uralensis* Heyne, 1899
- *A. f. sibirica* Heyne, 1899
- *A. f. baicalensis* O. Bang-Haas, 1927
- *A. f. lederi* O. Bang-Haas, 1927
- *A. f. jeholensis* O. Bang-Haas, 1927
- *A. f. campestris* Graeser, 1892.

**Description.** Alar expanse about 55 mm. Fw black with white or yellowish striae. One of the transverse belts located closer to base of wing connected with the base by a pale stria. External part of fw with a pale X-shaped pattern. Apex of fw with a light bracket. Head and thorax black. Abdomen on underside and caudally black, lateral sides pink, upper side with dark spots. Hw pale yellow with a black bracket on transverse vein and with two maculae closer to wing edge. Antennae of male weakly pinnate. Female a little larger with a more strongly developed black pattern on hw. Fringe white.

**Variability.** Pale pattern of fw sometimes weakened. In some cases, fw completely black (Pl. 9, Fig. 8).

The following forms/aberrations are noteworthy:
- ab. *albimaculata* Lorez, 1904 – centre of fw with a large white spot;
- ab. *nox* Romberg, 1913 – fw and hw black;
- ab. *immaculata* Lorez, 1904 – spots on hw weakened;
- ab. *continua* Schultz, 1905 – a black belt along edge of hw;
- ab. *signata* Spuler, 1910 – 4-5 small, additional, boundary spots on hw.

Based on the literature, the following taxa seem stable geographically, but their actual status remains unclear:
- ssp. *uralensis* – described from the foothills of Middle and South Urals, this moth shows very slender white striae on the fw while the hw differs by a saturated yellow colour;
- ssp. *sibirica* – differing by narrow white belts on fw and almost merged spots of submarginal belt on hw, “Tarbagatai” (Tarbagatay Mt. Range, Kazakhstan);
- ssp. *baicalensis* (Pl. 9, Fig. S) – with a poor residual white pattern in the form of thin interrupted striae; fw almost purely black; black pattern of hw extensive; Irkutsk, Transbaikalia;
- ssp. *lederi* (Pl. 9, Figs 5-6) – small slender moths with a dark but not black coloration of fw and an extensive white pattern; hw pale yellow with small black maculae, often so at anal edge only; Altai, northern Mongolia, Tuva, Sayan;
- ssp. *jeholensis* – differing by large size (typical specimen: female 55 mm), fw with a broadened white pattern, hw pattern, on the contrary, attenuated; median spot point-shaped, submarginal spots narrow; abdomen yellow instead of red; Cisamuria (“Khingan mount. Or.: Prov Tehili, Lin-si-hien, Chi-fong-shien”);
- ssp. *campestris* – alar expanse 53-58 mm, median spot on fw reaching the inner edge; hw pale brown-yellow, often absolutely devoid of black spots, abdomen brown-yellow; Blagoveshehensk, Amurskaya Region, Russian Far East.

**Distribution.** Pattern East Palearctic.

Within the former Soviet Union. North Ukraine, including Carpathians; European Russia east of Tver, up to Syktyvkar, Komi Republic (Sedykh, 1974), in the north, Saratov Region and Orenburg in the south; North Kazakhstan; West and South Siberia (up to 60°N: Kurgan, Omsk, Tomsk, Khanty-Mansiisk and Podkamennaya Tunguska River); considerable parts of Yakutia (up to the Upper Kolyma region in the north); Magadan Region (Upper Kolyma); Amur Basin (Zeya, Pashkovo, Khabarovsk); Primorye.

Beyond the former Soviet Union. Mountains of Western Europe (Alps, Balkans); Mongolia; China [Xinjiang, Nei Mongolia, Lisonin (Fang, 2000), Manchuria, Hebei]. O. Bang-Haas (1927) recorded this species in North Germany, yet in a later work (Koch, 1984) there is no confirmation of this report for the same region.
Biology. Flight from early July up to the end of August. According to some published observations, the moth, when in danger, can exude transparent oily droplets which smell like nettles. The moth ejects the fluid from the front part of the thorax in two jets to a distance of 20 cm.

In the Alps, flying at 1600 m a.s.l. Over our territories, flight is also observed in lowlands but in the mountains (Altai: environs Aktash, Ukok Table-land) reaching 2800 m a.s.l. Often occurring in steppe or forested steppe landscapes. Females lay pale yellow eggs on herbaceous plants, but sometimes on bushes as well. Egg development about two weeks. Caterpillars light gray, coated with fascicles of short gray hair, omnivorous, sometimes (e.g., West Siberia) harmful to agricultural plants. In Yakutia and Transbaikalia, hibernating twice. In spring, larvae start eating in the end of April, pupating in June. Pupa lasting 2-3 weeks.

Similar species. There seem to be no similar species in our countries.

40. *Arctia rueckbeili* (Püngeler, 1901)

(Pl. 10, Fig. 1)

*Hyphoraia rueckbeili* Püngeler, 1901: 190, pl. 3, fig. 11a, TL: “Aksu in Central Asia”.

[Probably, the inferior flow of Sary Dzhas River (Kokshaal Tau Mts, in China)].

[rueckbeili – in honour of German entomologist Rückbeil]

Seitz, 1910: 100, *Arctia rueckbeili*

Draudt, 1931: 87, Pl. 7 row f, *Arctia rueckbeili*

Dubatolov, 1987b: 87, *Arctia rueckbeili*

Description. Alar expanse 55-60 mm. Fw pale brown with separate yellowish spots. Hw yellow with pale brown spots all over; a brown bracket on discal vein. Coloration of underside same. Head dark brown. Thorax clothed with hairs of same colour as wing. Collar pink with white. Abdomen on underside and from above dark, upper side with transverse dark bands on each segment, on lateral sides pinkish or yellowish.

Variability. Rather often the coloration of the fw is ashy brown, just as illustrated in Draudt (1931).

Distribution. Pattern Central Asian.

Within the former Soviet Union. Turkestanskiy, Alaiskiy and Zaalayskiy Mt. ranges, Kaingdy-Katta Gorge in Central Tian-Shan.

Beyond the former Soviet Union. According to Seitz (1910), the species also occurs in “desert south of Aksu (Central Asia)” (China).

Biology. Flight in July in the mountains at 2500-3500 m a.s.l. In the Alaiskiy and Turkestanskiy Mt. ranges, rather common in juniper woodlands (Fig. 41).

Similar species. In our fauna, similar species seem to be absent.

41. *Arctia olschwangi* Dubatolov, 1990

(Fig. 42)

*Arctia olschwangi* Dubatolov, 1990c: 89, TL: southern Yamal.

[olschwangi – in honour of Russian entomologist V. N. Olschwang]

Description. Alar expanse about 42 mm. Fw pale brown with pink-white belts. Superficially very similar to *A. caja*, but differing in details of pattern. Spots on hw dull black, subbasal spots narrow. Pattern of fw with strong pink tint. Eyes small, oval, hairless, twice as long as wide. Antennae of male two-combed, of female bipectinate.

Variability. Only several specimens are known.


Within the former Soviet Union. The Polar Urals, southern Yamal, lower flow of Lena River (extreme north).
Beyond the former Soviet Union. Unknown.

**Biology.** Flight from mid-July to the beginning of August in the tundra.

**Similar species.** *A. caja*, differs by a larger size, by the eyes orbicular in shape, and by certain details of genitalie conformation.
23. Genus *Epicallia* Hübner, 1820


Fw with one additional cell. Antennae of male bipectinate. Body stout. Middle calariae of hind tibiae shorter than diameter of tibiae.

Male genitalia. Sacculus with a finger. Peniculus short, no more than 4-5 times longer than broad, oblate toward apex.

42. *Epicallia villica* (Linnaeus, 1758)

*(Pl. 10, Figs 2-5; Figs. 43, 44)*


[= *vidua* Poda, 1761; *konewkaii* Freyer, 1831; *domiduca* Meigen, 1832; *secular* Zeller, 1847; *nigrella* Fettig, 1889; *arabum* Oberthür, 1910; *britannica* Oberthür, 1911; *nicaeensis* Oberthür, 1911; *corsica* Oberthür, 1911; *syriaca* Oberthür, 1911; *wambachi* von der Goltz, 1932; *floresi* Agenjo, 1942]

[villica – villager (Lat.)]
[Cream-spot Tiger – (Germ.)]
[Schwarzer Bär – (Germ.)]
[Ecaille fermière – (Fr.)]

Romanov, 1884: 87, pl. 4, fig. 9, *Arctia villica confluens*
Dubatolov, 1996b: 52, *Epicallia villica*

Subspecies:
*E. v. angelica* (Boisduval, 1829): 31
*E. v. fulminans* (Staudinger, 1871): 59
*E. v. confluens* (Romanov, 1884)
*E. v. marchandi* (de Freina, 1983): 73.

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**Fig. 43.** *Epicallia villica* (L.), ♂ on tree trunk. Russia, Moscow Region, October District, Derevlevo, 10.VII.1967 (photo by A. Grazhdankin).

**Fig. 44.** *Epicallia villica* (L.), ♂. Kazakhstan, Aktyubinsk Region, 26 km W of Novoalekseevka, 50°10’N, 55°18’E, 225 m, 6.VI.1998 (photo by O. G. Gorbunov).
**Description.** Alar expanse of male 50-55 mm, female larger. Fw black with eight pale rounded spots of various size (largest basal spot often drop-shaped; lesser spot at external edge). Hw ochre yellow with black spots and a transverse band near external edge. Thorax black with two light spots; abdomen reddish with a series of black maculae. Probosces abortive.

**Variability.** Individual variability notably profound, displayed in reduction or fusion of light maculae on fw, in variation both in number and size of black maculae on hw.

The following subspecies are known:

- **ssp. confluens** (Pl. 10, Fig. 2) – a taxon with merged largest light spots on fw. Romanov (1884) provided a colour illustration and described this moth as a subspecies based on material from Lenkoran, Astrabad and other parts of Iran;
- Another form with an expanded light pattern occurs in Nakhichevan (Pl. 10, Fig. 4). Apparently, this moth can be considered as transitional to the typical form.

A number of subspecies are known from beyond the territories concerned, e.g. **ssp. anglica** and **ssp. fulminans**, from Syria, with red hws similar to those of **Parasemia plantaginis caucasica** Ménétriès from the Caucasus, and **ssp. marchandi** (de Freina, 1983).

**Distribution.** Pattern West Palaearctic.

Within the former Soviet Union. South of Baltic countries (Lithuania and Latvia); Belarus; Ukraine, Crimea; Moldova; European Russia up to St.-Petersburg and Vyatka in the north; Caucasus; Transcaucasia (Nakhichevan, Armenia, Lenkoran); West Siberia (Kurgan, Shadrinsk).

Beyond the former Soviet Union. Central and Southern Europe, southern England; northwestern Africa; Asia Minor; Near East; Turkey, northwestern and northern Iran up to Shahkuh Mts in the east.

**Biology.** Inhabiting lowlands and hilllands in the south of the Palaearctic and in northern Europe, except for the polar belt. Flight at night, flying to light, in the daytime hiding in grass or bushes. Sometimes moths can be seen on walls of houses and fences. Caterpillar black with gray-brown fascicles of hairs. Head and legs reddish brown.

Larvae feeding on various herbaceous plants: **Plantago, Lamium, Achillea, Taraxacum, Urtica, Centaurea, Fragaria** etc. Hibernating as caterpillars, pupating in spring. Moths flying in the late spring and in the beginning of summer, at the Black Sea coast of the Caucasus from the end of April, near Moscow from early June. Population densities of moths subject to considerable variation from one year to another. In Central Europe, the moths are distributed sporadically, in some regions, e.g. northern Germany; rare.

In the mountains (Transcaucasia: Nakhichevan, Armenia), moths occur at 1500-2000 m a.s.l.

**Similar species.** There seem to be no particularly similar species in our fauna.

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24. Genus **Eucharia** Hübner, 1820


= **Ammobiota** Wallengren, 1885, TS: *Phalaena hebe* Linnaeus, 1767.

Moth of medium size with a stout body and brightly coloured wings. Fw with white and black transverse striae. In external part of fw, pattern H- or R-like. Antennae of male and female pectinate; in female, crests short.

Key to species of **Eucharia**:
1. Thorax black, collar wide and brightly red, yellow or white. ........................................................................................................ 2
   – Collar very thin or absent. ................................................................................................................................................. **E. festiva**
2. Collar without black points. ................................................................................................................................................... **E. interrogationis**
   – Collar with two black points. ............................................................................................................................................. **E. culoti**

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43. **Eucharia festiva** (Hüfngel, 1766)

(Pl. 10, Figs 7-8; Pl. 11, Figs 1-9; Figs. 45-46; genitalia in Fig. 47 and Pl. 26, Fig. 3) 
*Bombyx festiva* Hüfngel, 1766: 416, TL: Germany, Berlin.

[= *hebe* Linnaeus, 1767; *monacha* Geoffroy, 1785]
Staudinger, 1895: 395, *Arctia hebe sartha*
Spuler, 1910: 137, pl. 73, fig. 10, *Arctia hebe*
Seitz, 1910: 100, pl. 18, row d, *Arctia hebe*
Wagner, 1913: 4, *Arctia hebe iliensis*
Bang-Haas, O., 1927: 75, pl. 9 figs 14-15, *Arctia (Eucharia) festiva nivea*
Bang-Haas, O., 1927: 76, pl. 9 fig. 20, *Arctia (Eucharia) festiva philippsi*
Bang-Haas, O., 1927: 76, pl. 9 figs 21-22, *Arctia (Eucharia) festiva interposita*
Dubatolov, 1996b: 52, *Eucharia festiva*
de Freina, 1997: 58, figs 22-25, *Arctia festiva arafati*
Fang, 2000: 332, pl. 6, fig. 1, *Eucharia festiva*

**Subspecies:**

*E. f. sartha* (Staudinger, 1895)
*E. f. iliensis* (Wagner, 1913)
*E. f. interposita* (O. Bang-Haas, 1927)
*E. f. philippsi* (O. Bang-Haas, 1927).

**Description.** Male alar expanse 50 mm, female 46 mm. Background coloration of *fw* black, pattern consisting of white transverse bands. Two bands closest to base of wing, reaching the hind edge, the third narrower and short. External edge of wing black. White pattern on external part of *fw* H-shaped. Hw purple red with two black submarginal

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*Fig. 45. Eucharia festiva* (Hfng.), ♂. Kazakhstan, Aktyubinsk Region, 10 km SSW of Novomikhailovka, 50°26′N, 56°04′E, 320 m, 27.V.1998 (photo by O. G. Gorbunov).
*Fig. 46. Eucharia festiva* (Hfng.), ♀. Ukraine, Crimea, Belogorsk, 2.V.1996 (photo by O. G. Gorbunov).
prolate spots and a narrower black stria closer to base of wing. A black spot often present in place of transverse vein. Head and thorax black. Collar red, narrow. Abdomen red on lateral and on upper sides, but with black striae on upper side, tip of abdomen black. Antennae twice pectinate.

Female a little smaller with brighter red hws. Pattern on wing like in male. Last segments of abdomen black. Antennae weakly pectinate.

Variability. One of the most intriguing and enigmatic tiger moths in our fauna. Individual variability is pronounced, apparent in a shortened or reduced white pattern, in brachypterous females, in size variation, in the existence of relatives of unknown rank.

A number of subspecies are known, the following from our territory.

Ssp. (?), from the Rostov-on-Don Region (Efremo-Stepanovka, 200 km north of Rostov-on-Don), distinguishable by the very thin black bands on the male fw and, like in the female, by the bright red colour of the hw. Female with black fw with two transverse white bands. The third white band is absent, and the central field on the fw is black (11 ♂ and 4 ♀). These moths are probably close to European forms.

Ssp. philippsi O. Bang-Haas. This subspecies was described from “Gouv. Syr Darja: reg. Perowsk, Baiga-Kum”.

A highly interesting subspecies. Alar expanse 40 mm. Background coloration of male fw pale pink. Five wide black belts almost fused, first four divided only by weak white lines. Both submarginal black spots divided by a thin white line, this occurring but extremely seldom in festiva. Hw pale pink with short transverse belts at costal edge, with a small basal spot and an interrupted submarginal belt. Collar thin, red. Thorax and abdomen black.

Ssp. sartha Staudinger: Syr-Darya, Auli-Ata (Baigakum), Kzyl-Orda. The holotype (male) from the Tarbagatay Mts was illustrated by O. Bang-Haas (1927). Alar expanse of male 47 mm.

Fw with three black belts, these being much wider than in the other subspecies. Though distance between these belts small, none of them in touch with one another.

Female smaller (alar expanse 43-45 mm), with short-cut wings and a bordered pale collar. The female figured in Seitz (1910) shows a dominating white colour of the fw and rather narrow black striae. Hw red with a basal black band reaching the hind edge of wing. Black spots on hw with a narrow light bordering. This subspecies forms an interesting transition to E. interrogationis Ménétriës, 1863.

Ssp. interposita O. Bang-Haas: “Alai mont.”.

This subspecies differs first of all by the small size (alar expanse 35 mm). Male: fw with a very wide black field (central white band absent), hw pale pink with a narrow boundary belt. Collar, thorax and abdomen completely black.

Female not capable of flight, brachypterous, wings considerably shorter as compared to body size. Fw completely black, hw with a black external belt and a transverse band. Collar red and thin, thorax and a part of abdomen black, fore half of abdomen red. Though no material from the Alai Mts has been available to us, a female corresponding to the description has been found on Mt. Chimgan in the western part of Chatkalskiy Mt. Range (Pl. 11, Fig. 2). Alai, Margelan, Chatkal.

Ssp. (?). A larger form is known from Zuvand, Talysh Mts, southern Azerbaijan: alar expanse of female up to 48 mm. A considerable proportion of females show black fws and black belts instead of spots on hws. Black females sometimes display white spots on the fws. Coloration of male fws black with usual narrow white strips (Pl. 11, Figs 4, 9).

Ssp. (?). A similarly larger form is observed in the environs of Chimkent, Kazakhstan (Kara-Tau Mts): alar expanse 45 mm. Fw black, in many cases with white maculae near external border closer to base (Pl. 11, Fig. 3). This form is

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**Fig. 47.** Male genitalia of *Eucharis festiva* (Hfng.), valve and uncus.
similar to some specimens from Zuvand. Superficially it also resembles the ssp. *interposita*, but the size is noticeably larger. Hw brightly red with large black maculae, but not belts as in the ssp. *interposita*. It is possible that this variety actually belongs to the next subspecies.

Further to the east, the following form is known to occur:

Ssp. *iliensis* Wagner. This subspecies was described from “Ili-Gebiet, Alexandergebirge”, i.e. Semirechye (Ili River) and Kirghizskiy Mt. Range. Alar expanse 40-46 mm. This form has narrow white bands on the fw and a not always missing third band. Hw strongly spotty. When defining the given subspecies, O. Bang-Haas (1927) mentioned the existence of black females in the Kirghizskiy Mt. Range (Pl. 11, Figs 6-7).

From Asia Minor, the ssp. *nivea* O. Bang-Haas, 1927 and the ssp. *arafati* de Freina, 1997 (Anti-Liban Mt. Range) are known. The former variety differs from the European specimens by snow-white tint of the fw and by an extensive light pattern.

Thus, females with black hws occur from Lenkoran, Caucasus to Chimkent, W. Chatkal (Chimgan) and Alai, Central Asia. Over the remaining parts of the distribution area, females tend to show the usual fw pattern.

**Distribution.** Pattern Mediterranean and Euro-Siberian.

Within the former Soviet Union. Belarus; Ukraine; Moldova; European Russia (south of Oka River, Kazan, Middle Urals), West Siberia (Kurgan, Omsk, Novosibirsk, western Altai, Tuva); South Transbaikalia (data from the early 1900’s); Caucasus; Transcaucasia (Azerbaijan, Armenia, Georgia); Kazakhstan (Ili River steppes, Zailisky Alatau Mts, foothills of the Kirghizskiy and Talasskiy Mt. ranges); Uzbekistan (Tashkent, Ugam, Chatkal, Chimgan, Syr-Darya, Fergana, Shakhkimardon).

Beyond the former Soviet Union. Central and Southern Europe (except for the southern part of Spain and western France), Sicily; Iraq, Asia Minor, Anti-Liban Mt. Range; Mongolia; China (Xinjiang). There are some data suggesting that in Europe the distribution area of this species is shrinking.

**Biology.** Moths appear in the middle to end of spring, usually in May. Males flying to light. As females are too heavily loaded with eggs, they do not fly and can often be seen creeping on the ground in the daytime.

Eggs hemispherical, in the beginning pale yellow but silvery gray later. Usually about 200-300 eggs per batch. Caterpillars from the Caucasus rather light smoky gray, coated with bunches of hairs of the same colour on dorsal side but reddish on lateral sides. According to Lampert (1913), in Germany the caterpillar is black with long gray-black hairs on the dorsal side but rusty red hairs on both lateral sides, the warts are dark gray, the head is black. Last instar caterpillar up to 60 mm long. Larvae feeding on *Achillea*, *Thymus*, *Euphorbia*, *Plantago*, *Taraxacum*, *Cynoglossum*, *Artemisia*, *Rumex*, *Cirsium*, *Alium*, *Chenopodium*. Caterpillar hibernating. Pupation in April in a loose gray cocoon with admixture of hairs. Pupa black-brown.

Inhabitant of various places like wood, steppe or forested steppe, but more common in rather dry places, including dry mountain slopes, in Armenia up to 2000 m a.s.l. According to some observations, in Western Europe this species becomes increasingly rare. In the Caucasus and Kazakhstan, this species is one of the most usual spring moths. Thus, *E. festiva* probably belongs to a group of basically Asian species which, in the western part of the geographical range, i.e. at the distribution periphery, appear increasingly sporadic.

**Similar species.** *E. interrogationis*, differs by the wide white belts on the fw and the wide bright red collar.

### 44. *Eucharia interrogationis* (Ménétriès, 1863)

(Pl. 10, Fig. 6)

*Chelonia hebe interrogationis* Ménétriès, 1863: 147, pl. 15, fig. 1, TL: Kolyvan in Altai Region.

[= *collaris* Grum-Grimshimailo, 1899]

[interrogationis – interrogative (Lat.)]

Grum-Grimshimailo, 1899: 462. *Arctia hebe collaris*

Seitz, 1910: 100, pl. 18, row d, *Arctica hebe interrogationis*

Bang-Haas, O., 1927: 76, *Arctica festiva interrogationis*

Bang-Haas, O., 1927: 76, pl. 9, fig. 28, *Arctica festiva interrogationis ab. collaris* [sic!]

Dubatolov, 1996b: 52, *Eucharia festiva collaris*

de Freina, 1997: 58, *Arctica interrogationis*
**Description.** Male: alar expanse about 50 mm. Basic colour of fw white. Several black transverse bands intersecting fw. Base of fw black with further three narrow, black, transverse bands. Fourth band broken into two in the middle. Apex and part of external edge of fw black. Fringe in places adjoining to a black stria also black, remaining parts white. Hw pink, with black spots elongated transversely, edged yellow. Hw with a thin, black, transverse line in fore half of wing. Head, antennae and thorax black, collar widely red. Abdomen red, except for black last segments.

Female with narrow and short fws. Background colour of fw white. Pattern consisting of four thin, transverse, black stripes. Base of fw white. Hw red, brighter than in male. Middle part of hw with a black stripe. Hw with two submarginal elongated spots and one spot in the middle of costal edge. Collar very wide, yellow or white, thorax black with two large white spots on prothorax. Abdomen red with black transverse rings, end of abdomen (the last two segments) black. Antennae dentate. Female not flying.

**Variability.** Black transverse bands of fw sometimes very narrow, striolate-like.

Ssp. **collaris** (Grum-Grshimaïlo) – “In montibus In-shan in itinera Peking et Dolon-noor”. The specimen from Transbaikalia/Dahuria illustrated by O. Bang-Haas (1927) (pl. 9, fig. 28) shows bright red hws like in the female, and a red (except for the last segments) abdomen. According to O. Bang-Haas, this species occurs also in SE. Siberia and probably at Shanghai, China. However, the moths taken from Mongolia and at Menza River, Transbaikalia, Russia appear to look very different from O. Bang-Haas’ material.

**Distribution.** Pattern Mongolian-Chinese.

Within the former Soviet Union. Southeastern Siberia (River Menza), Altai (?) Beyond the former Soviet Union. Mongolia (Central Aimak, East Aimak, Urtyn) and adjacent parts of China.

**Biology.** Flight from the end of May to mid-June. Female brachypterous, with short wings, not capable of flight.

**Similar species.** *E. festiva*, differs by a developed black pattern. The red collar is either very weakly expressed or absent, the fringe is completely black. *E. culoti*, has both head and collar light yellow, the latter with two black points.

**Note.** The fw pattern of this species tends to intensify its white colour while the females of *E. festiva* tend to lose their white coloration.

There are disagreements concerning the systematic position of *Eucharia interrogationis*. Below we quote Dubatolov (1996a: 52), who considers *E. interrogationis* as a subspecies of *E. festiva*:

“The type locality of *Chelonia interrogationis* Men. is Kolyvan in Altaiskii Krai (the West Altai). I have seen the type specimen in the collection of Zoological Institute (St. Petersburg) as well as other specimens from this region. All of them are similar to *E. festiva*, but differ from Transbaikalian, Tuvinian, Mongolian and North Chinese specimens that I consider as *E. interrogationis* (Grum-Grshimaïlo).”

However, the type locality of *E. festiva collaris* is the In-Shan Mountains lying between Beijing and Dolon-noor (~150-200 km north of Beijing), i.e. very far way from Kolyvan. In appearance, the moths referred to here also differ considerably from *E. festiva*. The most noticeable distinction is, the wide white collar and two white spots on the prothorax in the female. Instead, *E. festiva* either shows a very thin red collar or it is absent. The upper side of the male abdomen of the moth treated here as *E. interrogationis* is red, except for the last segments, while the female shows a red abdomen with black rings.

This taxon is considered as a separate species by de Freina (1997).

If one accepts *E. interrogationis* as a species bona fide, the ssp. *collaris* Grum-Grshimaïlo, 1899 is rather to be regarded as a subspecies of *E. interrogationis*, not of *E. festiva*. O. Bang-Haas (1927) considered *E. collaris* as an aberration, but this is certainly incorrect. It is even possible that *E. collaris* represents a species of its own while *E. interrogationis* is a synonym of *E. festiva*. In general, the situation concerning the status of *E. interrogationis* remains rather confused.

45. **Eucharia culoti** (Oberthür, 1912)

*Chelonia culoti* Oberthür, 1912: 322, pl. 116, fig. 1028, TL: Ost Sibirien (?).

[culoti – in honour of Swiss entomologist Culot]

Strand, 1919: 340, *Arctia culoti*

Draudt, 1931: 88, *Arctia culoti*

Bang-Haas, O., 1927: 77, *Arctia festiva* ab. *culoti*

Dubatolov, 1996b: 53, *Eucharia festiva collaris*
Description. According to Draudt (1931), alar expanse 46 mm. Head and collar light ochre yellow, collar with two black points. Thorax black, in front with yellow short lines. Base of abdomen red, further light brown with black spots on lateral sides.

Distribution. Pattern East Siberian.
Within the former Soviet Union. East Siberia (?).
Beyond the former Soviet Union. Unknown.

Biology. Flight in the taiga in July.

Note. This species remains unknown to us. Perhaps it is just a form/subspecies of the previous species. According to O. Bang-Haas (1927), proposal of this taxon was unjustified. In contrast, Draudt (1931) considered E. culoti as a “bona species” (“sehr gedrungen gebaute Art”). Dubatolov (1996b) regards this form as a synonym of E. festiva.
A solution to the problem will only be possible after new material is taken and compared with type specimen(s). According to Draudt (1931), A. culoti represents a small species with a wing coloration similar to E. interrogationis.

Similar species. E. festiva has no yellow collar; E. interrogationis has a collar without black spots.

25. Genus Pericallia Hübner, 1820

(Genitalia in Pl. 26, Fig. 4)

= Pleretes Lederer, 1853a: 77, TS: Phalaena matronula Linnaeus, 1758;
= Pleredes Hofmann, 1887: 41 (misspelling)

Palps clothed with highly decumbent hairs, proboscis developed, antennae in both sexes setose. Male genitalia: uncus with a protuberance.
The genus contains about 50 species living in the Palaearctic and Ethiopian regions. Superficially, they are largely dissimilar to the single species occurring in our countries.

Strand, 1919: 258; Pericallia
Fang, 1985: 70; Pericallia
Kôda, 1987: 209; Pericallia

46. Pericallia matronula (Linnaeus, 1758)

(Pl. 12, Figs 1-2)
Phalaena matronula Linnaeus, 1758: 509, TL: Germany.

 [= idriensis Scopoli, 1772; matrona Hübner, 1803]

[matronula – small matron (Lat.)]
[Waldgrund-Buschbär, Augsburger Bär – (Germ.)]
[Ecaille Brune – (Fr.)]

Schultz, 1905: 125, Pericallia matronula centralasiae
Spuler, 1910: 140, Pleretes matronula agassizi
Seitz, 1910: 96, pl. 17, rows f, g, Pericallia matronula
Sheljuzhko, 1926: 56, Pericallia matronula amurensis
Draudt, 1931: 84, pl. 7, row e, Pericallia matronula sachalinensis
Dubatolov, 1996b: 53, Pericallia matronula

Subspecies:
P. m. centralasiae Schultz, 1905
P. m. amurensis Sheljuzhko, 1926
Description. Alar expanse 72-80 mm, female a little larger. Fw dark brown, with three large yellow maculae at costal edge, with one at base and one at external edge, sometimes with 2-3 additional spotlets. Hw yellow with a black region of discal vein. Two rows of irregularly shaped black spots closer to base of wing and to its external edge.

Variability. Distinguished by strong individual variability. In this connection, a number of forms have been described, e.g.,

- f. serena Schultz, 1905 – with a series of submarginal spots on hw;
- f. luteotincta Schultz, 1905 – with orange, not yellow, spots on fw;
- f. agassizi Spuler, 1906 – with a transverse light band traversing fw;
- f. marmorata Schultz, 1905 – with enlarged yellow maculae;
- f. obliterata Sheljuzhko, 1926 – with yellow fws, irregularly and vaguely pollinated brown; hw orange yellow almost without spots.

There are also some geographical forms:

- ssp. amurensis Sheljuzhko, 1926 – “Nikolaevsk-on-Amur”;
- ssp. sachalinensis Draudt, 1931 – Sakhalin, very common;
- ssp. centralasiae Schultz, 1905 – Central Asia.

However, in our opinion these forms show but weak external differences from the nominotypical subspecies.

Distribution. Pattern Euro-Siberian. Within the former Soviet Union. Baltic countries; Belarus; Carpathian Mts, northern and central Ukraine, Moldova; central Russia (up to Leningrad Region in the north, scattered populations in the west of Moscow Region), Upper Volga and lower Kama River regions (Samara, Saratov); patchily in North Kazakhstan; Siberia, i.e. southwestern Siberia (south of 55°N: Tobolsk; Tomsk), the upper and middle flows of Angara River, Irkutsk, Altai, southern Transbaikalia, Cisamuria (Zeya, Svobodnyi); and Primorye, South Sakhalin, Kunashir Island. Beyond the former Soviet Union. Europe: eastern France, southern England, southern and central Germany, Alps, Eastern Europe: Poland, Hungary and Romania; northern Mongolia; Korea, Japan (Hokkaido), China: Dunbei, Hebei, Northern Nei Mongolia, Heilongjiang, Jilin, Liaoning, Shanxi, Ningxia (Fang, 2000).

Biology. Flight in June-July, occurring patchily. Flight usually after sunset, males flying to light, but sometimes males appearing also in the daytime. Eggs pale yellow. Young caterpillar light brown with brownish hairs, last instar caterpillar dark brown with reddish brown hairs. Larvae feeding on numerous plants, including leafed bushes and trees: Lonicera, Hieracium, Vaccinium, Fraxinus, Prunus, Corylus, Quercus etc. In boreal latitudes, e.g. England and Germany, hibernation twice. Pupating in a whitish gray cocoon on the ground.

In Western Europe, moths occur in hills and mountains, over the plains of Belarus and central Russia in woodlands, in Siberia mostly inhabiting steppe and forested steppe landscapes, only partly penetrating the taiga, in the Far East in various places ranging from river valleys to mountains.

In Western Europe, the species is infrequent, sporadic. In Siberia and the Far East, it is very common.

Similar species. There seem to be no similar species in our fauna.

Subfamily Micractiinae

Genus Micractia Seitz, 1910


Dubatolov, 1987a: 30, Micractia

A recent revision of this genus carried out by Dubatolov (1987a) has changed the earlier approaches to its classification. The genus has been split into five genera, mainly on the basis of male genital conformation. Micractia is only to be reserved for M. trigona (Leech), known from the environs of Kanding (Ta-Tchin-Lu, 30° N, 102° E), China. The males of M. trigona (Pl. 15, Fig. 12; Pl. 24, Figs 4-5) can often be encountered in early August in the afternoon in pine woodlands, on forest glades and in the alpine belt at 3000-4500 m a.s.l. Females are short-winged, not capable of
flight (S. V. Murzin, personal communication). In addition to the typical form, the *L. nigra* (Leech, 1899) with a reduced light pattern of the fw and a completely dark hw is known to exist (Pl. 24, Fig. 6).

When splitting the erstwhile *Micrarctia*, Dubatolov (1987a) has erected a new genus, *Ocnogynodes*, to accommodate another Chinese species, *Arctia y-albula* Oberthür, 1866 (Pl. 24, Fig. 3). This type-species was described virtually from the same place as *M. trigona* (25 km to east of Kanding). Based on the structure of the genitalia, this genus is close to *Oenogyna* but differs by winged females. “Palpi moderately long (hardly longer than head pubescence) with dense hairs, eyes large, oval, strongly convex, beset with short ciliae. Antennae of male two-combed, of female serrate. Female with well-developed wings. Fore tibiae short, twice shorter than femur, with a long epiphysis, middle tibiae with one pair, hind tibiae with two pairs, of thin calariae” (Dubatolov, 1987a). As *Arctia y-albula* Oberthür is also the type-species of *Lithosarctia* Daniel, 1954, *Ocnogynodes* is an objective junior synonym of *Lithosarctia*.

Yet another new genus in Dubatolov’s opinion belonging to the tribe Arctiini has been erected: *Sinoarctia* Dubatolov, 1987a, with the type-species *S. kasnakovi* Dubatolov, 1987a, from eastern Tibet. In further detail, this genus has been considered above (p. 51).

Still before Dubatolov’s revision, *Micrarctia* was partly treated by Ferguson (1984), who isolated a new genus, *Palearctia* Ferguson, 1984, considered below. According to Dubatolov (1987a), *Palearctia* is to be merged with, and sunk under, *Tancrea* Püngeler, 1898. However, later Dubatolov (1990) considered both these genera as separate.

Finally, Dubatolov (1990) has established the new genus *Sibirarctia* for two species of *Palearctia*, *P. kindermanni* (Staudinger, 1867) (the type-species) and *P. buractica* (O. Bang-Haas, 1927). *Tancrea*, *Palearctia* and *Sibirarctia* species occur in the former Soviet Union.


*Divarctia* Dubatolov, 1990a: 84, TS: *Oenogyna dica* Staudinger, 1887.

Antennae of male two-combed with long crests. Eye without hairs, large, strongly convex. Fore tibiae with a large epiphysis, with two spines at apex (in difference to species of *Palearctia* and *Arctia*). Middle and hind tibiae with spines...
at apex, middle tibia with one pair, hind with two pairs, of calariae (only one in Ocnogyna). Different from Cymbalophora by certain details of genitalic structure. Female with short wings.

_Dicarctia_ seems to be the closest to _Palearctia_ (cf. Dubatolov, 1990a).

### 47. _Divarctia diva_ (Staudinger, 1887)

(_Pl. 12, Figs 3-4)_

_Ocnogyna diva_ Staudinger, 1887a: 84, TL: W. Tian-Shan.

[= _haberhaueri_ Alpheraky, 1888]

[diva – divine (Lat.)]

Stshetkin, 1972: 106, _Ocnogyna diva_

**Description.** Alar expanse of male 43-45 mm. Fw white with dark brown spots arranged in a few series. Basal series consisting of two spots: one like a wide short line at costal edge, the other in the form of an oblique short line at inner edge of fw. The following, subbasal series consisting of two similarly situated spots, but costal spot angulate while inner spot rounded. 3rd and 4th series including three spots each, those in fourth series largest. Finally, external edge infuscate from apex of fw down to cubital vein. Hw white with two dark spots at external edge. Underside of fw white with pale spots, no spots along hind edge of fw. Antennae of male two-combed with long crests. Female with a short wrinkled fw. Antennae serrate.

**Variability.** Development of black pattern slightly varied.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Mountains of Central Asia: mountains around Fergana Valley, West Tian-Shan (Chatkalskiy, Pskemskiy, Ugamskiy and Karzhantau Mts); Turkestanskiy, Zerafshanskiy and Hissar Mts; Peter-1 Mt. Range, Khozratishokh Mts.

Beyond the former Soviet Union. Unknown.

**Biology.** Moths appear in autumn, in September, in the foothills on slopes overgrown by bushes at 1300-1800 m a.s.l. Males often flying to light, females uncapable of flight. Larvae feeding on various herbaceous plants: _Plantago_, _Achillea_, _Taraxacum_, _Rumex_, _Salvia_, _Astragalus_, _Galium_, _Ulex_, _Artemisia_, _Lactuca_, _Umbelliferae_. Caterpillars hibernating at instar 3.

**Similar species.** _Cymbalophora ricularis_ (Ménétriès, 1832) smaller, with angular black spots, antennae of male simple.

### 27. Genus _Tancrea_ Püngeler, 1898


Tympanic organ absent. A single species in the genus.

### 48. _Tancrea pardalina_ Püngeler, 1898

(_Fig. 49)_


[pardalina – small panther (Lat.)]

Dubatolov; 1991a: 67, _Tancrea pardalina_

**Description.** Small moths with variegated coloration. Alar expanse about 30 mm. Male ochre yellow with brown spots of irregular shape scattered over fw. Hw pattern consisting of roundish submarginal spots, a crescent spot on transverse vein, and two rays running from base of fw to external edge. Female ochre yellow with short wings.
Variability. Probably insignificant.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Dzungarskiy Alatau region (Ili River), Kugart Pass (Fergana Mt. Range), Kara-Kum Desert.

Beyond the former Soviet Union. China (Xining).

No detailed distribution is known. Apparently, this species also occurs in other parts of the Dzungarskiy Alatau region and eastern Tian-Shan (Dubatolov, 1991a).


Similar species. *Orgyia dubia*, with yellow hws with a continuous dark edge.

28. Genus *Holoarctia* Ferguson, 1984

*Holoarctia* Ferguson, 1984: 452, TS: *Grammia cervini* (Fallou, 1864).

= *Orodemnias* Wallengren, 1885, TS: *Bombyx quenseli* Paykull

The genus is established based on structure of the genitalia and some other features, being close to *Palearctia*. It differs by the colour pattern in the hws having five white transverse bands instead of four in *Palearctia*. O. Bang-Haas (1927) assigned this group of species to the genus *Orodemnias* Wallengren, 1885.

Key to species of *Holoarctia*:
1. Hws uniform dark. ......................................................................................................................................... *H. cervini*
   – Hws yellow or white. ........................................................................................................................................ 2
2. Hws yellow with several dark submarginal spots. ............................................................................................. *H. mariae*
   – Hws white with several dark submarginal spots. .............................................................................................. *H. puengeleri*

49. *Holoarctia cervini* (Fallou, 1864)

(Pl. 12, Figs 7-8)

*Nemeophila cervini* Fallou, 1864: 23, pl. 1, fig. 2, TL: Matterhorn, Switzerland.

[= *hnatecki* Frey, 1872; *rougemonti* O. Bang-Haas, 1927; *scriniensis* Berthet, 1948; *stettei* Rober, 1930; *teriolensis* Burmann, 1975; *splendida* Gerber, 1979]

[cervini – reindeer (Matterhorn, Mons cervinus, Cervine mountain) – the mountain in Switzerland, whence this moth has been described (Lat.)]
McDunnough, 1921: 167, *Holoarctia cervini sordida*
Torstenius, 1971: 173, figs 1-2, *Orodemnias cervini fridolini*
Dubatolov, 1990c: 152, *Holoarctia cervini perunovi*
Dubatolov, 1996b: 54, *Holoarctia cervini, Holoarctia cervini puengeleri*

**Subspecies:**
- *H. c. sordida* McDunnough, 1921
- *H. c. fridolini* (Torstenius, 1971)
- *H. c. perunovi* Dubatolov, 1990c.

**Description.** Alar expanse about 30 mm. Fw light, yellowish with diffused dark gray spots, sometimes a dark background dominating. Veins coated with yellow blossom dust. Hw dark gray with yellow pollination at edge of wing and with a yellow fringe. Abdomen black with yellow transverse lines. Patagia and tegula with a yellow border.

**Variability.** The f. *hnatecki* Frey, 1872, from Tyrol, differs from the nominate form by the uniform color of the wings, the strongly reduced black pattern of the fws and the completely yellow hws.

The following subspecies are known:
- ssp. *perunovi* Dubatolov, from the Altais and Mongolia, differing by the rounded fw without light pollination on the veins; hw uniform black;
- ssp. *fridolini* (Torstenius), inhabiting the polar regions ranging from Scandinavia to Chukotka and Alaska; sometimes the ssp. *fridolini* is considered as a “good” species;
- ssp. *sordida* McDunnough – Alberta, Canada.

**Distribution.** Pattern boreo-alpine.
Within the former Soviet Union. Kola Peninsula, Urals, southern Siberia (Altai and Sayan Mts, Khamar-Daban Mt. Range), Verkhoyanskiy Mt. Range, Kamechatka, Chukotka.
Beyond the former Soviet Union. Europe (Alps, polar parts of Scandinavia), Asia [North Korea (Kóda, 1988: as “Hyperborea czekanowskii”); Mongolia]; North America (Alaska; Canada: Alberta (ssp. *sordida* McDunnough)).

*H. cervini* is a circumpolar species. Its presence in the Alps as well in the mountains in southern Siberia obviously reflects its relict character at the southern periphery of the distribution area.

**Biology.** The species inhabits elevated, alpine parts. Flight in the daytime in July-August. Caterpillar black with fascicles of black hairs and an interrupted light stria on each lateral side. Head black. In the Alps, caterpillars feeding on various herbaceous plants like *Primula farinosa*, *Saxifraga*, *Silene* etc. In the daytime, often resting on stones or bare ground.

The biology of our subspecies is unknown.

**Similar species** *H. marinae* Dubatolov, has a fuzzy light pattern.

50. *Holoarctia marinae* Dubatolov, 1985

(Pl. 12, Figs 5-6; Fig. 50; genitalia in Pl. 26, Fig. 5)


[marinae – after a feminine name, Marina]

Dubatolov, 1985b: 152, figs 2v, 3b, *Holoarctia marinae*
Dubatolov, 1985d: 57, *Holoarctia marinae*

**Description.** Alar expanse of male 30 mm, of female 36 mm. Fw ashy gray with a yellowish diffused pattern like transverse dentate stripes (two submarginal stripes most appreciable). Hw dull gray with diffuse dark spots (spots larger in female). Body black, legs of male with yellow maculae.

**Variability.** Reflected by certain reduction of yellow pattern (a series of 10 specimens).

**Distribution.** Pattern South Siberian.
Within the former Soviet Union. Altais (Terektinskiy and Kuraisky Mt. ranges).
Beyond the former Soviet Union. Unknown.

**Biology.** Flight at 2600-2800 m a.s.l. on steep taluses covered with scarce vegetation. Red-haired caterpillars in the afternoon hiding under stones, pupating there. Pupa in a thin cocoon, prolate, coated with bluish pollination. Pupation in June, moths appearing in the middle of July. Caterpillar hibernating.

**Similar species.** *H. cervini* (Fallou), has a more strongly developed and clear light pattern.

51. *Holoarctia puengeleri* (O. Bang-Haas, 1927)

(Pl. 12, Figs 10-11)

*Orodemnias puengeleri* O. Bang-Haas, 1927: 60, pl. 8, fig. 14, TL: Sayan (Sayan mount.: Obo Sarym and Munko Sardyk).

[puengeleri – in honour of entomologist Rudolf Püngeler (Lat.).]

**Description** (based on female). Alar expanse 41 mm. Fw gray-black with thin whitish pollination on veins and with five transverse stripes. Two most clear external stripes sometimes bridged in the middle of fw, forming an X-shaped pattern. Two following stripes, both also beginning at costal edge, promptly coming to end, with only a basal, thin, white strip reaching the hind edge. This strip forming a sharp angle in the middle of fw. Hw dirty white with small, fuzzy, dark maculac. Body dark, abdomen with yellow rings.

**Distribution.** Pattern circumpolar.

Within the former Soviet Union. Arctic part of Europe and Asia, Urals, Altais, Sayan, Chukotka.
Beyond the former Soviet Union. Polar Europe and Alaska.

**Biology.** In the mountains, flight in the afternoon from July to early August at 2000-2500 m a.s.l. on taluses. Caterpillar hibernating, pupating under stones.

**Similar species.** *H. cervini* (Fallou), has a clearer network of light strips. Hw dark.

**Note.** Dubatolov (1996b: 54) considers this species as a subspecies of *H. cervini*. However, Draudt (1931: 77) regarded *Orodemnias puengeleri* as a separate species (“A highly interesting discovery from the Sayan Mountains”). Draudt was probably right. The external differences of this form from the typical *H. cervini* are very considerable.
29. Genus *Palearctia* Ferguson, 1984


Dubatolov, 1996ba: 9, *Palearctia*

Small moths inhabiting high mountains, as a rule. Wing pattern of Type I. Fw dark with a white pattern, hw varied in coloration: red, yellow, black. Antennae bipectinate. Eye small, proboscis short or missing. Tympanic organ absent (in difference from *Tanrea*).

The status of many forms in this genus is unclear. For example, many consubgener appear to occur in Central Asia, including Tian-Shan and Pamiro-Alai. Thus, both *Micrarctia glaphyra schottlanderi* (Strand, 1912) and *M. glaphyra sehnosi* (Böttcher, 1905) seem to have been described from the same place (“Narynsk” or “Naryn”) in the Central Tian-Shan (cf. O. Bang-Haas, 1927).

Dubatolov has introduced the following subgenera:

The subgenus *Centrarctia* Dubatolov, 1990d, monobasic, with the type-species *Arctia mongolica* Alpheraky, 1888, and the nominotypical subgenus with all remaining species.

Key to species of *Palearctia*:

1. Hw gray or white. ................................................................................................................................. 2
   - Hw of different colour. .......................................................................................................................... 5
2. Hw gray with indistinct white gleam. Pattern of upper side of fw consisting of longitudinally elongated spots with light veins. Altais. ................................................................................................................................. *P. mira*
   - Hw white with dark spots. ..................................................................................................................... 3
3. Upper side of fw with three separate spots on common basal band running along hind edge. .......... *P. golbecki*
   - Two separate spots (median missing or barely marked) along hind edge of fw. .............................. 4
4. Discoidal cell on underside of fw with two rounded spots, one in the centre of cell, the other on discal vein. ................................................................. *P. rupicola*
   - Discoidal cell on underside of fw with a dark strip running from base of wing to the middle of cell. ................................................................. *P. sarycola*
5. Hw red or orange. .................................................................................................................................. 6
   - Hw yellow. ......................................................................................................................................... 12
6. Pattern on fw consisting of sharp white or yellow stripes ........................................................................ 7
   - Pattern on fw diffuse. .......................................................................................................................... *P. wagneri*
7. Light stripes on fw ochre yellow. ........................................................................................................... *P. dublitzkyi*
   - Pattern on fw consisting of white stripes. .......................................................................................... 8
8. External edge of hw bordered with a thin black line from costal edge on. Spots of submarginal series large. Discoidal spot present. ....................................................... *P. glaphyra*
   - External edge of hw red. From apex along external edge a thin submarginal strip or an arcuate spot and sometimes small points. Discoidal spot absent. ................................................................. *P. mongolica*
9. Thorax white with three black striae. ...................................................................................................... *P. mongolica*
   - Thorax uniform black. .......................................................................................................................... 10
10. Spot at apex of hw removed from edge, apex of hw light. A thin dark strip can be present at edge of hw. ................................. *P. erschoffi*
   - Apex of hw infuscate; spot at apex merged with a dark edge of wing. Black short rays running from base. ................................................................. *P. fergiana*
11. Base of fw light, without infuscation, marginal spots small or absent. ..................................................... *P. erschoffi*
   - Base of fw with dark short strips or spots. Submarginal spots large (about 2 mm). ............................ 12
12. Discoidal spot on hw present. Black short rays running from base of wing. ....................................... *P. gracilis*
52. *Palearctia (Palearctia) mira* Dubatolov & Tshistjakov, 1989

(Pl. 12, Fig. 9)

*Palearctia mira* Dubatolov & Tshistjakov, 1989: 141, figs 1-2, TL: Kurayskiy Mt. Range (Altai, environs of Aktash, Fig. 51).

[mira – wonderful (Lat.)]

**Description.** Male: alar expanse 27-29 mm. Fw black with white striolae on all veins. Cubital vein with a wider stria from base of wing until transverse vein. White, narrower stria instead on an undeveloped vein A1. A white dot located at cell centre. External part of fw with a white, transverse, sinuous band. Hw dark gray with whitish thin striae at edge of wing and on transverse vein.

Female with a yellowish gray hw with weakly expressed diffusive spots.

**Distribution.** Pattern South Siberian.

Within the former Soviet Union. Altai (Kurayskiy Mt. Range).

Beyond the former Soviet Union. Unknown.

**Biology.** Flight in the daytime in July on rocky slopes at 2500-2700 m a.s.l. Caterpillar pupating on grassy slopes under stones in a loose cocoon. Pupa pollinated bluish.

**Similar species.** In our fauna, no similar species seem to occur.

53. *Palearctia (Palearctia) glaphyra* (Eversmann, 1843)

(Pl. 13, Figs 1-6; Fig. 52)


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![Fig. 51. Russia, Altai Mts, Kuraiskiy Mt. Range, head of Aktash Valley, the talus at right, at 2700-3000 m a.s.l., supporting *Dodia sazonovi* Dub.(TL), *Acerbia alpina* (Q.) and *Holoarctia cervini perumoci* Dub., at left both *H. marinae* Dub.(TL) and *Palearctia mira* Dub. & Tschist.(TL) (photo by V. S. Murzin).]
[= manni Alpheraky, 1882; naryna O. Bang-Haas, 1927]

[glaphyra – a feminine name]

Staudinger, 1881: 402. Arctia glaphyra manni
Böttcher, 1905: 63, pl. 53, figs 4-12. Micrarctia glaphyra gratiosata (=gratiosa Seitz, non gratiosa Groum-Grushimaio)
Böttcher, 1905: 61. Micrarctia glaphyra i. puengeleri
Seitz, 1910: 83, pl. 16, row i, Micrarctia glaphyra
Bang-Haas, O., 1927: 62, Pl. 13, Fig. 2. Micrarctia glaphyra ab. flaca
Bang-Haas, O., 1927: 62, pl.8, fig. 23, Micrarctia glaphyra ab. illustrata
Bang-Haas, O., 1927: 62. Micrarctia glaphyra ab. nigroradiata
Bang-Haas, O., 1927: 63, pl. 8, fig. 28. Micrarctia glaphyra naryna
Bang-Haas, O., 1927: 63, pl. 8, figs 26-27. Micrarctia glaphyra aksuensis
Ferguson, 1984: 454, Palearctia glaphyra
Dubatolov, 1996b: 55, Palearctia glaphyra glaphyra, P. glaphyra aksuensis
Fang, 2000: 342, pl. 6, fig. 6, Palearctia glaphyra

Subspecies:
ssp. manni Staudinger, 1881: 402
ssp. aksuensis O. Bang-Haas, 1927: 55 (= naryna O. Bang-Haas, 1927: 63) (Fig. 52).

Description. Male alar expanse 30 mm, female a little smaller. Fw dark, almost black, with thin white striae (Pl. 13, Fig. 1). Hw red with black submarginal spots and a black, crescent-shaped, discal spot. Sometimes external edge of wing with a thin black stria. Black pattern on fw of female being strongly reduced, background colour of wing white. Black pattern like angular spots or short striae.

Variability. Individual variation becomes clear when different forms are considered:

Fig. 52. Mating pair of Palearctia glaphyra aksuensis (O. B.-H.), Kazakhstan, River Orta-Kolpak, 3000 m a.s.l., 18.VII.1993 (photo by V. S. Murzin).
f. *flava* – yellow hws (Pl. 13, Fig. 2);
f. *illustrata* – white hws with a black pattern;
ab. *gratiosata* Böttecher, 1905 – both discal spot and boundary stria on hw lost;
f. *puengeleri* – black hws (Pl. 13, Fig. 3).

There are many other forms or aberrations: ab. *rosearea* Seitz, 1910 (Staudinger, in litt.) has a pink, not white pattern on the fw; ab. *obscurata* Böttecher, 1905 with darkened hws; ab. *annabilis* Böttecher with a whitish median belt on the fw, and so on.

A number of subspecies are known, among which the following seem noteworthy:

- **ssp. *glaphyra*** – mountains of eastern Kazakhstan (environs of Zaisan, Dzungarskiy Alatau, Tyshkan-Tau Mts) and adjacent regions of China;
- **ssp. *manni*** – East Tian-Shan (Kungess, China);
- **ssp. *aksuensis*** – environs of Khan-Tengry Peak, Central Tian-Shan (Pl. 13, Figs 1, 2, 4) (“mountains north of Aksu”) and Yuldus, China; distributed in the Zailiiskiy Alatau, the eastern part of Terskey Alatau Mts, the southern part of Central Tian-Shan (Kaingdy-Katta Mt. Range, Inylechek, Kokshaal-Tau Mts), China (Xinjiang).

Available material from the northern slopes of Kaingdy-Katta Mts (at about 2700 m a.s.l. – ssp. *aksuensis*) and from near Orta-Kokpak River, in the source area of Tekes River, Terskey Alatau Mts, fails to show noticeable differences from specimens from the environs of Alma-Ata. As at Alma-Ata, Zailiiskiy Alatau Mts, the species *P. dublitzkyi* (O. Bang-Haas, 1927) is known to occur, this taxon cannot be a subspecies of *glaphyra* because of sympathy. We believe that the Zailiiskiy Alatau Mts support *P. glaphyra aksuensis* and *P. dublitzkyi*, the latter a bona species;

- **ssp. *naryna*** – Naryn, Central Tian-Shan; this moth shows bright red hws, yet in the limits of the usual variation range of *P. glaphyra*. Dubatolov (1996a) regards this form as a synonym of *P. glaphyra aksuensis*. We think that he is right;

- **ssp. *manni* Staudinger (= *mannii* Alpheraky) – Eastern Tian-Shan, upper reaches of Kungess River, Arshan, China. This subspecies does not seem to occur in our territory;

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Dzungarskiy Alatau (and the mountains south of Lake Zaisan), Khan-Tengry Mt., Kaingdy-Katta Mt. Range, upper reaches of Inylechek River, Kilu Mt. Range, Orta-Kokpak River (a tributary to Tekes River, Terskey Alatau), Zailiiskiy Alatau; Central Tian-Shan, up to Naryn and Dolon Pass in the west.

Beyond the former Soviet Union. Northwestern China (Xinjiang: source area of Kungess River, Kulja), Kuruktag Mts [Tibet (environs of Everest)?].

**Biology.** Flight in July to early August at elevations above 2500 m a.s.l. in noon time, females poorly active. Eggs of green colour laid in groups. Caterpillars feeding on various herbaceous plants (in lab conditions well reared on dandelions). Caterpillars of instars 3-4 hibernating. Last instar caterpillars almost black, coated with fascicles of black hairs on black warts. In the daytime, caterpillars hiding under stones. Pupation there at the end of June in a very loose cocoon consisting of a small number of threads. Pupa pollinated bluish, at the caudal end with remains of a larval skin.

**Similar species.** *P. ferghana* and *P. gratiosa*, with a dark apical part of the hw; black spots are moved to the edge.

### 5. *Palearctica (Palearctica) dublitzkyi* (O. Bang-Haas, 1927)

(Pl. 13, Figs 7-8)


[dublitzkyi – after Russian entomologist Dublitzky]

Dubatolov, 1996b: 15, *Palearctica glaphyra dublitzkyi*

**Description.** Male alar expanse 33 mm, female a little smaller. Superficially very similar to *P. glaphyra*. Light pattern on fw considerably expanded. Colour of pattern not white but golden yellow or light ochre. Hw pink with large black spots. External edge often with a thin black stria (Pl. 13, Fig. 7). Female background colour of fw white with a weakly expressed black pattern. Black longitudinal strokes along external edge of fw (Pl. 13, fig. 8).
Variability. Within the distribution area known to us, no meaningful variability is observed, individual variation being reduced to loss of a discal spot on the hw. Available material (19 specimens) seems to reveal no other differences. There is an aberration (ab. *victori* Dublitzky, 1925) with a reduced black pattern, fws only with two black spots on vein R2 and one on Cu2, hws without spots on veins A2 and A3.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Our material derives only from the environs of Alma-Ata, Zailiiskiy Alatau (Talgar, Medeo, Kum-Bel). Dubatolov (1996a) records many other places: “Zailiiskiy Alatau; Kungey Ala-Tau in Kazakhstan and Kirghizstan”.

Beyond the former Soviet Union. Unknown.

Biology. Adults flying in early August at about 3000 m a.s.l. Caterpillar superficially typical of the genus, in the daytime hiding under stones on taluses; pupation there in a loose cocoon.

Similar species. *P. glaphyra* has a white pattern over a dark background. The female shows no black longitudinal strokes at the fw external edge.

Note. Contrary to Dubatolov (1996), Draudt (1931) and O. Bang-Haas (1927) who consider this taxon as a subspecies of *P. glaphyra*, we regard *P. dublitzkyi* as a “good” species, because it co-occurs together with *P. glaphyra* (*aksuensis*?), and the moth flies a little later, in August instead of July as known for *P. glaphyra*.

55. *Palearctia (Palearctia) gratiosa* (Groum-Grshimailo, 1890)

(Pl. 13, Figs 9-10)

*Arctia glaphyra* var. *gratiosa* Groum-Grshimailo, 1890: 533, pl. 19, fig. 5, TL: “Arteha-Bash” (northern slope of Alaiskiy Mt. Range), 9500 ft.

[gratiosa – pleasant, lovely (Lat.)]

Fig. 53. Uzbekistan, Turkestanskiy Mt. Range, Kum-Bel Pass, 3200 m), habitat of *Palearctia ferghana* (Stgr.), *Palearctia gratiosa* (Gr.-Gr.) and *Arctia rueckebeli* (Pugl.) (photo by V. S. Murzin).
Hampson, 1894b: 18, fig. 5, Ocnogyna postflavida
Hampson, 1901: 238, 132, Ocnogyna postflavida
Bang-Haas, O., 1927: 63, pl. 8, fig. 32, Micrarctia glaphyra gratiosa
Bang-Haas, O., 1927: 62, pl. 8, fig. 31, Micrarctia glaphyra ab. nigromarginis
Reich, 1933: 312, Micrarctia gratiosa lochmatteri
Ferguson, 1985: 222, figs 44, 101-102, Palcarctia kashmirica
Dubatolov, 1996b: 24, figs 4f, 9a, 9c, Palcarctia gratiosa caroli
Dubatolov, 1996b: 24, figs 4g, 8h, Palcarctia gratiosa sergei
Dubatolov, 1996b: 25, Palcarctia gratiosa postflavida, Palcarctia gratiosa flavala

Subspecies:
P. g. sergei Dubatolov, 1996b
P. g. caroli Dubatolov, 1996b
P. g. flavala Dubatolov, 1996b.

**Description.** Alar expanse 26-30 mm. Fw dark gray with darker, almost black, angular maculae. White pattern rather thin, including an X-shaped pattern in external part of fw and a white longitudinal stria above vein A. This stria connected by a white short strip with inner edge (pattern of Type I). Hind edge of fw darkened, centre of costal edge sometimes with a white spot reaching the middle part of cell. Hw yellow with dark costal edge and apex. Besides, 2-3 partly merged black spots near edge of hw. Spot on discal vein missing.

**Variability.** Apparent in the degree of development of the white pattern and main colour, latter varying from white to yellowish, pinkish or grayish. The hws may be of a different colour: sometimes orange, yellow or grayish white instead of the normally red. The discoidal spot may be well-developed or absent. Veins are often covered with black scales at the wing base.

Several subspecies are known:
ssp. gratiosa (Groum-Grshimaïlo) – eastern Zaalayskiy Mt. Range, Central and West Pamirs;

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**Fig. 54.** Tajikistan, central Pamirs, Fortambek Glacier at 4000 m, habitat of *Palcarctia gratiosa* (Gr.-Gr.) and an *Oroncus* species (photo V. S. Murzin).
ssp. corolii Dubatolov, 1996b – Chatkalskiy and Kirghizskiy Mt. ranges; hw reddish at base and the centre of wing but yellowish at external and costal edges; yellowish to red ratio can vary; discoidal spot sometimes absent;

ssp. sergei Dubatolov, 1996b – southern slopes of Terskey Alatau Mts; differing from the nominotypical form by the large size (fw 15 mm in length, alar expanse 31.5 mm); hw orange, with large contrasting discoidal and submarginal spots; veins dark; spots of fw contrasting, V-shaped spot being well-developed (Dubatolov, 1996b);

ssp. flavala Dubatolov, 1996b – Zeravshanskiy, Turkestanskiy and Hissarskyi Mts; fw as in the ssp. gratiosa but hws always yellow.

Several subspecies have been described from beyond the former Soviet Union:

ssp. postflavida (Hampson, 1894b) – Kashmir, Skoro-la, 15,000 f, Sichuan, China;

ssp. lochmattari (Reich, 1933) – “Third side valley of Shyok Valley, 4800 m”.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. West Tian-Shan (Chatkalskiy and Kirghizskiy Mt. ranges), Terskey Alataoo; Pamirs-Alai (Alaiskiy, Transalaiskiy, Turkestanskiy, Hissarskyi and Zeravshanskiy Mt. ranges); Pamirs (Peter-1 and northern Academy of Science Mt. ranges).

Beyond the former Soviet Union. Afghanistan (Karakorum); India (Kashmir); western China.

**Biology.** Flight (males) in July in the second half of the day on grassy mountain slopes at more than 3000 m a.s.l. Near Fortambeek Glacier, Peter-1 Mt. Range, Pamirs (Fig. 54), pupae were found under a stone at 4050 m a.s.l., 11.VII.1987.

**Similar species.** *P. glaphyra*, costal and external edge of hw light; spot on median vein of hw present; hw usually red.

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*Fig. 55.* Kirghizia, W. Tian-Shan, Chatkal Mts, near Lake Sary-Chelek, above the edges of mountains at 3000 m supporting both *Pulexeris gracilis* Dub. (TL) and *P. golbecki* Dub. (photo by V. S. Murzin).
56. *Palearctia (Palearctia) gracilis* Dubatolov, 1996

(Pl. 12, Figs 11-13)

*Palearctia gracilis* Dubatolov, 1996a: 31, fig.10g-h, TL: “Lake Sary-Chelek” (Chatkalskiy Mt. Range).

[gracilis – gracile, orderly, thin (Lat.)]

**Description** (based on three paratypes). Superficially very similar to *P. erschoffi* (Alpheraky, 1882) and some others congers. Alar expanse 23-25 mm. Fw black with a white pattern consisting of four wide transverse bands and a narrow longitudinal band passing closer and parallel to inner edge. Two external bands merged or nearly so in medial part of wing, forming an X-shaped pattern (pattern of Type I). Fringe white. Hw from brick red to yellow with three black spots along, and some distance off, external edge, latter with a thin black strip, a black spot on discal vein. A black strip running along inner edge of wing from its base to middle. Underside of wings yellow with a spotty pattern.

**Variability.** The colour of the hws varies from red to yellow.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Chatkalskiy Mt. Range (Fig. 55).

Beyond the former Soviet Union. Unknown.

**Biology.** Flight at 2-3 m above the ground over herb-clad mountain slopes and crests of mountain ridges at about 3000 m a.s.l. in the beginning of August.

**Similar species.** *P. erschoffi*, has only a narrow black bracket near the apex of the hw. Median spot missing. Hws bright red.

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**Fig. 56.** Kirghizia, Central Tian-Shan, Kaingdy-Katta Mt. Range, type locality of *Palearctia ceugneri* (Pngl) (photo by V. S. Murzin).

*(Pl. 13, Fig. 15)*


[golbecki – in honour of the first collector, A. Golbeck]

**Description** (based mainly on a paratype). Male. Alar expanse 22-24 mm. Head covered with dark brown hairs, antennae bipectinate, with combs of equal length and several times as wide as diameter of antennal stem. Body relatively short, stout, covered with thick brownish black hairs. Patagia, tegula, two longitudinal bands on thorax covered with gray hairs. Lateral sides, caudal end and underside of abdomen also gray. Fore tibia short (~1.5 mm), with a large epiphysis. A single pair of calariae on middle tibia and two pairs of calariae on hind tibia slightly shorter than tibia’s diameter. Wings with sharp apices. Disposition of spots on fw as in *P. glaphyra*. Hw white, with dark veins, discoidal spot and wide marginal stria. General view of underside similar but strongly lightened. Underside dirty white with a black spotted pattern. Separate black spots at edge of hw. Hw with a diffuse brown spot also at costal part of base.

General structure of male genitalia as in *P. glaphyra* but aedaeagus dorsally without spikes in distal part, vesica structure also different.

We have not seen a female. Dubatolov (1996a) has given the following description:

“The length of the fw (of the female) is 9.5 mm, the alar expanse is 21 mm. The head is covered with brownish gray decumbent hairs. The palpi are stretched forward. The antennae are biserrate. The body is thick, cylindrical, 11.5 mm in length, clothed with dense brownish black hairs. The margins of the tegula, patagia, two longitudinal bands on the thorax and the underside of the abdomen, as well as the uniformly coloured legs, are coated with brownish gray scales. The calariae are short, not longer than half of the tibia’s diameter. The wings are very narrow, with contrasting black strokes, one in the middle of the cell, the other behind the base of vein Cu2, a discoidal spot, a transverse spot between the base of veins Cu1 and Cu2, a spot between veins M1 and M2, another one in the distal part of vein Cu2, and three spots along and in front of vein A1. The marginal part of the wing is slightly darkened. The hw is almost entirely dark brown with a clear lightened space between veins M and Cu1 and a weakly lightened space behind vein Cu2. The pattern of the wing underside is similar, but strongly lightened”.

**Variability.** Only several specimens are known.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Kirghizskyi, Mt. Range (Tshai-Sandyk, Tyuz-Ashu Pass, 3400 m).

Beyond the former Soviet Union. Unknown.

**Biology.** Flight in the end of June and in July on grassy slopes at 3000-3500 m a.s.l.

**Similar species.** *P. glaphyra*, has only a thin black strip at the hw edge and a small black spot not merged with the boundary strip, or the hw is uniformly black.

58. *Palearctia* (Palearctia) *rupicola* (Groum-Grshimaïlo, 1890)

*(Pl. 14, Fig. 5)*

*Micrarctia rupicola* Groum-Grshimaïlo, 1890: 535, pl. 19, fig.6, TL: Zaalayskiy Mt. Range, headwaters of Aram River (“Transalai: Oberlauf des Flusses Aram”). Holotype in ZISP.

[rupicola – rock-dweller (Lat.)]

Staudinger, 1892a: 251, pl. 3, fig. 6, *Arctia glauca*

Ferguson, 1985: 222, figs 44, 101,102, *Palearctia kashmirica*

**Subspecies:**

*P. r. kashmirica* Ferguson, 1985.

**Description.** Superficially, close to *P. gratiosa* (Groum-Grshimaïlo, 1890). A part of the original description is quoted below:
“Arctia rupicola” Gr.-Gr. Alis anticis nigro fuscis, in parte externa multo palidioribus, fuscescente striatigatis; postieis fuscescentibus, in venis basin versus fuscato-atomatis et pariter pallidioribus; macula discocellarii tribusque macula submarginalibus per magnis et fere confluentibus – fuscis.

(♀ – ignotus; ♂ = 12 mm.”

“Fw from above almost black, except the part of fw near external edge. Pattern chequered. Spots disposed approximately as in glaphyra Ev. Hw gray-white but with frail pink tint. External edge and veins darker, discoidal spot very large. This spot virtually merging with a wide black-brown spot occupying entire apex of wing.

Abdomen short; thorax coated with brown-black hairs in two longitudinal clear bands and with collar of same colours. Fore part of abdomen almost black, subsequent coated with yellowish scales. P. rupicola mainly comes close to glaphyra, but it shows rather essential differences with all known forms of this species. However, the nearest is our var. gratiosa. The large marginal spots, the lack of a fourth spot in the delta pattern, the completely different coloration and the brightly expressed discal spot allow us to distinguish rupicola from all known forms of gratiosa Groum-Grshimaïlo” (Groum-Grshimaïlo, 1890: 535).

Provisionally, the full specific status of this form is retained before accumulation of new material. In the Aram Canyon, different forms from the rupicola–gratiosa group indeed co-occur.

Variability. Modest.

Ssp. kashmirica Ferguson, 1985, described from Baltistan, Kashmir, India. This moth is very close to the nominotypical form but differs by the diffuse pattern on the fw.

Distribution. Pattern Central Asian.

Within the former Soviet Union: Zaalayskiy Mt. Range, Pamirs.

Beyond the former Soviet Union: India (Kashmir)

Biology. “P. rupicola was found under a stone in the Aram Canyon, Transalai Mountains, at an elevation of approximately 10,000 ft. Locality: steep slopes and rocky talus, beginning of July” (Groum-Grshimaïlo, 1890: 535). Flight in the daytime at more than 3000 m a.s.l. in mid-July to early August. Restricted to overgrown taluses and rocks.

Note. Dubatolov (1987a) regards P. rupicola as a synonym of P. gratiosa, yet no arguments to support this opinion have been provided. As Groum-Grshimaïlo (1890) described and clearly distinguished both forms in the same paper, we follow his opinion. A picture of the holotype is given in Dubatolov (1987a) while a little sketchy pattern in Groum-Grshimaïlo (1890).

Similar species. P. gratiosa (Groum-Grshimaïlo, 1890).

59. Palearctia (Palearctia) wagneri (Püngeler, 1918)

(Pl. 13, Fig. 14)

Arctia wagneri Püngeler, 1918: 46, TL: Sary Djas. Tian-Shan.

[wagneri – after German entomologist Wagner]

Dubatolov, 1996b: 18, Palearctia wagneri

Description. Alar expanse 36 mm. Fw almost black with diffuse white spots as remains of the usual pattern of the glaphyra group. Hw pink or yellow without median spot, but with small rounded spots at edge. A diffuse dark stria running from base of hw parallel to inner edge. Head and body black.

Distribution. Pattern Central Asian.

Within the former Soviet Union: Tian-Shan (“Sarydzhas”), Kaingdy-Katta Mt. Range (Fig. 57).

Beyond the former Soviet Union: Unknown.

Biology. Flight in the daytime above clayey slopes at 2500-2800 m a.s.l. in July.

Similar species. Absent.

60. Palearctia (Palearctia) erschoffi (Alpheraky, 1882)

(Pl. 14, Figs 1-2; Figs 58, 59; genitalia in Pl. 26, Fig. 6)

Arctia erschoffi Alpheraky, 1882: 29, pl. 1, fig. 33, TL: “Yulduz” [= Julduz, Xinjiang, China].
[erschoffi – in honour of Russian entomologist N. Ershov = Ershoff]

Staudinger, 1887: 82, Arctia erschoffi issyka
Böttcher, 1905: 62, figs 18-21, Arctia erschoffi selmonsi
Seitz, 1910: 84, pl. 16, row k, Micrarctia kindermannii erschoffi
Bang-Haas, O., 1927: 66, pl. 8, fig. 44, \*, fig. 45, \^., Micrarctia kindermannii issyka
Bang-Haas, O., 1927: 67, pl. 8, fig. 47, Micrarctia kindermannii korlana
Ferguson, 1985: 219, figs 41, 105, 106, Palearctia erschoffi
Dubatolov, 1987: 33, Tancrea erschoffi
Dubatolov, 1996b: 26, Palearctia erschoffi erschoffi
Fang, 2000: 343, pl. 6, fig. 8, Palearctia erschoffi
Pljustsch & Dolin, 2000: 436, figs 7-8, Palearctia erschoffi sarydzhasica
Pljustsch & Dolin, 2000: 436, fig. 9, Palearctia erschoffi arcana
Pljustsch & Dolin, 2000: 436, figs 10-12, Palearctia erschoffi miranda

Subspecies:
- P. e. issyka (Staudinger, 1887)
- P. e. selmonsi (Böttcher, 1905)
- P. e. sarydzhasica Pljustsch & Dolin, 2000
- P. e. arcana Pljustsch & Dolin, 2000

**Description** (based on material from Kaingdy-Katta Mt. Range). Alar expanse of male 26-28 mm. Fw black with a white pattern. An arcuate thin stria running from base of wing to tornal angle of external edge. Two external transverse striae bridged in the middle of wing and forming an X-shaped pattern. A third, wider stria starting in the middle of costal edge of-fw and reaching to sometimes intersecting the white arcuate longitudinal stria, but usually not reaching the inner edge of wing. A rather thin, basal, transverse stria reaching the inner edge, interrupted at white longitudinal stria. Fringe of external edge white. Hw red with a black are along external edge. Are beginning at costal edge, reaching up to 1/4 external edge, at 1.5 mm off latter. Apex of hw red. Black points lying 1.5 mm off external edge often present in latter’s
medial part. Costal edge of hw and fringe yellow. Underside of fw yellowish with a reduced black pattern but with a clear, black, oval spot in the middle of medial cell. Hw underside red orange in colour. Black pattern same as from above. A black dot in the middle of costal edge. From above, head, thorax and abdomen black, underside of abdomen yellowish.

Variability. Individual variability is displayed in the width of a white pattern and in size variation of black spots on the hw. Sometimes spots on the hw are absent and the wings become uniform orange-red or red. Sometimes the third transverse band on the fw is broken into separate spots.

The following subspecies are known:

- ssp. erschoffi – Yuldus, Kulja, Lake Issyk-Kul; spots on hw large, coloration of hw orange red;
- ssp. issyka – “probably from the mountains east of Tashkent” (O. Bang-Haas, 1927: 66); as the picture of a type shows (O. Bang-Haas, 1927), this form is distinguished by the ochre yellow background of the fw and the larger spots on the hw (= erschoffi erschoffi sensu Dubatolov, 1996a: 28);
- ssp. selmonsi – Inner Tian-Shan (Naryn); pattern of the fw yellowish instead of white, hw red, black spots reduced;
- ssp. sarydzhasica – Central Tian-Shan, northern slope of Kaingdy-Katta Mts; background colour of fw pale yellow, coloration of dark pattern chestnut brown. Based on material from Kaingdy-Katta Mts, only a small part of the population seems to be coloured like typical sarydzhasica while the majority appear to represent typical erschoffi. This alone suggests their synonymy;
- ssp. arcana – Tian-Shan, point of junction of Talasskiy and Kyrghizskiy Mt. ranges, west of Tyuz-Ashu Pass. Background colour of fw lemon yellow; light pattern on fw very extensive;
- ssp. miranda – West Tian-Shan, Talasskiy Mt. Range, Kara-Bura Pass; background colour of fw orange yellow; dark pattern of fw black; hw red.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Environ of Lake Zaisan, Tian-Shan (Chatkalskiy Mt. Range, Zailiiskiy Alatau, eastern Terskey Alatau (tract Orta-Kokpak), Kaingdy-Katta Mt. Range, Naryn), Pamirs-Alai (Alaiky Mt. Range).

Beyond the former Soviet Union. China: Yulduz (Xinjiang)

Biology. Flight in the end of July or August, later than P. glaphyra, at 2600-3000 m a.s.l. (Kaingdy-Katta Mt. Range and eastern Terskey Alatau Mts). According to our observations, males flying in the second half of sunny days and in twilight. According to O. Bang-Haas (1927), males fly between 11 a.m. and 2 p.m. Females fly reluctantly, small green eggs laid in batches not fastened to a substrate. Freshly hatched caterpillars almost do not eat, hibernation at instar 1. Food plants: various herbs, including Astragalus, in captivity dandelion (Taraxacum). In the daytime, larvae hiding under stones, mostly on slopes of southern exposition. Living on dry herb-clad slopes, distribution patchy. In many places, a mass species.

Similar species. P. mongolica, has submarginal spots on the hw; the longitudinal stria on the fw is wide.

61. Palearctia (Palearctia) ferghana (Staudinger, 1887)

(Pl. 14, Fig. 4)

Arctia erschoffii ferghana Staudinger, 1887: 82, TL: “Margelan, Alai mont.” [= Alaiskiy Mts].

[ferghana – after Ferghana = Ferghana, Central Asia]

Groum-Grshiäilo, 1890: 533, Arctia erschoffii ferghana
Seitz, 1910: 84, pl. 16, row k, Micrarctia kindermanni ferghana
Strand, 1912: 2, Arctica schottlaenderi
Bang-Haas, O., 1927: 67, Micrarctia kindermanni ferghana
Daniel, 1961: 155, pl. 11, fig. 8, Micrarctia mustangbhoti
Daniel, 1966: 161, pl. 3, figs 4-16, Micrarctia variabilis
Dubatolov, 1996b: 28, Palearctia ferghana
Dubatolov, 1996b: 30, Palearctia ferghana sussamyra
Dubatolov, 1996b: 30, Palearctia ferghana turkestana

Subspecies:

P. f. ferghana (Staudinger, 1887)
P. f. schottlaenderi (Strand, 1912)
P. f. mustangbhoti (Daniel, 1961)
P. f. variabilis (Daniel, 1966)
P. f. sussamyra Dubatolov, 1996b
P. f. turkestana Dubatolov, 1996b.

Description. Superficially, resembling P. glaphyra but differing in an infuscate apex of hw and by details of fw pattern. On fw, dark medial bands not interrupted, otherwise hind angle of fore spot on first median band (M1) sharp (Dubatolov, 1996b).

Variability. This concerns the size of black spots on the hw and the width of white bands on the fw. Differences appear appreciable only based on a number of specimens.

The following subspecies are accepted:
ssp. ferghana – Alaiskiy Mt. Range (“Margelan, Alai mont.”);
ssp. turkestana – Shakhristan Pass, Kum-Bel Pass (Turkestanskiy Mts); background colour white; spots so enlarged that merging into transverse bands; basal part of anal vein on hw pollinated by black scales;
ssp. variabilis – Afghanistan, Hindu Kush, Anjuman Pass; fw pattern highly variable, hw with a wide black margin or fully black;
ssp. sussamyra – Kirghizia, Susamyr Mts, Ala-Bel Pass, 3300 m a.s.l.; main colour purely white, transverse striae merged, hw above vein R yellow, discoidal spot on hw large;
ssp. schottlaenderi – “Thianschagebirge”; main colour of fw pale pink, black spots diffuse, hw carmine red;
ssp. mustangbhoti – Nepal, Mustangbhot, Tange-Khola, 5000 m.

Distribution. Pattern Central Asian.
Within the former Soviet Union. Pamirs-Alai (Alaiskiy and Turkestanskiy Mt. ranges), West Tian-Shan: Sussamyr Valley (Fig. 59).

Fig. 59. Kirghizia, W. Tian-Shan, Susamyr Valley, habitat of Chelis thianshana Dub., Palearctia ferghana sussamyra Dub. and some others (photo by V. S. Murzin).
Beyond the former Soviet Union. Afghanistan (Anjuman Pass), Himalaya.

**Biology.** Moths appearing in the beginning of August, in warm years in mid-July, on dry places and at edges of taluses at 2600-3200 m a.s.l. Caterpillars spending the daytime under stones, where they pupate in loose cocoons. Pupa brown, pollinated bluish.

**Similar species.** All species of the *erschoffi-mongolica* group (see the key).

### 62. *Palearctia (Centrarcitia) mongolica* (Alpheraky, 1888)

*(Pl. 14, Fig. 3; genitalia in Pl. 26, Fig. 7)*

*Arctia mongolica* Alpheraky, 1888: 67, TL: “Djoungor, dans la province Ordos”.

[= *serarum* Grum-Grshimaïlo, 1899; *serum* Grum-Grshimaïlo, 1902]

[mongolica – in honour of a prince of the Mongolian nomads in Chinese Djoungor (Dzhuungar) – (Lat.)]

Alpheraky, 1892: 13, pl. I, fig. 6, *Arctia mongolica*

Seitz, 1910: 84, pl. 16, row k, *Micrarctia kindermannii mongolica*

Dubatolov, 1990d: 157, *Centrarctia mongolica*

Dubatolov, 1996a: 10, *Centrarctia mongolica*

**Note.** Dubatolov (1990f) has erected the subgenus *Centrarctia* as based on the differences in male genitalic structure of *Palearctia mongolica* and other congeners. In our opinion, however, the differences are too small to separate *P. mongolica* into a genus-group category. Still Dubatolov’s (1990f) classification is retained for the sake of completeness.

The species was described upon material taken during G. Potanin’s expedition in 1883-1884, nowadays included in the Red Data Book of the Russian Federation (Danilov-Danilian, 2001).

**Description.** Male: alar expanse 31-34 mm. Main colour of wing black, with a network of white striae. White pattern on fw with pink tint, consisting of a white X-shaped pattern in external part of fw and two transverse striae running from costal edge up to a white longitudinal stria, sometimes reaching the hind edge. The white longitudinal stria arising at base of fw and running to external edge along vein A1. Hw pink red, with large submarginal spots and a prolate spot, latter running from costal edge to discoidal vein.

**Variability.** Width of white striae on fw, and size and shape of spots on hw varied.

**Distribution.** Pattern Chinese-Mongolian.

Within the former Soviet Union. Tuva (Ubsu Nor).

Beyond the former Soviet Union. Mongolia (Gobi, Altai etc.), China (Ordos Plateau, Nei Mongolia).

**Biology.** Flight in July in dry places. In the mountains reaching 3300 m a.s.l. Larvae feeding on *Artemisia* spp. and other herbaceous plants.

**Similar species.** *P. erschoffi*, has no submarginal spots on the hw, and only a narrow stria at the apex. The longitudinal stria on the fw is narrow.

### 63. *Palearctia (Palearctia) sarycola* de Freina, 1997

*(Pl. 14, Fig. 6; Fig. 61)*


[sarycola – dweller of Sarykolskiy Mt. Range, East Pamirs (Lat.)]

**Description.** Male. Pattern of fw usual in the *glaphyra*-group. Fw prolate, narrow, yellow brownish (ochre). Spots brown-black, very clear, doubled subapical spot black, strongly expressed. External edge of fw yellowish. Hw creamy white, sharply contrasting to fw; veins darkened, discal spot point-like; a wide costal band interrupted on vein Cu1 up to edge of wing. Antennae peetinate. Head and thorax covered with long yellow ochre hairs. Patagia very bright, yellowish. Abdomen black with ochre yellow segments, tegula acyanotic brown, bordered ochre yellow.
Variability. Only two specimens available.

Distribution. Pattern Central Asian.

Within the former Soviet Union. East Pamirs (Sarykolskiy Mt. Range, Fig. 61) and Beik Pass.
Beyond the former Soviet Union. West China (eastern slopes of Sarykolskiy Mts).

Biology. Flight at 4100-4700 m a.s.l. in the end of July. Caterpillar hibernating.

Similar species. Slightly resembling *P. golbecki*.

30. Genus *Sibirarctia* Dubatolov, 1987


The genus is distinguished by a number of peculiarities separating it from *Tancrea* and *Palearctia*: eye with ciliae, valve of males with three processes, fore epiphysis well-developed, bulla present etc. Based on genitalic conformation, the species of *Sibirarctia* are close to *Chelis* Rambur.

“Palpi very short. Head beset with hairs, antennae of male and female two-combed but crests of female shorter. Eye with rather sparse ciliae. Fore tibiae twice as short as femora, with a long epiphysis, middle tibiae with one pair, hind with two pairs, of short calariae.

Genitalia of males: uncus narrow, slightly curved, valve almost rhomboidal with three processes at external edge, juxta almost exactly hexangular, with spikes at edges. Aedaeagus curved, with spikes at apex” (Dubatolov, 1987a: 39).

Key to species of *Sibirarctia*:
1. On underside, basal part of hw light. ........................................................................................................ *S. buractica*
– On underside, basal part of hw with black spots. ...................................................................................... *S. kindermanni*
98  VLADIMIR MURZIN

64. Sibirarctia kindermanni (Staudinger, 1867)

(Pl. 14, Fig. 7; Fig. 64; genitalia in Pl. 26, Fig. 8)

*Arctia kindermanni* Staudinger, 1867: 102, TL: (?) Ural [“probably the Orenburg Gouvernement” (O. Bang-Haas, 1927)].

[= *kindermanni roseni* O. Bang-Haas, 1927; *kindermanni ussuriensis* O. Bang-Haas, 1927]

[kindermanni – named in honour of German entomologist E. Kindermann (Lat.)]

Staudinger, 1887b: 192-193, pl. 11, fig. 4, *Arctia pretiosa*
Staudinger, 1897: 326, pl. 9, fig. 23, *Arctia kindermanni pomona*
Rothschild, 1910: 83, *Ocnogyna pretiosa albovittata*
Spuler, 1910: 138, pl. 76, fig. 12, *Arctia kindermanni*
Seitz, 1910: 78, pl. 14, row e, *Micrarctia kindermanni pretiosa*
Bang-Haas, O., 1927: 65, pl. 8, fig. 40, *Micrarctia kindermanni*
Fang, 2000: 340, pl. 6, fig. 5, *Sibirarctia kindermanni*

Subspecies:

*S. k. kindermanni* (Staudinger, 1867)
*S. k. pretiosa* (Staudinger, 1887)
*S. k. pomona* (Staudinger, 1897) [= *roseni* (O. Bang-Haas, 1927)]
*S. k. chinensis* (Grum-Grushimaïlo, 1899)
*S. k. albovittata* (Rothschild, 1910).

Description (based on a specimen from Primorye (Pl. 14, Fig. 7; ssp. *pretiosa* (Staudinger, 1887)). Alar expanse 30 mm. Fw of male black with a white pattern consisting of two transverse striae, neither reaching the inner edge, and
an X-shaped pattern in external part of wing. A thin longitudinal stria (Ls, Fig. 9) passing from base of wing till third light stria. Hw yellow, with a black basal field and a wide black border. A crescent spot on discoidal vein. Colour of wing and pattern on underside same as from above. Head, thorax and abdomen from above black. Underside collar, forehead (epicranium) and thoracic segments yellow.

**Variability.** Considerable.

Within the territory of the former Soviet Union, the following subspecies are known:

ssp. *kindermanni* – southern Urals up to Yenisey River; a very wide light pattern on fw, basal part of hw considerably darkened (Fig. 63);

ssp. *pretiosa* – Middle Amurland (Raddevka), Primorye (Ussuriysk, Sikhote-Alin); China (Heilongjiang); according to Seitz (1913), female smaller, with a more strongly developed light pattern, boundary belt on hw divided into separate spots.

Illustrations of this subspecies in Seitz (1910) and O. Bang-Haas (1927) (type!) are completely different. Specimens from Amur (Raddevka) (Pl. 14, Fig. 7) appear to be much closer to Seitz’s than to the type as depicted by O. Bang-Haas;

ssp. *pomona* – southern slopes of Yablonovyi Mt. Range, southern Transbaikalia (locus typicus), southern coast of Lake Baikal; Transbaikalia; Upper Amurland; Mongolia. Hw yellow, white pattern on fw significantly narrower than in the nominotypical form, but more strongly developed than in the ssp. *pretiosa*. Black boundary belt divided into two separate wide spots (as in the typical form). Basal part of hw with a small darkening (O. Bang-Haas, 1927, type!).

From China, the following forms have been described:

ssp. (?) *chinensis* (Grum-Grushima, 1899: 462) (*Ocnoyyna latrillei chinensis*) – Khingan Mts, China;

ssp. (?) *albocitata* (Rothschild, 1910: 83) (*Ocnoyyna pretiosa albocitata*) – Qinhai.

The status of these two subspecies is questioned.

**Distribution.** Pattern Siberian-Chinese.

Within the former Soviet Union. Southern Urals; south half of West Siberia (Omsk, Novosibirsk, Krasnoyarsk); Altai; southern coast of Lake Baikal, Transbaikalia; Middle Amurland; Primorye.
Beyond the former Soviet Union. Northern and central Mongolia; China: Khingan, Qinhai, Xinjiang, Liaonin, Shaanxi, Nei Mongolia, Heilongjiang (Dubatolov, 1996b), Liaonin.

**Biology.** Flight in July, in various habitats like leafed and coniferous forests, on slopes of hills and in the mountains.

**Similar species.** *S. buraetica*: fw with a reticulate pattern consisting of thin striae.

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**65. Sibirarctia buraetica** (O. Bang-Haas, 1927)

(Pl. 14, Figs 8-9)

*Micrarctia buraetica* O. Bang-Haas, 1927: 64, pl. 8, figs 35-36, TL: Tannuola Mt. Range (Shavir, Tuva Republic).

[ = *Micrarctia buraetica echesi* O. Bang-Haas, 1927]

[buraetica – after the Buryat people, Siberia (Lat.)]

Bang-Haas, O., 1927: 64, pl. 8, fig. 37, *Micrarctia buraetica validus*

Dubatolov, 1996b: 58, 71, fig. 2j, *Sibirarctia buraetica chajataensis*

Subspecies:

*S. b. validus* (recte: *valida*) O. Bang-Haas, 1927

*S. b. chajataensis* Dubatolov, 1996b.

**Description** (based on specimens from Yakutia). Alar expanse 27 mm. Fw almost black, with a thin white pattern consisting of longitudinal (on veins) and transverse striae. Fringe of fw white. Hw yellow with several black spots at edge and with a large discal spot. Fringe yellow. Abdomen yellow with black transverse striae. Thorax black with yellow longitudinal striae.

**Variability.** Several geographically stable forms have been described:

ssp. *buraetica* – Tuva, Transbaikalia, central Yakutia, Altai, East Sayan; northern Mongolia;

ssp. *valida* – southwestern Transbaikalia (Kyakhta District in Buryatia) (Dubatolov, 1996b);

ssp. *chajataensis* – mountains of eastern Yakutia (Suntar-Khayata Mt. Range, Oimyakon).

We only have material from Mongolia and Yakutia. These are shown on Pl. 14, Figs 8-9.

**Distribution.** Pattern South and East Siberian.

Within the former Soviet Union. Southeastern part of Altai; Tuva; East Sayan Mts; Baikal; Transbaikalia; central and eastern Yakutia.

Beyond the former Soviet Union. Northern and central Mongolia.

**Biology.** Flight in the end of June to July in the taiga, in low woody mountains.

**Similar species.** *S. kindermanni*, differs by the black fw with a smaller number of light striae.
31. Genus *Chelis* Rambür, 1866

*Chelis* Rambür, 1866: 256, TS: *Phalaena maculosa* Gerning, 1780.

= *Cletis* Kirby, 1892: 263
Seitz, 1910: 43, *Cletis*
de Freina, 1984: 209, *Chelis*
Toulgoet, 1985: 69, *Chelis*
Dubatolov, 1988: 80, *Chelis*

Fw usually light with angular black spots, hw pink with median and boundary maculae. Eyes large, coated with rather sparse and very small hairs. Antennae of male and female combed, in female crests short. Proboscis abortive. Fore tibiae with a large epiphysis, middle tibiae with one pair of calariae, hind with two.

Species of this genus are distributed in Europe and northern Asia. Revisions were carried out by de Freina & Witt (1984) and Dubatolov (1988).

There is certain ambiguity as regards the species composition of this genus. The use of structural features of the adult only seems to fail to reveal specific or subspecific independence of the various forms. More detailed information on sympatry or allopatry, the biology, pre-imaginal stages is necessary. In general, we follow Dubatolov (1988), with the following species accepted: *Ch. maculosa* (Gerning, 1780) (ssp. *maculosa* and ssp. *mannerheimi* (Duponchel, 1836)), *Ch. reticulata* (Christoph, 1887) (ssp. *reticulata* and ssp. *transcaucasica* Dubatolov, 1988), *Ch. fergana* Dubatolov, 1988, *Ch. tianshana* Dubatolov, 1988, *Ch. dahurica* (Boisduval, 1832) and *Ch. caecilia* (Kindermann, 1853).

Superficially, several congeners are very similar and their exact identification requires preparation of the male genital apparatus. A key to species based on genitalic conformation is given by Dubatolov (1988). We rather stick to external characters.

Key to species or subspecies of *Chelis* (Fig. 64):
1. Black spots at external edge of fw either absent or there is one small spot near apex. ........ *Ch. maculosa maculosa* –. External edge of fw with two or more black spots. ........................................................................................................ 2
2. On hw, light colours (red, pink or yellowish) dominating. A black pattern covering less than half of wing. ........ 3

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Fig. 64. Diversity of patterns in *Chelis*. (1) *Ch. maculosa* (Gern.). Black spots at external edge of fw missing; (2) *Ch. maculosa mannerheimi* (Dup.). Black marginal spots present; (3) *Ch. reticulata* (Chr.). Black marginal spots cut by thin lines; (4) *Ch. dahurica* (Bsd.). Black marginal spots cut by thick lines (photo by V. S. Murzin).
– On hw, black dominating. ................................................................. Ch. caecilia
3. External edge of fw with two separate, triangular, black maculae not divided by light pollination on veins. .......... ................................................................. Ch. maculosa mannerheimi
– Black maculae at external edge of fw intersected along veins by very thin light lines. ........................................ 4
4. Triangular spots on veins M2 and Cu1 at external edge of fw divided by very thin light veins. Fw creamy. .......... ................................................................. Ch. reticulata
– Marginal spots intersected along veins by wide light striae ................................................................. Ch. ferghana
5. A narrow black spot prolate in longitudinal direction in the middle of wing below cubital vein and vein Cu2. ........ ................................................................. Ch. dahurica
– Middle of wing without such a spot. ................................................................. Ch. tianshana

66. Chelis maculosa (Gerning, 1780)

(Pl. 14, Figs 10-12)

Phalaena maculosa Gerning, 1780: 862, pl. 2, figs 1–3, TL: Vienna, Austria.


[maculosa – spotty (Lat.)]
[Felsheiden-Fleckenbär, Schwarzgefleckter Bär – (Germ.)]
[Ecaille Tachetée – (Fr.)]

Duponchel, 1836: 49, pl. 4, fig. 2, Chelonia mannerheimi
Staudinger, 1894: 256, Arctia maculosa arragonensis

Fig. 65. Chelis maculosa mannerheimi (Dup.), ♂. Kazakhstan, Aktyubinsk Region, 26 km W of Novoalekseevka, 50°10’N, 55°18’E, 225 m, 6.VI.1998 (photo by O. G. Gorbunov).
Seitz, 1910: 78, _Chelis maculosa_
Dubatolov, 1988: 80, _Chelis maculosa_
Fang, 2000: 344, pl. 6, fig. 9, _Chelis maculosa mannergeimer [sic!]_ (misspelling)

Subspecies:
- _Ch. m. mannerheimi_ (Duponchel, 1836) (Fig. 65) [= _Ch. m. sličnoensis_ (Rebel, 1903)]
- _Ch. m. honesta_ (Freyer, 1843)
- _Ch. m. latina_ Turati, 1909.

**Description** (based on specimens from Austria). Alar expanse of male 28-31 mm, of female 24-26 mm. Fw, including costal edge, fulvous gray with neat, black, triangular spots. No boundary series of spots expressed. Hw from above dirty pink with three large, rounded, submarginal spots; small spots on discoidal vein and at base closer to inner edge. Pattern brighter and more contrasting in female than in male. Costal vein on fw darkened. Antenna with short teeth. Underside dark pink.

**Variability.** Noticeably varying in size of spots and coloration.

The following geographically isolated taxa are well discernible:
- ssp. _maculosa_ – Middle and southern Europe: Crimea, southern European Russia, lower flow region of Kama River, southern Urals, southwestern Siberia, Western Europe;
- ssp. _mannerheimi_ – eastern part of the distribution range of the species: Don River region, Lower Volga region, southwestern Siberia, northern Kazakhstan, northern China; described from “the Kyrgyz steppes” as an independent species; a little larger than the typical form, fw often lighter, creamy with well-marked submarginal series of spots;
- ssp. _sličnoensis_ – Bosnia, very similar to the ssp. _mannerheimi_;
- ssp. _honesta_ – Romania;
- ssp. _latina_ – Sicily, Italy.

The two latter forms, as well as _sultana_ Schwingenschuss, 1937 and _schwingenschussi_ Daniel, 1961, have been referred by Toulgoet (1985) to the ssp. _mannerheimi_; ab. _flava_ Spuler, 1910 – a form of infrasubspecies rank with yellow, not red, hws.

**Distribution.** Pattern Euro-Siberian.

Within the former Soviet Union. European part of Russia: Don and Volga rivers, in the north up to lower Kama River region, southern Urals, Orenburg, Millerovo, Ryazan, Orel; West Siberia (Kurgan, Omsk, Karasuk); Ukraine; Crimea.

Beyond the former Soviet Union. Europe: Spain, France, southern Germany, Austria, Hungary, southern Poland, Czech Republic, Slovakia, Bulgaria (Buresch & Tuleschkow, 1943), Macedonia, Greece, European Turkey; (?)China (Xinjiang).

**Biology.** Associated with limestone (Koch, 1984). Flight from mid-June to the end of July.

Larva black with a reddish dorsal strip and oblique strokes on lateral sides. Warts black with fascicles of dark gray hairs on dorsal side and with red hairs on lateral sides. Head black. Caterpillars living on _Galium_, _Achillea_ and other herbs from August till June, hibernating. Pupation in a loose cocoon on the ground or under stones.

**Note.** Toulgoet’s (1985) treatment of this species seems to be imperfect. In particular, the attribution of several oriental forms like _dahurica_, _caecilia_, _reticulata_ and some others to the ssp. _mannerheimi_ seems incorrect.

**Similar species.** _Ch. dahurica_ (Boisduval), _Ch. tianshana_ Dubatolov, _Ch. ferghana_ Dubatolov (see key).

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67. _Chelis reticulata_ (Christoph, 1887)

(Pl. 14, Figs 13-14)

_Arctia maculosa reticulata_ Christoph, 1887a: 163, TL: Nukhur, W. Kopetdagh.

[reticulum – web (Lat.)]

Daniel, 1933: 103, _Chelis maculosa schwingenschussi_
Schwingenschuss, 1937: 59, _Chelis maculosa sultana_
Dubatolov, 1988: 92, fig. 2d, _Chelis reticulata transcaucasica_
Subspecies:
C. r. schwingenschussi Daniel, 1933
C. r. sultana Schwingenschuss, 1938

Description. Alar expanse 31-35 mm. Fw creamy or creamy gray with a black pattern of spots. Marginal series of spots including two rather large spots triangular or oval in form, one at apex and the second in the middle of external edge. Last spot cut by thin light strips on veins. Hw yellowish, often with pink spots at base and in the centre of wing. Submarginal series of rounded spots on hw quite well-developed while series M2 usually not expressed. Spot on transverse vein narrow, as a rule. Antenna double-combed, in male with long crests, in female with shorter ones but still these 2 times longer than their segment thick.

Variability. Individual variability is marked in colour variation and the degree of development of hw pattern, i.e. belt M2 sometimes visible, median spot on hw enlarged, pink tint on hw reduced.

The following subspecies are known:
ssp. schwingenschussi – Asia Minor;
ssp. sultana – with bright pink hws, described from the Anthurus Mt. Range, Turkey;
ssp. transcaucasica – differing by a well-developed stria M2 while boundary spots on fw weakly divided on veins (Dubatolov, 1988). However, as the rich topotypic material available to us, from Aragats Mt., Armenia, proves to contain numerous specimens identical to the nominotypical form, this subspecies is questionable.


Within the former Soviet Union. Caucasus, Transcaucasia, W. Turkmenistan (Kopetdagh, Greater Balkhan); Beyond the former Soviet Union. Northern Iran, Turkey.

Biology. Flight in the end of June and in July at 1400-2000 m a.s.l. Often flying to light.

Similar species. Ch. maculosa mannerheimi, smaller, light veins not dividing the marginal spots. Both Ch. maculosa mannerheimi and Ch. reticulata occur sympatrically in the northern Caucasus.

68. Chelis caecilia (Kindermann, 1853)
(Fig. 66)


[= insularia Kozhantchikov, 1924]

caecilia – a female name (Lat.)

Lederer, 1855a: 97-121. Arctia maculosa caecilia
Seitz, 1910: 78, pl. 14, row g; pl. 16, row a, Cletis maculosa caecilia
Spuler, 1910: 137, Arctia mannerheimi caecilia
Koshantschikov, 1924: 69, Cletis maculosa insularia
Dubatolov, 1988: 80, Chelis insularia
Dubatolov, 1994: 16, Chelis caecilia
Dubatolov, 1996b: 56, Chelis caecilia

Description. Alar expanse 34 mm. Fw yellow-gray with black spots. Marginal pattern of fw consisting of two large triangular spots not divided by light veins. As remaining black spots large, general coloration of wing dark. Hw coloration from red to gray with black boundary and submarginal maculae merged due to radial bands, latter running from base of wing to external edge. Median spot well-developed. Abdomen with a black dorsal stria, thorax yellow with three longitudinal striae, collar yellow.

Variability is displayed in width of the light pattern on the fw and in size of the dark spots on the hw. It also concerns hw coloration.

Distribution. Pattern South Siberian.

Within the former Soviet Union. Altai Mts; Khakassia; Kuznetskiy Alatau Mts (Fig. 62), western Buryatia; northeastern Kazakhstan.
Beyond the former Soviet Union, Mongolia.

**Biology.** Flight in June at 1200-2000 m a.s.l. In the Altai, the species occurs on felling grounds, in sparse taiga stands and also on talus with thin vegetation.

**Note.** Spuler (1910) erroneously considered *Ch. caecilia* as *Arctia mannerheimi* var. *caecilia* and recorded this variety in Bulgaria and Armenia. Seitz (1910) considered *Ch. caecilia* as a small form of *Ch. maculosa* distributed from Asia Minor to the Altai, with transitional forms already found in Eastern Europe. One of such “transitional” forms showing the black spots on the FWS so greatly enlarged that they often merge at the edge is *slivnoënsis* Rebel, described from Bosnia. Draudt (1931) omitted *Ch. caecilia* altogether. The same concerns Dubatolov’s (1988) revision of *Chelis* and his faunitic list of the mountains of southern Siberia (Dubatolov, 1990). In contrast, later (Dubatolov, 1994, 1996), *Ch. caecilia* has been resurrected to full species known from “East Kazakhstan”, Buryatia, Khakassia and Mongolia.

**Similar species.** *Ch. dahurica*, differs by bright FWS with a smaller number of black spots.
69. *Chelis dahurica* (Boisduval, 1832)

(Pl. 14, Fig. 15; Pl. 15, Figs 1–3; Figs 68, 69; genitalia in Pl. 26, Fig. 9)

*Chelonia dahurica* Boisduval, 1832: 126, pl. 60, fig. 1, TL: Altai (?) (Dubatolov, 1988), Turkestan (Fang, 2000).

[= *gruneri* Staudinger, 1867; *maculosa sojota* Tschetwerikov, 1904].

[dahurica – from Dahuria, a historical and geographical region covering the basins of Shilka, Argun, Zeya, Bureya and some other rivers in Transbaikalia] (Lat.)

Tschetwerikov, 1904: 77-79, *Cletis maculosa sojota*

Seitz, 1910: 78, pl. 14 row f, *Cletis maculosa dahurica*

Dubatolov, 1988: 94, *Chelis dahurica*

Dubatolov, 1996: 59, *Chelis dahurica*

Fang, 2000: 345, pl. 6, fig. 10, *Chelis dahurica*

**Description.** Alar expanse 35-37 mm. Fw from creamy to dark gray. Black spots prolate in longitudinal direction, this providing an arrow-like appearance. In particular, such a spot filling the central cell. All veins clearly brightened. Besides, often there is a transverse stria in discoidal cell, Ls stria above anal vein, and a white X-shaped pattern in external half of wing. Hw of male pink, of female brighter. Spots of subbasal row often merged with each other into a transverse belt adjacent to median spot. Spots of submarginal row rounded, rather large, sometimes merged. Fw of female narrower, abdomen large and thick.

**Variability.** The following infrasubspecies are known:

* f. *sojota* Tschetwerikov, 1904. Described as a subspecies of *Ch. maculosa*, from Irbek River, Siberia. This form distributed “south of Sayan Mountains, Minusinsk” (Tschetwerikov, 1904) is very similar to *Ch. dahurica* but shows much darker chestnut coloured fws. As a similar kind of moth occurs in the Altai among the usual *Ch. dahurica*, we probably face an infrasubspecific form;

* f. *gruneri* (Staudinger, 1867). Described as a distinct species from Ust-Kamenogorsk, southwestern Altai. Alar expanse 37 mm. Fw very light, creamy in colour, with small black maculae disposed along cells of fw in the form of

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**Fig. 68. Chelis dahurica** (Bsd.). ♀. Russia, Altai Mts., Ukok Table-land, 49°15’ N, 88°05’ E, 2800 m, 6.VIII.1990 (photo by V. S. Murzin).
narrow longitudinal striae; hw pink with black spots bordered yellow; body light, thorax with a black triangular spot in the middle and with black patagia, abdomen with a black dorsal series of points;

*Ch. keniği* forma nova, Kuraysky Mts (Chagan-Uzun) at 2000 m a.s.l., 10 VII.1997 (Fig. 69). 1 specimen, ♂.

Alar expanse 32 mm. Fw light brown with several rather small black maculae. Series of cuneiform spots along external edge of fw. A black stria running from base of fw along costal vein (such a stria missing in *Ch. d. dahurica*). Black spots on fw edged pale. Hw red with black boundary spots (like in *Ch. d. dahurica*). A light vein traversing a small discal spot.

**Distribution.** Pattern South Siberian.

Within the former Soviet Union. South Urals; Siberia: Kurgan and Omsk regions; Novosibirsk, Karasuk, Barnaul; mountains of South Siberia: Altai, Khakassia, Tuva, Sayan Mts; Irkutsk, Transbaikalia, Kazakhstan: Saur, Tarbagatay Mts. Beyond the former Soviet Union. Northern and central Mongolia; China: Xinjiang.

**Biology.** More common in the mountains up to 2000 m a.s.l., yet also found over plains in the forested steppe from the Altai and Novosibirsk region to Shadrinsk, Kurgan Region. Flight in July.

**Similar species.** *Ch. maculosa mannerheimi*, dark triangular spot at fw apex not traversed by light veins, median spot on hw small. *Ch. caecilia*, strongly developed black spots on hw merged due to radial striae.

### 70. Chelis ferghana Dubatolov, 1988

(Pl. 15, Fig. 4; genitalia in Pl. 26, Fig. 10: 1)

*Chelis ferghana* Dubatolov, 1988: 92, figs 1n, 2e, TL: Padsha-Ata River (Chatkalskiy Mt. Range, north of Namangan).

**Description.** Alar expanse 33-36 mm. Fw straw with numerous black maculae. Marginal series of spots consisting of separate cuneiform maculae divided by light veins.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Chatkalskiy and Talasskiy Mt. ranges, Toktogul. Beyond the former Soviet Union. Unknown.

**Biology.** Flight in the end of June in light deciduous and mixed woods at about 1500 m a.s.l.

**Similar species.** *Ch. maculosa mannerheimi*, *Ch. dahurica*, differ reliably by male genitalic structure only. *Ch. caecilia*, hw with a predominantly dark pattern.

### 71. Chelis tianshana Dubatolov, 1988

(Genitalia in Pl. 26, Fig. 10: 2)

*Chelis tianshana* Dubatolov, 1988: 93, figs 1k, 2g, TL: Uzun-Gyr (Kyrgyzskyi Mt. Range).

[tianshana – after Tian-Shan Mts (Lat.)]
**Description** (based on paratypes). Alar expanse 36–38 mm. Fw light with large black spots. Several cuneiform spots at external edge of fw, these traversed by light veins. Remaining black pattern expressed completely, but general coloration of wings light due to spots edged by wide light fields. Discoidal spot rectangular but broken into three parts by discoidal vein. Hw pinkish red. Submarginal belt consisting of large maculae. Discoidal spot well-developed. Median belt (M2) running from costal edge to vein A3. Underside pink with a dark pattern concurring with upper side pattern. **Variability.** Development of a black pattern is varied. **Distribution.** Pattern Central Asian. Within the former Soviet Union. Central and East Tian-Shan (Kirghizskiy Mts, Susamyr Valley, Terskey Alatau, Zailiiskiy and Dzungarskiy Alatau, Naryn), Tarbagatay Mt. Range. Beyond the former Soviet Union. China (Xinjiang: East Tian-Shan).

**Biology.** Flight in July on open places with bushes, on mountain slopes overgrown with taluses. **Similar species.** *Ch. fergana*, lighter with developed light striae, like *Ch. dahurica* differs by genitalic conformation.

### 32. Genus Grammia Rambür, 1866


= *Orodennias* Wallengren, 1885: 315, TS: *Bombyx quenseli* Paykull, 1793

= *Callactria* auct., non Packard, 1864

= *Holactria* Smith, 1938: 6, TS: *Arctia turbans* Christoph, 1892

Antennae of male bipectinate, of female simple, slightly dentate. Proboscis short, rolled into a spiral. Palps thin, coated with long hairs. Hind tibiae with two pairs, middle with one pair, of calariae. Fore tibiae 2 times shorter than femur.

Male genitalia: tegumen shorter than uncus, juxta ventrally nearly crescent in form, aedaeagus short and thick. In North America, more than 20 congeners are known.

**Key to our species or subspecies of Grammia:**

1. Hw yellow. ................................................................. 2
   – Hw red. ........................................................................... *G. philippiana olga*

2. Basal part of hw yellow. .................................................. *G. turbans*
   – Basal part of hw dark. ...................................................... *G. quenseli*

### 72. Grammia quenseli (Paykull, 1793)

*(Pl. 15, Figs 7-8; genitalia in Pl. 26, Fig. 11)*


[= *strigosa* Fabricius, 1794; *quenseli* v. *fallout* Jourdhenuil, 1866; *gelida* Schöyen, 1880, (preoccupied by Moschler, 1848); *quenseli* var. *norvegica* Strand, 1919 (replacement name for *gelida* Schöyen, 1880); *daisetsuzana* Matsumura, 1927: 110, 113]

[quenseli – in honour of Swedish entomologist Conrad Quensel]

[Écaillé Radiante – (Fr.)]

Ménétriés, 1859b: 500, *Chelonia quenseli liturata*  
Spuler, 1910: 139, pl. 73, fig. 27, *Arctia quenseli*  
Seitz, 1910, 82, pl. 16, row g, *Orodennias quenseli*  
Esaki et al., 1971: 209, pl.121, fig.2561, *Orodennias quenseli daisetsuzana*

**Subspecies:**

*G. q. liturata* (Ménétriés, 1859) [= *G. q. daisetsuzana* (Matsumura, 1927)].
**Description.** Alar expanse 35-37 mm. Fw black with contrastingly yellow veins. Yellow pollination on vein Cu2 especially expanded. A yellow transverse stria or point at apex of cell. A zigzag transverse stria along external edge of wing. Hw of male uniform dark gray. Hw of female with a yellow field forming a marginal stria with irregular edges. Thorax black with yellowish striae and patagia, latter surrounded by yellow. Abdomen yellow with a black stria from above and with spots on each lateral side.

**Variability.** Width of yellow striae on veins varied.

Several subspecies are known:
- ssp. *quenseli* – distributed in the polar parts of Europe and Asia;

**Distribution.** Pattern circumpolar. Widely but locally spread in Europe, Asia and America.

Within the former Soviet Union. Khibines, Polar Urals, Altai, Tuva, East Sayan, Transbaikalia, Yakutia, Magadan Region, Kamchatka, Wrangel Island; Saur Mts, southeastern Kazakhstan.

Beyond the former Soviet Union. Europe (Alps, Carpathians, polar regions of Scandinavia); northern Mongolia; Hokkaido Island, Japan; Xinjiang, Hebei, Heilongjiang, China; polar regions and mountains of North America.

**Biology.** Flight in June-July, in the south in the mountains on rather humid slopes, in near-polar regions in the tundra. Caterpillar black; a light stria consisting of points and strips running along body. Blackish fibrous warts on segments 4 to 12. Reddish spiracles on each lateral side of body. Hairs on fore segments short, on hind segments elongated, reddish brown.

Larvae occurring since July until spring, hibernating, living on various herbaceous plants: *Lathyrus*, *Geum*, *Plantago*, *Taraxacum*, *Gentiana*. In the daytime larvae hiding under stones. Pupa brown with bluish pollination, in a loose cocoon under stones, perhaps sometimes hibernating.

**Similar species.** *G. philippiana olga*, differs by red hws with a black pattern; *G. turbans* (Christoph), has yellow hws with black spots.

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**73. Grammia philippiana Ferguson, 1985**

(Fig. 70)


[olga – in honour of Olga Khruleva, the collector]

**Description.** Male (based on paratype). Alar expanse 35 mm. Fw black with contrasting white veins. White pollination on vein Cu2 especially wide. Light transverse stria or point at apex of cell absent. A zigzag, pale, transverse stria passing along external edge of wing. Hw of male uniformly dark gray with a pink undulate fascia close to external edge. Underside pattern the same. Eyes small, oval, strongly convex, without ciliae. Antennae short, about half as long as costal edge, bipectinate, black. Tibiae from above white, their underside black. Hind tibiae gradually enlarged toward apex. Thorax and abdomen black.

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**Fig. 70. Grammia philippiana ssp. olga Dubatolov.** *♂* paratype (left). Wrangel Island, between Roger and Somnitelnaya bays, 21 VII 1960, leg. A. Veljjanin. *♀* (right). Wrangel Island, lower reaches of Gusinaya River, 14 VII 1984, leg. O. Khruleva (ZMUM).
Female. Alar expanse 34-35 mm. Pattern like in male but more contrasting while pollination on veins yellowish. Thorax yellowish with a central black line. Patagia edged yellow. Hw red with black radial striae running from base of wing, with irregular edges. Abdomen yellow with a black stria from above and with spots on each lateral side.

**Distribution.** Pattern Polar American.
Within the former Soviet Union. Wrangel Island.
Beyond the former Soviet Union. Polar regions of North America, Alaska.

**Biology.** Flight from mid-July to early August.

**Similar species.** *G. quenseli*, has the hw yellow or black, not red; light longitudinal stria at the apex of central cell of fw absent; costal process of valve longer, narrow at base, not narrowed toward apex.

### 74. Grammia turbans (Christoph, 1892)

(Pl. 15, Figs 10-11)

*Arctia turbans* Christoph, 1892: 460, TL: Tunga-Alpen, SW of Irkutsk.

[turba – disorder, confusion (Lat.)]

Seitz, 1910: 88, pl. 16, row g, *Orodemnas turbans*

Dubatolov, 1996b: 60, *Grammia turbans*

**Description.** Alar expanse 35-37 mm. Fw black with contrastingly yellow veins. Yellow pollination on vein Cu2 especially expanded. Apex of discoidal cell with a yellow longitudinal stria. A zigzag transverse stria along external edge. Hw of male yellow with a black boundary band, with four black submarginal spots and a large discal spot. Pattern of underside almost the same as from above, but submarginal spots on hw divided by yellow veins. Legs black with yellow tibiae. Forehead (epicranium) yellow. Thorax black with patagia edged yellow. Abdomen from upper side black; on lateral sides with yellow striae. Underside with segments edged yellow. Female with a dark basal part of hw.

**Distribution.** Siberian–West Nearctic.
Within the former Soviet Union. Khakassia, East Sayan, southern Baikal region, Transbaikalia, Middle Amurland, central Yakutia.
Beyond the former Soviet Union. Mongolia, Alaska, NW Canada (Alberta, Saskatchewan, Manitoba).

**Biology.** Flight from the end of July and in August in various habitats like taiga, burned forests, grassy mountain slopes and forest glades. Caterpillar hibernating. In Transbaikalia, a mass species in the second half of summer (Dubatolov, 1985b).

**Note.** Smith (1938) referred this species to the subgenus *Holactia* with the type species *Arctia turbans* Christoph.

**Similar species.** *G. quenseli*, hw almost completely infuscate.

### 33. Genus Hyperborea Grum-Grshimaïlo, 1899


Slender moths with a small head, short palpi and simple antennae. Fw widely triangular, hw rounded. A single species involved.

### 75. Hyperborea czekanowskii Grum-Grshimaïlo, 1899

(Pl. 15, Figs 13-14)


[czekanowskii – in honour of A. L. Czekanowski (1832-1876), a famous explorer of eastern Siberia]

Seitz, 1910: 103, pl.18, row h, *Hyperborea czekanowskii*

Strand, 1919: 107, *Hyperborea czekanowskii*
**Description.** Alar expanse of male 32-34 mm, of female about 25-27 mm. Male wing wide, length ratio of costal edge to external edge about 1.5. Fw dark gray, semi-transparent, with diffuse white pollination on veins and with a dentate stria along edge of fw. Hw white, with vague dark spots at edge and with 2-3 submarginal maculae. Female with narrow and short fws.

**Variability.** Insignificant.

**Distribution.** Pattern circumpolar. Within the former Soviet Union. Polar and boreal regions north of 65°N, from the lower flow of Tunguska River to Chukotka and Wrangel Island as well as northern Kamchatka. This species has also been recorded in the Kodar Mt. Range, southern Transbaikalia (Kostjuk & Golovushkin, 1994).

Beyond the former Soviet Union. Alaska.

**Biology.** Flight in the tundra in July.

**Similar species.** No similar species seem to occur in our fauna.

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**34. Genus Diacrisia Hübner, 1819**


= *Euthemonia* Stephens, 1828: 55 (key), 68, TS: *Phalaena russula* Linnaeus, 1758

= *Elpis* Dyar, 1893 (preoccupied by *Elpis* Mulsant, 1850 (Coleoptera)), TS: *Antarctia rubra* Neumoegen, 1884

Dubatolov, 1985a, b, *Diacrisia*

A genus very close to *Parasemia* Hübner, 1820, but differing by lack of an accessory cell on fw. Veins R2-R5 on a common pedicle. Antennae of male double saw-toothed, of female simple with erect scales and hairs. Wing pattern of Type II A, fw monochromous, with a separated spot. Male genitalia: juxta nearly rectangular, with a membranous area in its median portion in ventral view, spinules absent.

Most species of this large genus are tropical.

Gaede (1930) and some other authors proposed to use the name *Spilosoma* Stephens, 1827 for Palaeartic moths as well. Indeed, superficially some African *Diacrisia* like *D. sublutea* (Bartel, 1903), *D. scortilla* (Wallengren, 1876) and...
many others can easily be seen as strongly resembling species of *Spilosoma*, but we choose the usage of *Diacrisia* not only because its being an older name but also because both these genera differ considerably in male genitalic structure.

In our fauna, the genus is represented by two species.

### 76. *Diacrisia sannio* (Linnaeus, 1758)

(Pl. 16, Figs 1-6; Fig. 72; genitalia in Fig. 73 and Pl. 26, Fig. 12)


[≡ *Russula* Linnaeus, 1758; *culpinaria* Linnaeus, 1758; *sannio caucasiana* Strand, 1919; *Diacrisia sannio uniformis* A. Bang-Haas, 1907; *D. sannio syrdarja* Strand, 1919]

*sannio* – clown (Lat.)

[Clouded Buff, Clouded Ermine – (Engl.)]

[Rotrandbär – (Germ.)]

[Bordure Ensanglantée – (Fr.)]

Erschoff, 1874: 32, *Nemeophila russula*

Staudinger, 1887: 78, *Nemeophila russula mortua*

Staudinger, 1892b: 347, *Nemeophila russula pallida*

Secheposchnikoff, 1904: 253, *Diacrisia sannio caucasica*

Bang-Haas, A., 1907: 76, pl. 3, *Diacrisia sannio uniformis*

Spuler, 1910: 141, pl. 74, figs 16a-b, *Diacrisia sannio*

Seitz, 1910: 94, pl. 14, row k, *Diacrisia sannio*

Strand, 1919: 416, *Diacrisia sannio caucasiana*

Sedykh, 1974: 149, *Diacrisia sannio*

*Fig. 72. Diacrisia sannio* (L.), ♂. Kirghizia, Lake Issyk-Kul, 1600 m a.s.l., 16.VII.1980, leg. V. Murzin (photo by O. G. Gorbunov).
Subspecies:

*D. s. mortua* Staudinger, 1887 (including *f. uniformis*)

*D. s. pallida* Staudinger, 1892b

*D. s. caucasica* Schaposchnikoff, 1904.

**Description** (based on material from near Moscow, Russia). Male: alar expanse 38-40 mm. Fw yellow with hind edge and fringe pink. A dark spot on discal vein in the middle of fw. Hw pale yellowish with a gray-brown submarginal band (3.5 mm in width), a yellow edge and a pink fringe. Discal vein with a gray-brown spot. Head and thorax yellow. Antennae double-pectinate. Underside of hw yellow with a diffuse middle spot. Underside of fw dark gray with a yellow edge and a dark spot in the middle.

Female a little slenderer (34-36 mm), with a narrower fw. Upper side orange ochre with infuscation on transverse vein, hw with a dark pattern, i.e. a black spot on discal vein, a darkened fw base, a black submarginal band at inner edge connected to basal part. External edge of fw yellow. Underside of wing ochre yellow with discal and 1-2 submarginal macucae black. Two black rays running from basis of fw, base of hw infuscate.

**Variability** appreciable.

In Central Asia, in eremic parts like Syr-Darya and Ili rivers in particular, the form *uniformis* A. Bang-Haas (= *syrdarja* Strand) is known to occur; uniform yellow without dark pattern of fw and hw, underside likewise almost without dark pattern except for traces of a median spot; this form is common but does not seem to dominate (Pl. 16, Fig. 3);

ssp. *pallida* – a reduced black pattern (width of black belt on hw diminished); individual variations of this form occur in Europe, but more often in the central parts of Asia like the Altai, Dahuria and Tarbagatay Mts;

ssp. *mortua* – encountered in the Alai Valley, in the south of Fergana Valley and at Lake Issyk-Kul and, according to Seitz (1913), differing by a completely lacking pink coloration of fw hind edge. Hw yellow in coloration but black pattern persisting. Among the material available to us from the Lake Issyk-Kul region, there are samples with the inner edge either pink or yellow while the black pattern of the hw is clearer than in the central Russian, typical form.

Males from Mongolia are characterised by an even more strongly developed black edge of the hw and by a darkened underside of the fw;

ssp. *caucasica* [= *caucasiana* Strand] – Caucasus, Transcaucasia, a little deviating form with a more strongly developed dark pattern slightly surpassing the normal range of individual variation.

In general, only *mortua* (including *f. uniformis*) and *pallida* might indeed prove to deserve a subspecific rank.

**Distribution**. Pattern North Palaearctic.

Within the former Soviet Union. Baltic countries; Belarus; Ukraine; Crimea; Moldova; European Russia (except for such boreal parts as Karelia, central part of Komi Republic, Arkhangelsk); Caucasus; Transcaucasia (Armenia, Nakhichevan); central and southern Siberia (Ob River and Tomsk regions), Transbaikalia, central Yakutia.

Beyond the former Soviet Union. Western China, Mongolia.

**Biology**. Flight in June-July on forest glades and humid grassy lawns. In the daytime, easy to fly up from herbs. Caterpillar dark brown with reddish pubescence, a pale red, spotty, dorsal stria and white spiracles. From August to May,

**Similar species.** *D. irene*, has a pink color on the hw, a dark background coloration of the fw underside, and conspicuous male genitalia (Fig. 73).

### 77. *Diacrisia irene* Butler, 1881

*(Pl. 16, Figs 7-9; genitalia in Fig. 73)*

*Diacrisia irene* Butler, 1881: 6, TL: Japan.

[= *sannio rishiriensis* Matsumura, 1930a; *sannio rubrocentralis* Bryk, 1948]

[irene – a feminine name]

**Staudinger**, 1892c: 277, *Diacrisia russula amuri*

Spuler, 1910: 132, *Diacrisia sannio v. amuri*

Seitz, 1910: 94, pl.14, row k, *Diacrisia sannio irene*

Esaki et al., 1971: 210, fig. 2568, *Diacrisia sannio irene*

Dubatolov, 1985a: 70, *Diacrisia irene*

Dubatolov, 1985a: 70, *Diacrisia irene amuri*

**Subspecies:**

*D. i. amuri* Staudinger, 1892.

**Description.** Alar expanse 38-40 mm. Main colour of fw and hw ochre yellow. Hind edge of fw pink. Spots on fw also with pink colour. Submarginal stria on hw consisting of clear dark gray maculae. Discal spot angular, fringe pink. Underside of fw also yellow with gray subcostal belt and stria from base of fw along median cell to dark spot on discal vein.

**Variability** modest.

The ssp. *amuri* was originally referred to *D. sannio*, but Dubatolov (1985a) has shown that, as *amuri* differs considerably from *sannio* by genitalic conformation, it must be regarded as a separate species. Based on the external resemblance of the Japanese *D. irene* and the Russian Far Eastern *amuri*, however, even without study of pertinent material of *irene* but only using the pictures as presented by Inoue (1982), Dubatolov (1985a) has referred to *amuri* as a subspecies of *D. irene*. We have studied an example from Hokkaido and can confirm Dubatolov’s opinion.

**Distribution.** Pattern East Asian.

Within the former Soviet Union. The Far East, Middle Amurland; according to Dubatolov (1985a), Upper Cisamuria, Primorye, Sakhalin and southern Kuril Islands.

Beyond the former Soviet Union. Northeastern China, Japan and Korea.

**Biology.** Flight in the end of June and in July.

**Similar species.** *D. sannio*, differs mainly by lack of a pink colour on the hw, by the dark background coloration of fw underside, and by male genitalic structure (Fig. 73).

### 35. Genus *Rhyparioides* Butler, 1877


Fw with residual dark spots or spotty striae. In other respects, this genus is similar to *Diacrisia* Hübner, 1819. Male genitalia: juxta nearly rectangular with short denticles laterally in its apical 1/4-1/3. Aedaeagus with small spinules in apical portion (Fang, 2000).

Three species in our countries. From China, *Rhyparioides subcaria* (Walker, 1855) is known [= *Diacrisia subcaria* Walker, 1855].
Key to species of *Rhyparioides*:
1. Antennae of male bipectinate. ................................................................................................................................... 2
- Antennae of male biserrate......................................................................................................................................... 3
2. Fw median veins of male with dark red or brown pollination. Fw veins of female with scarlet tint. ...........................
- Fw with veins devoid of red tint. ...............................................................................................................
3. Abdomen crimson, fw without dark discoidal marking. ...............................................................................
- Abdomen orange, fw with a dark discoidal marking over a yellow background. ............................. *R. subvarius* (China)

78. *Rhyparioides metelkana* (Lederer, 1861)

(Pl. 15, Figs 10-12)

*Nemeophila metelkana* Lederer, 1861: 162. pl. 3, fig. 12, TL: Hungary (“Also-Dabas near Felsu-Dabas”).

[metelkana – after Fr. Metelka, a German inventor engineer]

Bremer, 1861: 477, *Chelonia flavicida*  
Hampson, 1901: 299, *Diacrisia flavicida*  
Spuler, 1910: 132, pl. 74, fig. 14, *Diacrisia metelkana*  
Seitz, 1910: 94, pl.14, row 1, *Rhyparioides metelkana*  
Esaki et al., 1971: 210, pl. 121, fig. 2565, *Rhyparioides metelkana*  
Dubatolov, 1985c: 86, *Rhyparioides metelkana*  
Fang, 2000: 326, pl. 14, fig. 16, *Rhyparioides metelkana*

Subspecies:  
*Rh. m. flavicida* Bremer, 1861.

**Description.** Alar expanse 40-42 mm. Fw of male lemon yellow, of female dark, yellow brownish. Male fw with several black points, an infuscate spot around discal vein and a dark vague stria along cubital vein. In addition, female with a series of reddish maculae. Hw of male rosy red with a black median spot and a series of submarginal spots. Female hw brighter.  

**Variability** modest.  
Ssp. *flavicida* – Primorye, Russia, Japan and Korea; coloration of fw less bright; dark pattern of fw weakened.  
**Distribution.** Pattern amph-Palaearctic.  
Within the former Soviet Union. Southern Ukraine; Rostov-on-Don Region, European part of Russia; Middle Amurland and Primorye, Far East.  
Beyond the former Soviet Union. Central Europe (northern France, some regions of Germany), part of Eastern Europe (Hungary, Poland, southern Slovakia, delta of Danube River) and Far East (Korea, China [Zhejiang (Daniel, 1955)], Japan).  
**Biology.** Preferring open places in woodland, meadows on river and stream banks. Flight from mid-June to mid-August. Last instar caterpillar pale yellow with two wide, dark, longitudinal striae divided by a narrow white line. Yellowish dorsal warbs on striae with gray-yellow, here and there reddish, hairs. Thoracic as well as 2-3 last segments with admixture of black hairs. Underside black-gray, false legs red-brown, thoracic legs and head black. Caterpillars often living in cane, *Phragmites* sp. (above and under the water, upon which they can move fast), on other water plants (*Iris*, water lily, *Nymphaea alba*, where they eat away round foramina in the middle of the plant), on *Taraxacum*, *Euphorbia*, *Caltha*, *Polygonum persicaria* (Fang, 2000). Larvae hibernating and can be found from spring to mid-June. Pupation in a yellowish cocoon on stems or leaves of plants. Pupa black-brown with reddish edges of segments (Spuler, 1910).  
**Similar species.** *Diacrisia sasano* and *D. irene*, differ by lack of a longitudinal stria on the fw; hw yellow, along inner edge of wing with rectangular spots sometimes fused into a belt; in female, basal part of hw dark.
79. *Rhyparioides amurensis* (Bremer, 1861)

(Pl. 17, Figs 1-2; genitalia in Pl. 26, Fig. 13)

*Chelonia rubescens amurensis* Bremer, 1861: 477, TL: Amur.

[amurensis – from Amur River (Lat.)]

Hampson, 1901: 298, *Diacrisia amurensis*

Seitz, 1910: 94, pl. 14, row i, *Rhyparioides amurensis*

Esaki et al., 1971: 210, pl. 121, figs 2566-2567, *Rhyparioides amurensis*

Fang, 2000: 326, pl. 14, fig. 16, *Rhyparioides amurensis*

**Description.** Alar expanse 42-44 mm. Fw of male bright yellow with a small number of black points (1-3 points in the middle of wing costal edge, sometimes on transverse vein and near hind edge), hw pink with black spots (one spot on median vein, 1-2 closer to base, and several spots forming submarginal series). All body yellow with series of black points on upper side and on each side of abdomen. Chaotically scattered brownish spots over a yellow surface of fw in female. Remaining pattern like in male.

**Variability** considerable.

*F. obliterata* Kardakoff, 1928 – distinguished by a slightly reduced black pattern.

Subspecies are known from Japan and China:

ssp. *meridei* Daniel, 1943 – China;


**Distribution.** Pattern Eastern Asian.

Within the former Soviet Union. Middle Amurland, Primorye, southern Kuril Islands.

Beyond the former Soviet Union. China: Kinkiang, Hubei, Sichuan, Heilongjiang, Henan, Zhejiang, Jiangsu, Dunbei, Hebei, Shaanxi, Fujian, Jiangxi, Hunan, Guangxi, Shanxi, Yunnan, Jilin, Liaonin, Nei Mongolia, Shandong (Dubatolov, personal communication; Fang, 2000); Korea; Japan.

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**Fig. 74.** Russia, Primorye, environs of Ussuriysk, forest glade with tiger lily in deciduous wood, a place supporting numerous and various tiger moth species like *Arctic caja phaeosoma* (Btl.), *A. flavia* (Fuessly), *Pericalia matronula* (L.), *S. kindermanni pretiosa* (Stgr.), *Diacrisia irene* Btl., *Rhyparioides nebula* Btl., *R. amurensis* (Br.), *R. metelkana* (Led.), *Rhyparia purpurata* (L.), *Amurrhyparia leopardinula* (Stgr.), *Chionarctia nivea* (Mén.), *Spilosoma lubricipeda* (L.) and others (photo V. S. Murzin).
Biology. Flight in July on forest glades in the belt of deciduous forest. Flying to light. Larva dwelling on Ulmus, Genista sp. (Fang, 2000).

Similar species. Rh. nebulosa, external edge of fw with a series of black points or strips.

80. Rhyparioides nebulosa Butler, 1877

(Pl. 17, Figs 4-5)

Rhyparioides nebulosa Butler, 1877: 396, TL: Yokohama, Japan.

[ = simplicior Butler, 1881]
[nebulosa – foggy, unclear (Lat.)]

Hampson, 1901: 314, 317, Diacrisia nebulosa
Seitz, 1910: 94, pl. 14, row i, Rhyparioides nebulosa
Esaki, 1971: 210, pl. 121, fig. 2564, Rhyparioides nebulosa
Fang, 2000: 325, pl. 14, fig. 15, Rhyparioides nebulosa

Description. Alar expanse 50 mm. Fw yellow. Male sometimes with black spots at costal edge. Hind half of fw except external edge dark, brownish. Body orange yellow with black points on upper side and on lateral sides of abdomen. Fw of female with brownish spots over its orange yellow background. Black points at external edge of fw in both sexes.

Variability insignificant.


Within the former Soviet Union. Southern Primorye, Kunashir Island.

Beyond the former Soviet Union. Japan (Hokkaido, Honshu), Korea, northern China (Dunbei, Nei Mongol, Heilongjiang, Jilin, Liaoning).

Biology. Flight in July on forest glades. Larvae living on Taraxacum mongolicum (Fang, 2000).

Similar species. Rh. amurensis, fw of male monochromous, yellow, with small black spots. External edge of fw without black points.

36. Genus Rhyparia Hübner, 1820

(Genitalia in Pl. 26, Fig. 14)

Rhyparia Hübner, 1820: 183, TS: Phalaena purpurea Linnaeus, 1758.

Dubatolov, 1985a: 66, Rhyparia

Moth of medium size. Fw yellow with dark spots. Accessory cell on fw missing. Antennae of male pectinate, of female bristly. Pulps long, directed down and forward. Proboscis developed.

Male genitalia: juxta semi-oval with numerous minute denticles in distal half, valva with a semicircular process bearing numerous denticles, aedaeagus strongly curved.

81. Rhyparia purpurata (Linnaeus, 1758)

(Pl. 17, Figs 3, 6, 7; Fig. 75; genitalia in Pl. 26, Fig. 14)


[ = obscura Rehberg, 1880; rhypariella Strand, 1919]
[purpurata – purple-dressed (Lat.)]
[Purpurbär – (Germ.)]
[Ecaillé Pourprée – (Fr.)]
Alpheraky, 1867: 14, Arctica purpurata caucasica
Krulikovsky, 1909: 172, Rhyparia purpurata barteli
Spuler, 1910: 131, Rhyparia purpurata uralensis
Seitz, 1910: 93, pl. 14, row h, Rhyparia purpurata
Warnecke, 1918: 81, Rhyparia purpurata gerda
Fang, 2000: 323, pl. 14, fig. 14, Rhyparia purpurata

Subspecies:
Rh. p. caucasica (Alpheraky, 1867)
Rh. p. barteli Krulikovsky, 1909
Rh. p. uralensis Spuler, 1910
Rh. p. gerda Warnecke, 1918.

Description. Alar expanse 40-43 mm. Fw bright yellow with numerous dark, sometimes weakly expressed, brownish spots. Hw red with contrasting black spots: two spots or striae close to base of wing, one in the centre of discal vein, and four spots forming submarginal series. Head, thorax and abdomen yellow. Latter with series of black points on dorsal side. Male antennae pinnate, female ones simple.

Variability. Individual variability appreciable (Fig. 75). Specimens with reduced dark spots on fw occurring everywhere (f. beroestripnesis Fuchs, 1897 and f. immaculata Fuchs, 1897). The ab. flava Staudinger, 1861 with orange hws occurs seldom. In f. flavescens Spuler, 1910 and f. transiens Spuler, 1910, red tint replaced to some extent by yellow.

The extremely aberrant form paradoxa Phillips, 1922 (Draudt, 1931, pl. 7, row c) is noteworthy (Fig. 75), in which the fw is brown with the gap of a yellow field in the basal part. The base of the hw is orange with a black external border taking up more than half of the wing.

The following subspecies can be accepted:
ssp. caucasica – dark spots on fw almost completely lost; a similar form occurring in the Zailiisky Alatau Mts east of Alma-Ata; the apparently close uralensis, which we only consider as a form or aberration of purpurata, shows diminished dark spots at the fw costal edge only;
ssp. barteli – southern Urals; diminished and attenuated spots on upper side of fw; probably this form can be joined with uralensis; Dubatolov (1996b) refers to barteli as a synonym of the nominotypical form;
ssp. gerda – small or partly vanishing black-gray spots in inner and middle parts of fw; in contrast, boundary spots wider and partly merged, especially in female; hw in female, boundary spots large; black spots on abdomen small or disappearing; Cisamuria, Primorye; East Mongolia, NE. China, Korea, Japan.

Distribution. Pattern Palaearctic.
Within the former Soviet Union. European Russia and all northern Asia except for the extreme North; Caucasus and Transcaucasia, southern Siberia, Cisamuria (Zeya) and Primorye.

Beyond the former Soviet Union. All Europe except for the extreme West; Asia Minor; Mongolia, northern China, Korea, Japan.

Biology. Inhabitant of various open biotopes, slopes of mountains supporting bushes up to 2000 m a.s.l., forest glades (except tundra and taiga). Males flying in the daytime about noon, females more active at night. Flight from early

Fig. 75. Individual variability of Rhyparia purpurata (L.) (after Spuler, 1906).
June to mid-July. Eggs small, yellowish. Coloration of last instar caterpillar black with a dorsal white stria. Warts light with small black points. Hairs on thorax of male red, on lateral sides yellow. In female, yellowish hairs prevailing. White transverse striae over gray ventral side. Last instar caterpillar up to 50 mm long. Larvae living from July until May on *Salix repens, S. phylicifolia, Sorbus aucuparia, Trifolium repens, Vaccinium myrtillus, Plantago major, Galium verum, Achillea millefolium, Artemisia campestris, Hieracium umbellatum* etc. Caterpillar hibernating.

**Similar species.** Similar species seem to be absent.

### 37. Genus *Amurrhyparia* Dubatolov, 1985

(Genitalia in Pl. 27, Fig. 1)


Differs by male genitalic structure, in particular by the uncus of a complex form, the presence of apical processes on the valve, and a strongly sclerotised aedaeagus with fingers in the apical part (Fig. 3).

“Palps direct, coated with long thick hairs. Head, thorax and abdomen also clothed with long, thick, erect hairs. Hairs on head a little longer. Body thick. Legs of medium length, femur beset with long erect, tibiae and tarsi with decumbent, hairs. Fore tibiae with an epiphysis, middle with one, and hind with 2 pairs of short calariae subequal in length to diameter of tibia” (after Dubatolov, 1985a: 66).

### 82. *Amurrhyparia leopardinula* (Strand, 1919)

(Pl. 17, Fig. 8; genitalia in Fig. 3 and Pl. 27, Fig. 1)

*Diacrisia leopardinula* Strand, 1919: 185 (replacement name for *Chelonia leopardina* Ménétriès, 1859a, non *Euprepia leopardina* Kollar, 1844), TL: Amur.

[leopardinula – small leopard (Lat.)]

Bang-Haas, O., 1936: 348, *Diacrisia leopardina manchurica*

Fang, 2000: 324, pl. 5, fig. 35, *Amurrhyparia leopardinula*

**Description.** Alar expanse 35-37 mm. Fw of male cream yellow, of female brownish. Fw with a black stria along cubital vein up to the middle of wing, and with 1-2 black spots in external part of wing. Hw cream pink, in female more intensively coloured, with a darkened base but a medially light cell, and with several submarginal spots. Head, thorax and abdomen of same colour as wings, abdomen darkened from above.

**Variability.** Reduced to the degree of development of the black pattern.

**Distribution.** Pattern Eastern Asian.

Within the former Soviet Union. Transbaikalia, Cisamuria, southern Primorye. Beyond the former Soviet Union. China (Shansi, Gansu, Chinhai, Tibet).

**Biology.** Flight on glades and at forest edges, over meadows in river flood-lands in June-July. Caterpillar polyphagous, reported on beans (Fabaceae) (Dubatolov, 1990d). This species is rather infrequent in collections.

**Similar species.** Easily identifiable by the black longitudinal stria running from the base of the fw. Other species have no such strip.

### Genus *Gonerda* Moore, 1879

(Pl. 6, Fig. 7)


Dubatolov (1996b) mentions a specimen of *G. perornata* Moore in the ZISP collection with a label reading “Przevalsk”. He considers this record as an error. Indeed, N. M. Przewalsky could have captured this specimen during one of his travels to the Himalaya while the label might show an incomplete name of the collector. Unfortunately, the
year when the moth was taken was not referred to. The town of Przhevalsk received the name only in 1889, after the
death of the traveller in 1888. Recently, it has been renamed as Karakol.

Earlier, only two species of Gonera were registered from the Palaearctic, i.e. Tibet, the Himalaya and Kashmir:
G. bretaudiaui Oberthür, 1896 and G. perornata Moore, 1879. Recently, Kishida (1995) has described five new species
from the high mountains of Nepal. Moths show a highly original pattern consisting of concentric bands and rings over
a bright yellow and red background. Females are short-winged. In the territory of the former Soviet Union, no species
of this basically Himalayan genus have reliably been recorded.

**Subfamily Spilosomatinae**

**38. Genus Ocnogyna Lederer, 1853**

Ocnogyna Lederer, 1853a: 78, TS: Chelonia zoraida de Graslin, 1836.

= Trichosoma Rambür, 1832: 272 (non Trichosoma Rudolphi, 1819 (Nematoda)), TS: Phalaena parasita Hübner, 1790
= Pachylistesia Rambür, 1866: 240, TS: Trichosoma boeticum Rambür, 1866
= Nototrachus Rambür, 1866: 245, TS: Nototrachus pierreti Rambür, 1866
= Somatrichia Kirby, 1892: 274, TS: Phalaena parasita Hübner, 1790

Small moths of modest coloration. Wing pattern of Type I. Flight at night. Proboscis not developed; wings of
female short or absent. Head strongly hairy. About three dozen species in Europe, North Africa, Asia Minor and China,
among them the following:

O. corsica (Rambür, 1832) (Corsica, Sardinia); O. pierreti (Rambür, 1841) (Algeria); O. baetica (Rambür,
1836) (Spain and North Africa); O. zoraida (de Graslin, 1837) (Spain); O. hemigena (de Graslin, 1850) (Pyrenees);
O. cypriaca O. Bang-Haas, 1934 (Cyprus); O. leprieuri Oberthür, 1878 (Algeria); O. pudens (H. Lucas, 1853) (Mor-
occo and southern Spain); O. latreillei (Goddart, 1822) (Spain); O. banghaasi Staudinger, 1895 (Iraq); O. mutabilis
Turati, 1924 (North Africa); O. nogelli Lederer, 1865 (Asia Minor); O. houlberti Oberthür, 1911 (Ta-tsin-lu =
Kanding, China); O. oberthueri Rothsechild, 1910 (Kuku-Nor); O. joiceyi Talbot, 1928 (Morocco); O. anatolica Witt,
1980 (Turkey); O. afghanica Ebert, 1973 (Afghanistan), etc. The latter species has been recorded at 2500-3000 m
a.s.l., its female remains in a cocoon where copulation, egg-laying and the emergence of young caterpillars take
place.

**Note.** Fang (2000) omits the genus Ocnogyna in the fauna of China.

Key to (potentially) our species of Ocnogyna:
1. External part of fw pale brown without dark spots. ................................................................. O. parasita
   –. External part of fw with large dark spots. .............................................................................. O. armena, O. loevii

As the external differences between O. loevii (Zeller, 1846) and O. armena Staudinger, 1871 are so insignificant,
only a study of the structure of the male genitalia is necessary to distinguish both species. In O. loevii, the uncus is
gradually tapering toward apex which is not wider than 0.1 mm; in O. armena, the uncus forms short and wide processes
at apex which is 0.2 mm wide or wider, its tip being blunt.

In our countries, only O. armena seems to occur.

**83. Ocnogyna parasita (Hübner, 1790)**

(Pl. 17, Figs 9, 10)

Phalaena parasita Hübner, 1790: 42, pl. 2, fig. 1, TL: Hungáry?

[parasita – parasite (Lat.)]

Lederer, 1865: 62, pl. 3, figs 3-6, Ocnogyna parasita nogelli
Staudinger, 1878: 335, Ocnogyna parasita intermedia
Seitz, 1910: 76, pl. 14, row c, Ocnogyna parasita
Bang-Haas, A., 1912: 108, pl. 6, fig. 3, Ocnogyna rothschildi
Spuler, 1913: 134, pl. 73, fig. 3a-b, Trichosoma parasita
Draudt, 1931: 73, pl. 6, row c, Ocnogyna rothschildi
Witt, 1980: 170, Ocnogyna parasita lianea, O. parasita arenosa
Dubatolov, 1996b: 63, Ocnogyna parasita

Subspecies:
O. p. nogelli Lederer, 1865
O. p. intermedia Staudinger, 1878

**Description.** Alar expanse of male 30-34 mm. Fw brown-gray with black, longitudinal, short striae and spots. External part of wing gray, without black pattern. Small black spots sometimes only at apex. Wings of female narrow and short.

**Variability** considerable:
- ssp. parasita – Hungary, Romania, Yugoslavia and the Pontus, Turkey;
- ssp. intermedia (Pl. 17, Fig. 9, 3; Fig. 10, 7) – black spots on fw diminished; a form transitional to the ssp. nogelli, from Asia Minor, in which black spots are totally missing;
- ssp. rothschildi – described from Samara, Volga region as a separate species, this variety might prove to represent the northeasternmost subspecies/form of O. parasita, which could have reached the Middle Volga region (Samara, Saratov, Kamysch) and possibly also the Ural River. Superficially, this moth is indeed very similar to O. parasita as depicted by Draudt (1931, 3). In rothschildi, separate black maculae are sometimes edged white. Males fly over the flood-plains of Volga River on sunny days in early April (see Draudt, 1931). The length of the fw in females is 4-5 mm. Females do not fly.

**Distribution.** Pattern Euro-Mediterranean.
Within the former Soviet Union. Moldova, Crimea, Black Sea coast of the Caucasus (Avadkharo), Transeucaasia, Middle Volga region, Uralsk (Zhuvalev, 1909).

**Biology.** Basically a mountain species, in France, Switzerland and the Caucasus occurring at 1300-2400 m a.s.l. Moth flight in one generation in February-April, appearing at once after snow melting. Caterpillar yellowish or brown, coated with yellow-brown hairs, with three light dorsal striae with dark points in interspaces, spiracles white. Head reddish with four dark points. Larva living in May-June on herbs, including grasses, Gentiana lutea, Plantago, Urtica, Scabiosa. Pupa red-brown in a grayish cocoon, hibernating, sometimes twice.

**Similar species.** There seem to be no similar species in our fauna.

*Ocnogyna loewii* (Zeller, 1846)

*Trichosoma loewii* Zeller, 1846: 9, TL: Asia Minor [“Istenas (Asia min.)”].

[= clathrata Lederer, 1845; andresi Draudt, 1931, herrichi Staudinger, 1879]

Lederer, 1855b: 202, pl. 2, fig. 7, *Trichosoma clathrata*

**Description.** Alar expanse 30-34 mm (male). Fw gray-brown with a white pattern of crossed bands. Hw white with dark spots. Head and thorax coated with thick hairs. Female wingless, similar to a woodlouse.

**Variability.** Individual variability insignificant.

**Distribution.** Pattern East Mediterranean.
Within the former Soviet Union. Probably absent.

**Biology.** Males flying in early spring. Larva living on Achillea, Chrysanthemum, Cirsium, Onopordum, Trifolium and some other herbs.
Similar species. *O. armena*, lighter, with a developed light pattern on the fw; a dark stria running from the costal edge of the hw to its centre; submarginal spots small.

84. *Ocnogyna armena* Staudinger, 1871

(Pl. 17, Figs 11-13)

*Ocnogyna loewii armena* Staudinger, 1871: 59, TL: Armenia.

Christoph, 1884: 109, pl. 7, fig. 1a-b, *Ocnogyna loewii pallidior*

Shestokin, 1975: 134-138, *Ocnogyna loewii pallidior*

Tilavov, 1978: 62, *Ocnogyna loewii pallidior*

Dubatolov, 1996b: 63, 71, figs 1d, 2i, *Ocnogyna armena daghestana*

Subspecies:

*O. a. pallidior* Christoph, 1884

*O. a. daghestana* Dubatolov, 1996.

Description. Alar expanse 30 mm. Fw dark brown with a pattern of gray striae. A rather wide stria parallel to hind edge of wing. Hw gray-brown with dark submarginal spots and a spot near discal vein.

Variability. Individual variability insignificant.

Several subspecies have been described from the territories considered:

ssp. *daghestana* – eastern Caucasus (Daghestan); spots on fw pale brown with darker borders, not uniformly dark brown as in *O. armena armena* (Pl. 17, Fig. 11) and other subspecies; hw with a spot at tornal angle; subterminal spots on hw forming a wide band extended from costa to vein M2; discoidal spot large;

ssp. *pallidior* – eremic parts of Central Asia (foothills of Kopetdagh, Repetek, Badhkyz (Fig. 76) etc.; northern Iran, Afghanistan) (Pl. 17, Figs 12-13); external spots divided by thin lines.

![Image](image-url)

Fig. 76. Turkmenistan, environs of Kushka, Badhkyz Nature Reserve, Kayý Jar Ravine, habitat of *Utetheisa pulchella* (L) and *Ocnogyna armena pallidior* Chr. (photo V. S. Murzin).
**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Daghestan; eastern Transcaucasia (Armenia; Azerbaijan); Turkmenistan (Kopetdagh, Greater Balkhan Mts, Badhkyz Nature Reserve, Repetek Nature Reserve, Mary, Chardzhou); southern Uzbekistan; southwestern Tajikistan.

Beyond the former Soviet Union. Iraq, Iran, North Afghanistan.

**Biology.** In Central Asia, occurring in eremic, semidesert and steppe landscapes; in Armenia in steppe, foothill and montane conditions up to 2000 m a.s.l. Males flying in the second half of night; arriving on light (Yerevan, slopes of Aragats Mt.) in the end of October and in November.

In southern Turkmenistan (Repetek, Badhkyz), males start flying in December. Females wingless, similar to woodlice, gray in colour, laying ~200 small, greenish, spherical eggs. Caterpillars appearing in early spring and feeding on numerous herbs like Achillea, Chrysanthemum, Cirsium, Onopordum, Trifolium etc. Early instars gregarious, exterminating grass on considerable areas and leaving cobweb coating over barren terrain. Last instar caterpillars living solitary. Larvae almost black in the beginning, later instars coated with dark brown hairs on dorsal side, with red hairs on lateral sides. Pupation deep under ground in the end of April to early May. Summer diapause as pupa. A mass species.

**Similar species.** *O. loewii*, differs by genitalic conformation. According to Dubatolov (1996b), the male genitalic structure (including *O. a. pallidior*) differs well from that of *O. loewii* from Asia Minor (Taurus Mts) and the Near East. The uncus of *O. loewii* tapers gradually towards the tip which is not wider than 0.1 mm; in *O. armena*, the uncus forming short and wide processes on top, the latter is blunt, 0.2 mm wide or wider.

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**39. Genus *Tajigyna* Dubatolov, 1990**


Head and palpi beset with long erect hairs. Body gracile. Probosces reduced, shorter than palpi. Eyes small, oval, without hairs. Antennae bipectinate, with long crests (more than 1 mm). Fore tibiae without spines at apex, equal in length to femur, carrying an epiphysis. Medial and hind tibiae with one pair of long thin calariae. On fw, vein R2 diverging from stem R(3+5).

By its genitalic conformation, this genus is close to *Ocnogyna*.

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**85. *Tajigyna gansoni* Dubatolov, 1990**

(Fig. 77)

*Tajigyna gansoni* Dubatolov, 1990a: 83, figs 1b, 2g, TL: Peter Great Mt. Range (Komsomolabad). Holotype in IB SD RAS.

[gansoni – after V. A. Ganson, an amateur entomologist from Moscow]
Description. Length of fw of male 13.5 mm. Fw brown; costal edge before central cell with three small white spots, their costal edge with yellow scales; fourth spot disposed closer to apex of discal vein, prolate, irregular in shape. A weak yellowish spot near apex of fw. A large, hexagonal, white spot between veins Cu1 + 2 and A2. Several white scales at base of vein M3 and in the middle of Cu1. Hw bright yellow with a brown basal field. External edge of hw with two brown spots; one more spot in a submarginal series closer to fore edge. Body coated with long black hairs and separate red scales.

Variability insignificant.

Distribution. Pattern Central Asian.

Within the former Soviet Union. Peter-I Mt. Range [Komsomolabad District, Tajikistan].

Beyond the former Soviet Union. Unknown.

Biology. Flight in the beginning of May on mountain slopes supporting high-montane steppe vegetation.

Similar species. No similar moths seem to be present in our fauna.

40. Genus Watsonarctia de Freina & Witt, 1984


= Eurachia Dubatolov, 1985: 147, TS: Arctia desert Bartel, 1902

= Eucaustana Leraut, 1985: 43, TS: Arctia desert Bartel, 1902

Antennae of male bipectinate, less than half as long as costal edge of fw, in female even shorter, simple.

86. Watsonarctia desert (Bartel, 1902)

(Pl. 17, Figs 14-15)


[= casta Esper, 1784, callesi Gymez Bustillo, 1979, esperi Koçak, 1980]

[deserta – eremic, lonely (Lat.)]

[Labkrautbär – (Germ.)]

[Ecaillle Saumon – (Fr.)]

Esper, 1784: 177, pl. 33, fig. 2, Bombyx casta

Seitz, 1910: 80, pl. 16, row e, Eucharia casta

Koshantschikov, 1924: 68, Eucharia casta sibirica

Bang-Haas, O., 1927: 59, pl. 8, fig. 9, Eucharia casta centralasiac

Bang-Haas, O., 1927: 59, pl. 8, fig. 10, Eucharia casta centralasiac ab. triangularis

Draudt, 1931: 75, Eucharia casta

de Freina, 1983: 105, Eucharia deserta karduchena

Dubatolov, 1996b: 64, Watsonarctia desert

Fang, 2000: 333, pl. 6, fig. 2, Eucharia casta

Subspecies:

W. d. sibirica Koshantschikov, 1924

W. d. centralasiac O. Bang-Haas, 1927

W. d. karduchena de Freina, 1983.

Description (based on specimens from Armenia). Alar expanse of male about 30 mm. Fw light with pink tint and brown spots. On fw, basal field brown, middle of fw with two spots. One triangular spot at fore edge, another at inner. External edge pale brown, as well as fringe. On hw, dark pattern consisting of spots near edge. Body brown.
Female smaller, alar expanse 26 mm. Pattern of fw same as in male but background lighter, almost white, and pattern brighter. Hw purple red with brown submarginal spots.

**Variability.** Individual variability reduced to variation in dark pattern. Sometimes dark median spots on fw fused both between themselves and with basal field.

Ab. *triangularis* – East Tian-Shan (“Yuldus”, China); hw median belt more angulate, triangular in shape.

The following geographically stable forms have been described:

- ssp. *centralasiae* – “Thianchan or., Juldus”, Ili, Issyk-Kul; Jarkand, Zaisan; hw median belt expressed only as a stroke at costal edge;
- ssp. *sibirica* – South Siberia (Minusinsk), Altai; in our opinion, superficially this form fails to differ from the nominotypical subspecies;
- ssp. *karduchena* – Transcaucasia and eastern Turkey.

**Distribution.** Pattern Euro-Siberian.

Within the former Soviet Union. European part of Russia: Penza, Ulyanovsk, Samara, Kazan, Ufa, Belaya River; Caucasus; Transcaucasia; northern and central Ukraine; northern Kazakhstan (Astana); South Siberia: Barnaul, Altai (Shebalino, Aktash, Ongudai), Khakassia, Minusinsk, Tomsk, Irkutsk.

Beyond the former Soviet Union. Europe: SW Germany, northern France, northern Iberian Peninsula, but absent from the Alps, the west part of former Yugoslavia, and Greece; Asia Minor; Mongolia; China (Xinjiang).

**Biology.** Flight in May. Inhabiting dry stony slopes and pastures, in rocky gorges; in the Altai occurring on subalpine meadows and on herb-clads slopes up to 2000 m a.s.l. Caterpillars living on various herbaceous plants like *Galium*, *Asperula*, *Achillea* etc. since May until August. Larvae blackish with a yellow dorsal stria on each segment broken by prolate, quadrangular, velvety black spots. One more light line extended on lateral sides of body. Warts blackish, hairs black-gray. Head black-brown. Pupation in a loose ovoid cocoon made of ground and hairs. Pupa hibernating.

**Similar species.** There seem to be no similar species in our fauna.

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### 41. Genus *Chionarctia* Kôda, 1988

(Genitalia in Pl. 27, Fig. 2)


= *Gigantospilosoma* Dubatolov, 1990c: 95, TS: *Dionychopus niveus* Ménétrîes, 1859

Wing pattern of Type II A.

### 87. *Chionarctia nivea* (Ménétrîes, 1859)

(Pl. 17, Fig. 16)

*Dionychopus niveus* Ménétrîes, 1859a: 218, TL: unknown [Amur (?)].

[nivea - snowy (Lat.)]

Seitz, 1910: 85, pl. 15, row h, *Spilosoma niveum*

Dubatolov, 1996b: 64, *Chionarctia nivea*

Fang, 2000: 414, pl. 17, fig. 1, *Chionarctia nivea*

**Description.** Alar expanse 60-65 mm. Wings and body white with one small black point in the middle of fw and a thin black bracket on discal vein of hw. Abdomen on upper side and on each lateral side with five series of black points. Lateral sides with a series of red spots. In addition, tibiae of all legs red on outer side.

**Variability.** Occasionally with additional, small, black points.

**Distribution.** Pattern East Asian.

Within the former Soviet Union. Middle Amurland; Primorye; southern Sakhalin; Kuril Islands (Kunashir).

Beyond the former Soviet Union. China (Dunbei, Hebei, Nei Mongolia, Shaanxi, Zhejiang, Fujian, Hubei, Hunan, Guangxi, Sichuan); Korea (Simpkho); Japan (Hokkaido, Honshu, Shikoku, Kyushu).
Biology. Flight in July on forest glades and at forest edges. Caterpillars hibernating at early instars. Last instar caterpillar up to 65 mm long, dirty gray with light lateral spots and long yellow-gray fasicules of hairs. Food plants: *Triticum sativum*, *Panicum* sp., *Plantago major* (Fang, 2000).

Similar species. There seem to be no similar species in our fauna.

42. Genus *Alphaea* Walker, 1855


Congeners mainly occur from Kashmir to western China and northern India. Only *A. melanostigma* (Erschoff, 1872) reaching the territories concerned in the present paper. The type species occurs in India and China.

Pattern of fw consisting of a white background and alternating black patches. Male genitalia: tegumen with small postero-subventral projections.

88. *Alphaea melanostigma* (Erschoff, 1872)

(Pl. 18, Figs 1-3)


[= *karakorumica* Daniel, 1961]

[melanostigma - marked by black (Lat.)]

Erschoff, 1874: 33, pl. 2, fig. 30, *Spilosoma melanostigma*  
Groum-Grshimaïlo, 1890: 539, *Spilosoma melanostigma*  
Seitz, 1910: 85, *Spilarctia melanostigma*  
Dubatolov, 1996b: 64, *Alphaea melanostigma*

Description. Alar expanse 45-50 mm. Head, thorax and wings pale yellow. Fw with numerous black points and striae, hw with black spots on discal vein and several spots along external edge. Abdomen from above yellow, underside lighter, with a series of black points.

Variability. Expressed in different degrees of manifestation of the black pattern (Pl. 18, Fig. 3).

Distribution. Pattern Central Asian and North Indian.  
Within the former Soviet Union. Pamirs-Alai: Zeravshan, Alai and Transalai Mt. ranges; Pamirs: Hissar and Rushan Mt. ranges, Khorog.  
Beyond the former Soviet Union. Afghanistan; Pakistan; North India (Himalaya, to Sikkim and Assam in the south); China (Qinghai).

Biology. Flight at 1500-2500 m a.s.l. in gorges and on slopes of mountains supporting sparse woodlands. At lower altitudes, appearing in May, at higher elevations in July. Willingly flying on light. Females laying eggs in groups. Eggs small, ball-shaped, yellowish. Caterpillar of instar 1 light, yellow-gray, last instar almost black, coated with long silky hairs, highly mobile. Feeding on various herbs, including dandelion (*Taraxacum*), plantain (*Plantago*), *Astragalus* etc. Pupa hibernating.

Similar species. There seem to be no similar species in our fauna.

43. Genus *Andala* Walker, 1855


Antennae of male bipectinate. Forehead (epicranium) coated with long pale hairs. Palpi short, directed forward, hairs on them short. Probosces missing. Eyes large, bare. On hw, Se + R1 merging with R up to the middle of cell. Abdomen with spots from above and on each lateral side.
Except for two species occurring in our territories, the Chinese *A. wiltshirei* (Toulgoet, 1962) and *A. unifascia* Walker, 1855 belong to this genus.

Key to our species of *Andala*:
1. Abdomen from above yellow. ........................................................................................................................................ *A. guttata*
   – Abdomen from above pink. ....................................................................................................................................... *A. transversa*

### 89. Andala guttata (Ershoff, 1874)

(Pl. 18, Figs 14-15)

*Arctia guttata* Ershoff, 1874: 32, pl. 2, fig. 28, TL: Urgut (headstream of Zerafshan River).


**Description.** Alar expanse 29 mm. “From above, fw slightly yellowish white, with several spots ashy gray in colour, in particular at fore and inner edges, and with fringe of variable colour, whitish and grayish; main colour of hw a little lighter than of fw, with two ashy gray small spots at anal angle. Underside of fw lighter than from above; pattern translucent from upper side. Thorax yellowish white with three dotted spots. Abdomen from above yellow with a series of blackish maculae, underside monochromous white” (Ershoff, 1874).

**Distribution.** Pattern Central Asian.
- Within the former Soviet Union. West Tian-Shan (Mt. Chimgan), Pamirs-Alai (Alaiskiy and Hissarskiy Mt. ranges).
- Beyond the former Soviet Union. Eastern Afghanistan

**Biology.** Flight in July at 2000-2800 m a.s.l.

**Similar species.** *A. transversa*, main colour of fw gray, hw the same, fringe monochromous, abdomen pink red.

### 90. Andala transversa (Moore, 1879)

(Pl. 18, Figs 6-7)

*Cycnia transversa* Moore, 1879a: 398, TL: Hindu Kush (?)

[= *puella* Staudinger, 1887; *vartianae* Daniel, 1965]

**Description.** Alar expanse 30-34 mm. Wing ashy gray with dark spots. Head and thorax same in colour. From 4 to 6 dark cuneiform spots (spike of wedge directed toward centre of wing) along costal edge of fw, the same number of spots at hind edge and 1-2 irregularly shaped spots in the middle of wing. External edge also with black points. Hw with small vague spots. Abdomen pink from above and gray on underside. Series of black points along dorsal side and on each lateral side. Female a little larger with pink tint.

**Variability.** Expressed to a greater or lesser extent in the development of a dark pattern.

**Distribution.** Pattern Central Asian.
- Within the former Soviet Union. Pamirs-Alai (Alaiskiy and Zaalayskiy Mt. ranges), Pamirs (Peter-I, Zeravshanskiy and Hissarskiy Mt. ranges).
- Beyond the former Soviet Union. East Afghanistan, NW. Pakistan.

**Biology.** Flight in July at night at 1700-2500 m a.s.l. within the belt of leafed and juniper woodlands. Often arriving on light.

**Similar species.** In *A. guttata*, the main colour of the fw is pale, whitish; the fringe is chequered, the abdomen from above is yellowish.
44. Genus *Hyphantria* Harris, 1841

(Genitalia in Pl. 27, Fig. 3)

*Hyphantria* Harris, 1841: 255, TS: *Phalaena textor* Harris, 1828.

= *Hypantria* Clemens, 1861 (misspelling)

Strand, 1919: 248, *Hyphantria*

Fang, 2000: 450, *Hyphantria*

Wing pattern of Type II A. Fws monochromous with separate spots or points.

A North American genus. In our fauna, only one representative is known to occur.

91. *Hyphantria cunea* (Drury, 1773)

(Pl. 18, Figs 8-9; genitalia in Pl. 27, Fig. 3)

*Phalaena cunea* Drury, 1773: 36, pl. 18, fig. 4, TL: Canada.

[= *liturata* (Goeze, 1781); *punctatissima* (Smith, 1797); *budea* (Hübner, 1823), *textor* (Harris, 1828); *mutans* Walker, 1856; *punctata* Fitch, 1857; *pallida* Packard, 1864; *candida* Walker, 1865; *suffusa* Strecker, 1900; *brunnea* Strecker, 1900]

[cuneus – wedge (Lat.)]

[Fall febworm moth, spotless fall web-worm – (Engl.)]

[Weisser bärenspinner, Wehebir, Weberspinner – (Germ.)]

[Écaillé fileuse (larva) – (Fr.)]

[American white moth – (Rus.)]

Fang, 1981: 340, *Hyphantria cunea*

Dubatolov, 1996b: 65, *Hyphantria cunea*

Fang, 2000: 350, *Hyphantria cunea*

**Description.** Alar expanse 22-36 mm. Fw and hw white, sometimes fw with black points, orange markings on body and legs. Head strongly pubescent, abdomen with a white pappus.

**Variability.** Becomes apparent generally in a greater or poorer development of black spots on the fw. Specimens with numerous points on the fw have been referred to as *f. punctatissima* Abott & Smith, 1797 (Pl. 18, Fig. 9).

**Distribution.** Pattern North American, introduced to Europe and East Asia.

Within the former Soviet Union. Found for the first time in 1952. At present the species has been recorded in Transcarpathia, Moldova and in the south of Ukraine, in the Crimea and the Primorye, Russian Far East. The advance of the American white moth continues northward and eastward with a rate of up to two dozen kilometres per year. Based on suitable climatic conditions, in the future the geographical range of this species can prove to reach the Leningrad, Vologda and Perm regions as well as the Urals in the northeast.

Beyond the former Soviet Union. North America (USA, Canada); Japan; China.

**Biology.** This species is a dangerous pest of many fruit and other arboreal cultures as well as herbs. Altogether, more than 240 species are currently known as its food plants. Flight in June (first generation), July and August (second generation). Egg laying on the underside of leaves, 400-500 eggs per batch, altogether 1000-1500 eggs, density about 400 eggs per sq. cm. The egg is spherical, 0.5-0.55 mm in size, with a flat base, yellowish virescent in colour. Egg batches coated with white fluff (Churaev, 1962). Larvae gregarious, forming large silk webs on tree branches. Younger larval instars feeding on the epidermis of both sides of the leaf, leaving veins untouched. Older larvae consume the entire leaf, leaving intact only the petiole. Caterpillar from above velvety brown with black warts; on each lateral side with a yellow band with orange warts. Last instar caterpillars up to 35 mm long, living in cobweb nests, sometimes weaving entire tree crowns.

In America, two different forms of larva are known to exist. In the northern part of the range, larvae show a black head capsule, a yellowish or greenish body with a dark stria at the foot of each lateral side, and black and orange warts
with long whitish hairs located along the stria’s borders. More southerly, larvae demonstrate an orange or reddish head, a yellowish-tan body with orange or reddish warts and brownish hairs. Most probably, our countries have gained in the northern form only. In 40-50 days, the larva pupates in a light cocoon. In our conditions, two generations per year are formed. Hibernation as pupa, frost resistance up to -25°C.

In Central Europe and the former Soviet Union, more than 100 insect species have been registered that prey on the pupae and/or caterpillars of the American white moth (Sharov & Izhevskiy, 1987: 290-298). In the former Soviet Union, the entomophages include Larvicora (Tachina) larvarum L., Tachina fallax Meig., Compsilura concinnata Meig., Ceromasia nigripes Flm., Apantelles plutellae Kurg. and many others (Churaev, 1962: 69-70).

**Similar species.** Superficially, the moth resembles Spilosoma lubricipeda (Pl. 19, Fig. 4) or S. urticae (Pl. 18, Fig. 11) but both latter species show a yellow abdomen with black spots.

### 45. Genus *Diaphora* Stephens, 1827

*(Genitalia in Pl. 27, Fig. 4)*

*Diaphora* Stephens, 1827: 244, TS: *Phalaena mendica* Clerck, 1759.

= Cyenia auct., non Hübner, 1818

Wing pattern of Type II C, fws uniform, without pattern. Wings slightly translucent. Male wings white or brown, female white. Head and body densely coated with hairs. Eyes completely hidden in hairs. Pollination thin.

A single species.

### 92. *Diaphora mendica* (Clerck, 1759)

*(Pl. 18, Figs 10-13)*

*Phalaena mendica* Clerck, 1759: 1, pl. 3, fig. 5, TL: “Kalkgebirge” (Europe).

[= punctata (Geoffroy, 1785); rustica (Hübner, 1790); inversa Caradja, 1898; binaghi Turati, 1910; mendicana Strand, 1919; venosa Adkin, 1922; sabulosa Derenne, 1929; malatiana Bytinski-Saltz, 1936; radiata Cockayne, 1949; circumpunctata Cockayne, 1949; stripata Cockayne, 1951; pallida Lempke, 1961]

[mendica – mendicant (Lat.)]
[Muslin Moth – (Engl.)]
[Graubär – (Germ.)]
[Ecaille Mendiante – (Fr.)]

Fixsen, 1887: 335, *Diaphora mendica*

Staudinger, 1892c: 289, *Diaphora mendica*

Seitz, 1910: 91, pl. 17, row b, *Diaphora mendica*

Esaki, 1971: 213, fig. 2579, *Diaphora mendica*

**Description.** Alar expanse 31-33 mm. Male light brown with two black points in cubital cell (one on fork of cubital and discal veins, the other closer to base). Thorax of the same colour, pubescent. Abdomen darker. Female white, wings slightly transparent, same as in male with black spots and often with an additional point at costal edge.

**Variability.** Individual variability expressed in additional black points on fw and hw.

The following colour forms are known:

* f. rustica – male as white as female. In Armenia (Mt. Aragats), all ca. 25 males collected by us showed such a coloration. On the Black Sea coast of the Caucasus, the white form of the males appears to prevail, with brown specimens being rare. In contrast, in central Russia brown males dominate.

A number of experiments on the hybridization of the moths of various coloration and also representing some closely related species are known to have been carried out. Standfuss (1896) interbred f. rustica males with females “from a normal population” (i.e. containing brown males). As a result, yellowish males (f. standfussi Caradja, 1894)
were obtained. By subsequently interbreeding males of *f. rustica* and females of *f. standfussi*, Caradja got females with spots resembling a completely different species. Unfortunately, as no further experimentation in this field seems to have ever been completed, no generalization of results at the genetic level can be drawn.

**Distribution.** Pattern Euro-Siberian.

Within the former Soviet Union. Baltic countries; Belarus; Ukraine, Crimea; Moldova; European part of Russia (from Karelia and southern part of Komi Republic to Tąganrog, Rostov-on-Don Region and Caucasus); Transcaucasia (Mt. Aragats and Lake Sevan in Armenia; Nakhichevan); South Siberia (from Kurgan, Tobolsk, Tomsk, the middle flow region of Angara River, Irkutsk to Kazakhstan, Altai and the southern coast of Lake Baikal).

Beyond the former Soviet Union. Europe: southern Scandinavia and southern England (absent from the Iberian Peninsula and Greece); northern Turkey; Syria; Lebanon.

**Biology.** Flight from the end of April (early spring) until June. Males flying on light. Females in the daytime taking short flights on forest glades, at edges of woods, and on overgrown slopes of ravines. In the mountains, reaching 2000 m a.s.l.

Egg spherical, yellowish white. Young caterpillar pale, coated with long yellow ochre hairs. Last instar caterpillar from above greenish brown with one thin, aborted, light stria. Lateral sides virescent or yellowish. Fascicles of hairs on warts reddish or brown-gray. Head and thoracic legs dark red.


**Similar species.** *Hyphantria cunea*, fw purely white without black points; alar expanse 1.5 times less, fw narrower. The spotted form of *H. cunea* differs by the considerably developed spotted pattern. *Eudiaphora turensis* reminds of the brown male form of *Diaphora mendica*, but differs easily by the developed dark pattern and the yellow spotted abdomen.

### 46. Genus *Eudiaphora* Dubatolov, 1990

(Generitalia in Pl. 27, Fig. 5)


Fang, 2000: 354, fig. 248 (generitalia).

“Fw brown-gray, with black discal spots and two belts of spots, one subbasal, the other postdiscal. Sometimes (rarely) with submarginal spots at apex of fw and with basal spots. Hw with a discal spot. Head small, coated with rich erect hairs; palpi pubescent, a little longer than head. Eye large, semispherical, bare. Antennae of male bipectinate with long crests, of female two-dentate. Proboscis reduced. Body rather narrow, beset with long hairs like legs are. Fore tibiae with a long epiphysis, middle tibiae with one pair, hind with two pairs, of thin calariae” (Dubatolov, 1990e).

Dubatolov isolated this genus from *Diaphora* based on genitalic conformation. Valves in *Diaphora* are short, wide, with a sharp process in the inner part. In *Eudiaphora*, there is no such a sharp protuberance, the male genitalia show a broad triangular uncus, the valva is straight, not fucated at apex.

### 93. *Eudiaphora turensis* (Erschoff, 1874)

(Pl. 18, Figs 14-19)

*Spilosoma turensis* Erschoff, 1874: 33, pl. 2, fig. 29, TL: Kyzyl-Kum Desert (“inter Ulus et Djam”).

[= *turensis maracandica* Seitz, 1910; *afghanistanensis* Daniel, 1966]

[turensis – Turan (Lat.)]

Seitz, 1910: 92, pl. 17, row d, *Diaphora turensis maracandica*
THE TIGER MOTHS OF THE FORMER SOVIET UNION

Daniel, 1966: 163, pl. 3, fig. 1, Diaphora afghanistanensis
Dubatolov, 1996b: 65, Eudiaphora turensis

**Description.** Alar expanse 37-39 mm. Moth gray-brown with black points on fw. First point located at base of fw, followed by a series of points forming a curved stria. One or several small points on transverse vein, finally followed by an arcuate stria running from costal edge to inner one parallel to a convex external edge. Both position and expression of the stria strongly variable. A crescent spot on discal vein of hw. Head and body dark brown, coated with silky hairs. Abdomen on lateral sides yellow, with dark points.

**Variability.** Considerable.

_F. maracandica_ – Seitz (1910), crediting Staudinger as author of this form, quoted it from Turkestan, “...much larger, a black transverse stria unclear, often also a little lighter ...”. Such a too general description coupled with “Turkestan”, much of Central Asia, allows for no identify of this form to be attempted prior to a restudy of type material.

As the abundant material available to us shows, the variation range of this species is quite profound, being expressed in reduction or loss of a black pattern as well as varied coloration. The geographical range of this species occupies extensive territories of Central Asia and Kazakhstan. In the east, in the foothills of Dzhungarskiy Alatau Mts, darker specimens appear to prevail. In the West Pamirs and the Hissarskiy Mt. Range, lighter moths with a black pattern are dominant. However, there are samples with a completely missing pattern or only with a single median spot on the hw. Specimens from Chimgan Mts, Chatkalskiy Mt. Range are darker, the pattern is poorly expressed, and the moth is a little smaller (alar expanse 33-35 mm).

The following form from the environs of Bakanas, inferior flow of Ili River, Kazakhstan is noteworthy:

_f. yuldashevi_ forma nova – coloration of wing, head and thorax very light cream or sandy yellowish upon conservation of a usual pattern (3 males) (Pl. 18, Fig. 18). This moth was collected by S. Murzin in early August as opposed to the usual _E. turensis_, whose flight period is in the spring. The systematic status of this form is unclear. Probably the moths belong to the second generation that appears infrequently.

This new form is named in honour of friend A. A. Yuldashev, from Tashkent, who helped in our work.

From Afghanistan, _Diaphora afghanistanensis_ Daniel has been described, which differs a little from _E. turensis_ both superficially and by genitalic structure. In appearance, _D. afghanistanensis_ seems to be similar to _E. turensis_.

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Fig. 78. Kazakhstan, Ili River, banks supporting _Eucharis festiva iliensis_ (Wagner), _Tancrea paradoxa_ Pngl., _Watsonactia deserta centralasiae_ (O. B.-H.), _Eudiaphora turensis_ (Er.), _Diacrisia sannio_ (L.) and some others (photo V. S. Murzin).
from the Hissarskiy Mt. Range and, though Dubatolov (1996b) considers it as a synonym of E. turensis, its status is not clear to us.

**Distribution.** Pattern Central Asian.

Within the former Soviet Union. Foothills of Kopetdagh and Kuhitang-tau Mt. ranges, Samarkand, Chardzhou, Nuratau, Syr-Darya River; Ferganskiy Mt. Range and Ferghana Valley; western Chatkal (Chimgan, Brich-Mulla, Parkent, Khumsan), Karzhantau, Alaiskiy, Turkestanskiy, Hissarskiy and Zeravshanskiy Mts; Kazakhstan (Sugety-Tau Mt. Range, Ili River: Bakanas; Zailisliy Ataata, Chimkent, Ketmen Mts); West Pamirs (Khorog).

Beyond the former Soviet Union. Afghanistan; NW. China (Xinjiang).

**Biology.** Occurring in semideserts or sufficiently dry places, basically on plains and at foothills, but sometimes in the mountains up to 2000 m a.s.l. Over plains, flight in spring, at end of April or in May, in the mountains up to mid-July. Very common.

**Similar species.** Diaphora mendica, brown males differ by the almost uniform brown abdomen.

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**47. Genus Spilosoma Curtis, 1825**

(***Genitalia in Pl. 27, Fig. 6***)

*Spilosoma* Curtis, 1825: pl. 92, TS: *Bombyx menthsatri* Denis & Schiffermüller, 1775 [= *Phalaena lubricipeda* Linnaeus, 1758].

= **Spilosoma** Stephens, 1827: 1, 242, TS: *Phalaena lubricipeda* Linnaeus, 1758

= **Ardices** Walker, 1855: 709, TS: *Arcides fulcohirta* Walker, 1855

= **Rhaagonis** Walker, 1862: 270, TS: *Rhaagonis bicolor* Walker, 1862

= **Spilarctia** Butler, 1875 (part): 3, TS: *Phalaena lutea* Hüfnagel, 1766

= **Elpis** Dyar, 1893: 36, TS: *Antarctica rubra* Neumoegen, 1884 (preocc. *Elpis* Mulsant, 1850, Coleoptera)

Moth of medium size. Wing pattern of Type II A. Fws monochromous with separate spots or points. Wings white, with 12 veins, sometimes with black points. Abdomen thick, yellow, red or white, with series of spots on dorsal and lateral sides. Palps short, invisible among fascicles of hairs covering entire forehead (epicranium). Proboscis abortive. Antennae of male pectinate, of female filiform.

Except for the species considered below, the following Palaearctic congeners are known: *S. rostagnoi* (Oberthür, 1911) (W. China); *S. caeria* (recte: -um) (Püngeler, 1906) (Kukunor, China); *S. erythrozona* (Kollar, 1844) (Kashmir); *S. rybakowi* Alpheraky, 1897 (from W. China to Korea); *S. fujienensis* (recte: -se) Fang, 1981 (Fujian, China); *S. extrema* (recte: -um) Daniel, 1943 (Yunnan); *S. likiangensis* (recte: -se) Daniel, 1943 (Yunnan); *S. menshunicum* Daniel, 1943 (Shans); *S. ningyuenfui* Daniel, 1943 (Sichuan, China); *S. daitoensis* (recte: -se) (Matsumura, 1930) (Taiwan). Several species are also known from North America. The total number of species in this genus amounts to more than 30.

**Key to our species of Spilosoma:**

1. Abdomen from above yellow. ......................................................................................................................... 3

− Abdomen from above red. ................................................................................................................................. 2

2. Fw with black spots ......................................................................................................................................... 3

− Fw white. ............................................................................................................................................................. 2

3. Antennae of male uniform black, long, only slightly shorter than cell length. .............................................. S. streltsovi

− Antennae of male noticeably shorter than length of cell (not more than 2/3 its length). ............................... 4

4. Combs of antenna white. Fw with few black points. Point on discal vein of hw more often missing. .......... S. urticae

− Combs of antenna black. .................................................................................................................................. 5

5. Fw with numerous black points scattered without any order over surface of fw. ........................................ S. lubricipedum

− Some of the points located in transverse series ............................................................................................ S. mandli

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**94. Spilosoma lubricipedum** (Linnaeus, 1758)

(Pl. 19, Figs 4-9; genitalia in Fig. 80 and Pl. 27, Fig. 6)

Description. Alar expanse 35–40 mm. Wings white with numerous black points. Abdomen orange with black dorsal spots. Hw white, only occasionally with a dark discoidal dot and 2–3 submarginal dots. Combs of antenna dark from above.

Variability. Everywhere common, providing ample possibilities for studying variation. Most of the variations reduced to the number of points on fws, e.g. fw with three or several points only, hw spotless, and so on. The following aberrations and forms are noteworthy:

ab. transitoria Oberthür, 1912 – fw obscurely brownish;
ab. unipuncta Strand, 1929 – with one point on fw;
ab. apicicistriγata Kardakoff, 1928 – only a short apical stria on fw, remaining black points disappearing;
ab. flavocoteriγata Kardakoff, 1928 – without black spots on abdomen.

The latter two forms have been described from Narva Island near Vladivostok.

f. ochrea Seitz, 1910 – fw of sandy colour;
f. brunea Oberthür, 1896 – fw brownish;
f. luxerii Goddart, 1822 – fw on upper side pink red, underside with brownish bloom;

Distribution. Pattern Palaearctic.

Within the former Soviet Union. Nearly all European part (rare in the Crimea, in the north up to Karelia and Arkhangelsk), Siberia (south of 58° N), Transbaikalia, Amurland, Far East (Primorye); Caucasus and western Transcaucasia; Kazakhstan; Central Asia.

Beyond the former Soviet Union. All Europe; NW. China, Korea, Japan.

Biology. Flight from the end of May until July on forest grassy lawns, in parks and gardens. Caterpillar dark brown with brown fasicles of hairs on warts and with a reddish dorsal stria. Spiracles white. Larvae living from the end of July until next spring on various herbs or bushes like Urtica dioica, Polygonum calcatum, Rumex spp., Pisum sativum, Trifolium spp., T. repens, Geranium sanguineum, Vaccinium uliginosum, Plantago spp, Taraxacum spp., Lactuca sativa, Sulix phylicifolia, Rubus idaeus etc. Caterpillar hibernating.

Similar species. S. urticae, number of black points on fw significantly less, stem of antenna from above substantially white. According to Mikkola (1975), in the male the crests of the antennae are differentiated, with low crests 2 times longer than stem diameter, at apex of antenna not longer than stem thickness. S. punctarium, has a red abdomen.

95. Spilosoma punctarium (Stoll, 1782)

(Pl. 19, Figs 1-3)


[ = punctigera Motschulsky, 1861; roseicenter Snellen, 1863; dornesi Oberthür, 1879; doerrisi Oberthür, 1881; punctarium miserata Bryk, 1942]

[punctarium – pointed (Lat.)]

Seitz, 1910: 87, pl. 15, row f, Spilosoma punctarium

Fang, 2000: 418, pl. 17, fig. 4, Spilosoma punctarium
Description. Alar expanse 38 mm. Fw white with black points. Hw with several round small spots on discal vein and in a submarginal series. Body white except for a red upper side of abdomen. Abdomen with five series of black points, one row each on upper side, at border of red and white on lateral side, and lower subventrally over white part. Thorax and first segments of abdomen coated with white pubescence. Tip of abdomen white. Antennae black.

Variability. Number of points on fw considerably varied. In some specimens with a large number of points, they form a diagonal stria from fw apex to inner edge like in some species of Spilarctia Butler.

Distribution. Pattern East Asian.
Within the former Soviet Union. Middle Amurland (Pushkovo, Raddevka, Blagoveshehensk, Khabarovsk), Primorye (Ussuriysk, Sikhote-Alin, Barabash, Khasan), southern Kuril Islands.
Beyond the former Soviet Union. Central and eastern China; Korea; Japan.


Similar species. S. urticae and S. lubricipedum, abdomen yellow.

96. Spilosoma urticae (Esper, 1789)

(Pl. 19, Figs 11-12; Pl. 20, Figs 1-3; Fig. 79; genitalia in Fig. 80)

Phalaena urticae Esper, 1789: 3, 20, pl. 83, fig. 2, TL: Europe (?) [= Phalaena papyratia Marsham, 1791]

[urtica – nettle (Lat.)]
[Water Ermine – (Engl.)]
[Nesselbar – (Germ.)]
[Ecaille de l’ortie – (Fr.)]

Fig. 79. Spilosoma urticae (Esp.), ♂. Russia, Tula Region, Tatinki, 53°40′ N, 38°45′ E, 13.VI.1998 (photo by O. G. Gorbunov).
Description. Alar expanse 35-40 mm. Wings white with few black points. Hw without spots. Abdomen orange with black dorsal spots. Combs of antenna white (except for apex).

Variability. Some specimens showing either an enlarged number of black points or devoid of them.

Distribution. Pattern Palaeartic.

Within the former Soviet Union. Southern Baltia (Lithuania); Belarus; Ukraine, Crimea; Moldova; European part of Russia (Bryansk, Orel, Tula, Moscow, Kazan, Penza, Saratov), South Siberia (south of the line Kurgan, Novosibirsk, Tomsk and middle flow of Angara River), Transbaikalia, Middle Amurland (Zeya, Blagoveshehensk), southern Primorye; Caucasus; Transcaucasia; Kazakhstan (Ili River, Zailiiskiy Alatau); Central Asia (Bishkek, Osh, Ferghana, West Tian-Shan).

Beyond the former Soviet Union. Western Europe (from southern England and southern Scandinavia to northern Italy and northern Balkans); northern Iran (Chelus); China (Xinjiang, Sichuan, Jiangsu).


Similar species. S. lubricipedum, number of black points on fw significantly higher, crests of antenna black. Male crests of antennae 2 times longer than stem diameter at apex, and 3 times so than at base of antenna. Wings wider than in S. urticae.

97. *Spilosoma mandli* Schawerda, 1922

(Pl. 19, Fig. 10)

*S. mandli* Schawerda, 1922: 11, TL: Nikolsk-Ussuriyskiy (Ussuriysk).

[= sangaica Walker, 1865]

Drautd, 1931: 81, pl. 7, row b, Spilosoma mandli

Dubatolov, 1996b: 66, Spilosoma urticae mandli

Description (after Draudt, 1931). Male similar to female of *lubricipedum* (= menthastri). Antennae entirely white, crests much shorter than in *lubricipedum*, but longer than in *urticae*. Fw narrower, in basal field with four black
strokes, not points. Middle series of black spots forming an acute angle directed outside. Further a point-like dashed series forming an almost straight row. At apex, three short strokes, middle of external edge with three smaller strokes. Fringe white. Hw white, often in the middle with a black stroke. Abdomen ochre yellow, with two series of black maculae.

“From Nikolsk-Ussuriyskiy, but seemingly ubiquitous as found also in Hungary (Igló), ignored only because of its resemblance to similar species” (Draudt, 1931: 81). However, we believe that Hungary is actually populated by one of the variations of *S. lubricipedum* or *S. urticae*.

**Distribution.** Pattern East Asian.
Within the former Soviet Union. Nikolsk-Ussuriyskiy, lower flow region of Amur River; Primorye.
Beyond the former Soviet Union. Unknown.

:**Note.** Dubatolov (1996b) considers *S. mandli* as an East Asian subspecies of *S. urticae*. However, based on available material, Primorye also supports populations indistinguishable from the European *S. urticae*. *S. mandli* being uncommon, its rank of an independent species is indeed to be questioned.

**Similar species.** *S. lubricipedum*, *S. urticae* (see key).

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### 98. *Spilosoma streltsovi* Dubatolov, 1996


*[streltsovi – in honour of A. N. Streltsov, an entomologist from Blagoveshchensk]*

**Description.** Alar expanse of male 37-38 mm, of female up to 43 mm. Antennae of male uniformly black, long, only slightly shorter than cell. Fore femur yellow, middle and hind femora white. Tibiae white, on upper side with a contrastingly black stroke, tarsi black. Abdominal segments yellow with a series of black spots on dorsal and both lateral sides each. Sternites whitish. Traces of two series of black spots visible only in female. Male fw opaque, in female semi-transparent, white with small black maculae. Fw with a basal and a subbasal spot at costal edge; one more, if noticeable, and still another behind medial vein. Two or three anteromedial spots at costa; sometimes one or more spots added in the middle of first vein. Female with an anteromedial spot more proximally of vein Cu2. Discoidal vein with two black points. Subterminal series in most cases variable but always with a longitudinal strip between veins M1 and M2. Terminal spots missing. Hw with a black spot at fore angle of cell and usually three subterminal spots, occasionally an additional spot near vein 1b.

According to the original description by Dubatolov (1996b), “There are additional distinctive characters: *S. streltsovi* has longer and black antennae, evenly black tarsi and black dorsal striae on the hind tibiae, and it lacks terminal spots on the wings. On the contrary, *S. lubricipedum* has shorter antennae, no more than 2/3 of cell length, coated with black and white scales, white tarsi, sometimes with an incomplete black dorsal stripe; the black terminal dots on the fws are often visible in the Far Eastern specimens. By these characters, as well as the valve shape, *S. streltzovi* sp. n. resembles most the Chinese *S. mienshanica* Daniel, 1943, but differs by a smaller size, a white thorax and a yellow abdomen. *S. mienshanica* Daniel is larger, wing expanse being 41-44 mm in males and 48-49 mm in females, the thorax is cream-white, the abdomen is red. Unfortunately, F. Daniel showed only a male valve, so it is impossible to compare the entire genitalia of both species.”

**Distribution.** Pattern East Asian.
Within the former Soviet Union. Amurland, Primorye.
Beyond the former Soviet Union. Unknown.

**Biology.** Flight since spring prior to the beginning of summer in forested regions.

**Similar species.** *S. lubricipedum*, has shorter antennae which are not more than 2/3 as long as the central cell, a different pattern of the fw, with black spots in cell 5, between veins M3 and M2, always placed only along veins, and a slightly different genitalic structure.

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### *Spilosoma album* Bremer & Grey, 1853

(*Pl. 24, Fig. 7)*

*Spilosoma album* Bremer & Grey, 1853: 61, TL: NE. China.

[= *rubidus* Leech, 1890; *leucoptera* Alpheraky, 1897]
Description. Differs by snow-white fw and hw (with 2-3 dark spots on hw). Abdomen with a bright red upper side and a white underside. Rows of black points on each lateral side.

Distribution. Pattern Manchurian.

Within the former Soviet Union. This species has not been recorded in Russia. However, since *S. album* occurs in Korea and China quite close to the eastern borders of Russia, one may expect its presence in the southern Primorye as well.

Beyond the former Soviet Union. Northeastern China; Korea.

48. Genus *Spilarctia* Butler, 1875

*Spilarctia* Butler, 1875: 39, TS: *Phalaena lutea* Hüfnagel, 1766.

Antennae of males pinnate, of females simple. Radial veins R2–R4 of fw running from apex of cell on common pedicel. Fw usually with black points, more rarely with transverse bands, e.g. in the Japanese *S. bifasciata* Butler, 1881 (Pl. 20, Fig. 12). Abdomen with five series of black spots. Male genitalia: valva usually narrow, weakly curved, with one or several processes at ventral edge. Uncus rostral.

Key to our species of *Spilarctia*:
1. Abdomen from above yellow. Antennae of male two-combed. Colour of fw and hw yellowish, not bright. .... *S. lutea*  
   –. Abdomen from above red or orange. ............................................................................................................ 2
2. Antennae of male bipectinate. ................................................................................................. 3
   –. Antennae of male serrate. Fw white or only slightly with yellowish tint. .......................................................... *S. subcarnea*
3. A black stria 5-6 mm long running from base of fw along costal edge. On underside of fw, inner border of fw darkened or black. .......................................................... *S. seriatopunctata*
   –. On underside of fw, inner edge not infuscate. .................................................................. *S. obliquizonata*

99. *Spilarctia lutea* (Hüfnagel, 1766)

(Pl. 20, Figs 4–11)

*Phalaena lutea* Hüfnagel, 1766: 182, pl. 381, fig. F, TL: Europe.

 [= *s radiatus* (Haworth, 1812); *rhodosoma* Turati, 1907; *corpusrufum* Hoffmeyer, 1960; *reisseri* Koutsaitikis, 1973]

[lutea – yellow (Lat.)]
[Buf Ermine – (Engl.)]
[Gelbe Tigermotte – (Germ.)]
[Ecaille Pied de Lièvre – (Fr.)]

Kirby, 1892: 228, *Diacrisia lutea*
Hampson, 1901: 258, 278, *Diacrisia lutea*
Hampson, 1920: 375, *Diacrisia lutea*
Kôda, 1988: 67, figs 102, 107, 118, *Spilarctia lutea*
Fang, 2000: 447, fig. 32 (genitalia), pl. XVIII, fig. 9, *Spilarctia lutea*

Description. Alar expanse 33-36 mm. Wings of male yellowish, of female paler. Upper side of fw with small black spots at costal edge and with a series of small points passing from apex of wing to the middle of inner edge. Two points at hind edge of fw most expressed. Hw with a black point on discoidal vein and sometimes with an additional point near hind angle. Underside with points on discoidal vein of fw and hw, and with an oblique stria in the centre of wing running from apex of fw to the middle of inner edge. Upper side of abdomen dark yellow with black points. Underside lighter. Lateral side with black points.
Variability considerable.

The following forms are known:
- f. zatima (Stoll, 1781) (Pl. 20, Fig. 7) – originally described from Helgoland Island, Germany; a very dark form with a brown background of wings, yellowish pollination on veins and in the centre of fw;
- f. frisia Müller, 1926 – dark fw combined with a light body;
- f. deschangeli Depuset, 1886 – almost uniform, with brown wings and thin clarified veins;
- f. totinigra Seitz, 1910 – melanist;
- f. unicolor Homberg, 1907 – also almost uniform pale without spots;
- ab. hipperti Lamber, 1906 (male) – quite pale like females;
- ab. paupera (Hoffman, 1911) – females without spots on hw.

There are numerous other infrasubspecific categories within this species. Among these one East Asian deserves special mention.

- f. japonica (Rothschild, 1910) – based on about 30 specimens from the Primorye available to us, this form, though described originally as a subspecies, fails to show significant differences from the European typical form.

Distribution. Pattern Palaearctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine, Crimea; Moldova; European Russia from southern Karelia and Kotlas in the north to West Caucasus (Maikop) in the south; Transeucasia (western Georgia); South Siberia

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Fig. 81. Russia, Primorye, Far Eastern “taiga” forest supporting Spilarctia subcarnea (Walker), S. seriatopunctata (Motsch.), Lemyra jankowskii (Oh.), Phragmatobia amurensis Seitz, Epatolmis lucifera (Den. & Schiff.) and some other tiger moths (photo V. S. Murzin).
from Kurgan, Tobolsk, Tomsk, Krasnoyarsk, and Irkutsk to northern Kazakhstan and Altai; Middle Amurland; Primorye; Sakhalin; southern Kuril Islands (Urup, Kunashir); perhaps absent from Transbaikalia.

Beyond the former Soviet Union. Europe from southern Scandinavia in the north to Spain in the south; northern part of Asia Minor; China (Dunbei, Hebei, Shaanxi); Korea; main Japanese Islands (Hokkaido, Honshu, Shikoku, Kyushu).


**Similar species.** *S. seriatopunctata*, the fw has a black stria at the costal edge at base on the upper side and a black inner edge on the underside. *S. obliquizonata*, has an expressed transverse belt on the fw.

### 100. Spilarctia seriatopunctata (Motschulsky, 1861)

(Pl. 21, Figs 6-11; genitalia in Pl. 27, Fig. 8)


[= *striato-punctata* Oberthür, 1879; *ione* Butler, 1875]

[seriatopunctata – points serially distributed (Lat.)]

Swinhoe, 1892: 183, *Spilarctia seriatopunctata*

Hampson, 1901: 285, *Spilarctia seriatopunctata*

Seitz, 1913: 85, pl. 15, row c, *Spilarctia seriatopunctata*

Daniel, 1943: 702, *Spilarctia seriatopunctata*

Fang, 1982: 216, fig. 1599, *Spilarctia seriatopunctata*

Fang, 2000: 435, pl. 17, fig. 20, *Spilarctia seriatopunctata*

**Description** (based on material from Primorye). Alar expanse of male about 40 mm, of female larger, up to 48 mm. Main component of wing colour yellow. Fw with a black stria 4 mm in length running from base of wing along costal edge. A chain of black points from apex to hind edge of fw, near hind edge these a little larger, in the middle of wing absent. This chain reaching the hind edge at 2/3 fw length from base. A dark stria on underside of fw beneath this chain of spots translucent from above. Upper side of hw with or without several black points. Underside of fw with a black spot on discal vein, an oblique black stria extended from apex of wing to its hind edge, and a wide dark band along hind edge. Central part of wing pink. Hw with a black point on discal vein. Abdomen from above red, underside white, with a series of black points at border between red and white. Thorax yellow, fore legs partly pink.

**Variability** modest:

ab. *flexomaculosa* Kardakoff, 1928 – Narva Island, environs of Vladivostok, Primorye; three black points near base of fw under a longitudinal stria, one more black spot at the end of cell, hw with a clear spot.

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Fig. 82. Valvae of *Spilarctia casigneta* (Kollar) (1) and *S. seriatopunctata* (Motsch.) (2).
Within the former Soviet Union. Middle Amurland, Primorye, southern Sakhalin, Southern Kuril Islands (from Urup to Kunashir).
Beyond the former Soviet Union. Korea (Singpo); Japan (Hokkaido, Honshu, Shikoku, Kyushu, Tsushima, Yaku, Amami, Okinawa); China (Heilongjiang, Jilin, Fujian, Sichuan).

Biology. Flight in July in woodlands.

Note. This species has often (e.g. Seitz, 1910; Konovalova & Volkova, 1970) been treated as a subspecies of S. casigneta (Kollar, 1844), the latter taxon originally described from Kashmir (Pl. 21, Fig. 12) (= striatopunctata Oberthür, 1879; sanguinalis Moore, 1879b; sagittifera Moore, 1879). However, the male genitalia show considerable differences (Fig. 82; Pl. 27, Fig. 7). Therefore, S. seriatopunctata (Motschulsky) is to be considered as a separate species.

Similar species. S. lutea, has a yellow abdomen; the fw is without black costal stria.

101. Spilarctia obliquizonata (Miyaki, 1910)

(Pl. 21, Fig. 3)

Diacrissa obliquizonata Miyaki, 1910: 208, TL: Japan.

[obliquizonata – obliquelly zonate (Lat.)]

Esaki et al., 1971: 213, pl. 122, fig. 2587, Spilarctia obliquizonata
Fang, 1982: 216, fig. 1599, Spilarctia obliquizonata
Fang, 2000: 435, pl. 17, fig. 20, Spilarctia obliquizonata

Description. Alar expanse reaching 42 mm. Main colour of wing, head and thorax creamy white. Costal edge of fw with two black striae, a gradually expanding black band divided by light veins running from apex of wing to the middle of hind edge. Hw with a black spot on discal vein and several submarginal spots. Abdomen pink with a series of black points laterally.

Variability. No data available.

Distribution. Pattern East Asian.
Within the former Soviet Union. Southern Kuril Islands (Kunashir), southern Sakhalin.
Beyond the former Soviet Union. Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Biology. Flight in July in woodlands.

Similar species. S. lutea, has a yellow abdomen, the black pattern is weakly expressed.

102. Spilarctia subcarnea (Walker, 1855)

(Pl. 21, Figs 1-2)

Spilosoma subcarnea (sic!) Walker, 1855: 675, TL: Shanghai, China.
[= leucothorax (Felder, 1862); bifrons (Walker, 1855); erubescens Moore, 1877; tsingtauana Rothschild, 1910; charbini Daniel, 1943]

[subcarnea – nearly solid (Lat.)]

Butler, 1877: 6, pl. 42, fig. 8, Spilarctia subcarnea
Hampson, 1901: 314, Diacrissa subcarnea
Seitz, 1910: 86, pl. 15, row d, Spilarctia subcarnea
Daniel, 1943b: 694, Spilarctia subcarnea
Daniel, 1943b: 696, pl. 19, figs 7-8, Spilarctia subcarnea charbini
Fang, 1982: 218, fig. 1613, Spilarctia subcarnea
Fang, 2000: 426, pl. 17, fig. 11, Spilarctia subcarnea
Dubatolov, 1996b: 68, Spilarctia subcarnea f. leuca
**Description.** Alar expanse about 40 mm. Fw white with slight yellowish tint; hw white. Fw with an arcuate series of black spots running from the middle of hind edge to external edge, the spots not reaching the latter. Spots at costal edge and on discoidal vein, sometimes also a series of spots near base. Hw with a weakly expressed dot on discal vein. Underside of wings white with black points on discal veins and with traces of an arcuate series on fw. Thorax and first abdominal segments white. Abdomen from above carmine red, underside white. A series of black spots on dorsal side and at border between red and white on each lateral side. In addition, a series of black points passing over white field on each lateral side. Antennae of male serrate.

**Variability** rather pronounced:
- f. *bifrons* (Walker, 1855) – Japan; hw pink, fw without black pattern;
- f. *lidia* – southern Primorye (Kaimanovka); abdomen yellow;
- ssp. *charbini* – NE. China; abdomen yellow. Kurentsov (1966) has recorded *charbini* in Kamchatka but Dubatolov (1996b) doubts the occurrence of this form in our country.

**Distribution.** Pattern East and Southeast Asian.
- Within the former Soviet Union. Primorye (Kaimanovka, Khasan).
- Beyond the former Soviet Union. China (Hongkong, Hubei, Siehuan, Beijjing, Shanghai, Taiwan, Heilongjiang, Guangdong, Yunnan, Shaanxi (Hauzenhi) etc.); Japan; Korea (Singpo) and other parts of Asia down to the Malay Archipelago and the Philippines.

**Biology.** Flight in August over glades of mixed and deciduous woodlands.

**Similar species.** *S. lutea*, has a yellow abdomen; the antennae of *S. obliquizonata* are bipectinate.

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**49. Genus Lemyra Walker, 1856**


= *Thanatarctia* Butler, 1877: 395, TS: *Thanatarctia infernalis* Butler, 1877

Thomas, 1990: 1. *Lemyra*

Fang, 2000: 526, *Lemyra*


**Note.** Thomas (1990) has provided a revision of the genus while Fang (2000) a key to most of the congeners.

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**103. Lemyra boghaika Tshistjakov & Kishida, 1994**

*(Pl. 21, Fig. 5)*

*Lemyra boghaika* Tshistjakov & Kishida, 1994: 189, figs 1-2, 3-4, TL: southern Primorye.


Dubatolov, 1996b: 68, *Lemyra inaequalis*

**Description.** Male. Alar expanse 32-35 mm. Fw from above white, with a dark diagonal band consisting of separate spots and running from apex of wing to middle of hind edge. A dark spot on discal vein present. Fw with a black dot at costal edge almost in the middle. Hind half of hw with pinkish tint. A black spot at apex of cell and several black maculae closer to edge of hw. Head and thorax pale creamy, abdomen from above pink.

Female. Alar expanse 40-44 mm. Wings, head and thorax white. Several longitudinal black strips at apex of *fw*, black spots at apex of cell on *fw* and *hw*. In addition, several dark spots located near external edge of *hw*. Abdomen yellow with black points on upper side, but last segments of abdomen remaining white.

**Distribution.** Pattern East Asian.
- Within the former Soviet Union. Lower Amurland, Primorye.
- Beyond the former Soviet Union. Korea; NE. China; Japan.

**Biology.** Flight in July-August on glades in mixed and deciduous woodlands, including forested slopes.
Similar species. *Spilarctia seriatopunctata*, on the average larger, female creamy yellow. Male has a black point near the base of the fw; along the costal vein there is a black strip running from the base. *S. obliquizonata*, larger (alar expanse 43-50 mm); the diagonal band on the fw is wide; the costal vein of the fw with a prolate black spot near the apex of cell; a black stria at the base. *S. subcarnea*, the abdomen is red with black points.

Note. Dubatolov (1994, 1996b) misidentified the Russian records as belonging to *Lemyra inaequalis* (Butler, 1879). At present these are correctly referred to *L. boghaika*.

### 104. Lemyra jankowskii (Oberthür, 1881)

*(Pl. 22, Figs 1-2; genitalia in Pl. 27, Fig. 9)*

*Spilosoma jankowskii* Oberthür, 1881: 31, pl. 8, fig. 3, TL: Askold Island (Primorye).

**[= jankowskii korearctia** Bryk, 1948]

[jankowskii – in honour M. I. Jankowski, a landowner in the Far East of Russia who assisted many explorers]

Leech, 1899: 152, *Spilosoma jankowskii* var. soror

Seitz, 1910: 86, pl. 15, row c, *Spilarctia jankowskii*

Dubatolov, 1996b: 68, *Lemyra jankowskii*

Fang, 2000: 400, pl. 16, fig. 18, *Lemyra jankowskii*

**Subspecies:**

*L. j. soror* (Leech, 1899) **[= vialis** Oberthür, 1911].

**Description.** Alar expanse 35-40 mm. Fw and thorax yellow. A black point on discal vein. A gray stria divided into spots by yellow veins running from apex of wing to the middle of hind edge. Initial part of the stria near the apex consisting of small spots. Hw white with black points on discal vein and near anal angle. Underside of fw white with a yellowish apex, hw white. Pattern of underside same as on upper side. Abdomen from above red, underside yellowish with black spots at border between yellow and red parts. Antennae of male black, pectinate. Last segments of abdomen of female larger, white.

**Variability** noticeable:

ssp. *soror* (Leech, 1899) – China (Beijing, Sichuan, Tibet, Yunnan, Shaanxi); coloration of fw darker; spotty stria curved toward fore edge of wing, an additional gray spot near inner edge.

**Distribution.** Pattern Southeast Asian.

Within the former Soviet Union. Middle Amurland, Primorye.

Beyond the former Soviet Union. China; India (Sikkim, Assam).

**Biology.** Flight in mixed coniferous-deciduous forests in July-August, common. Last instar caterpillar black. Hairy integument consisting of a mixture of black and white hairs, seemingly gray. On lateral sides, each segment with up to three separate brown spots. Head brown, body with brown spots (Seitz, 1910).

**Similar species.** *L. boghaika*, has white wings, the crests of the antenna are short. *Spilarctia subcarnea*, has a black, contrasting, diagonal stria, the abdomen from above is with black points.

### 50. Genus Phragmatobia Stephens, 1828


All species of the same type. Fw uniformly brown or light brown, hw red with a dark edge or with separate dark spots. Male genitalia: uncus rather slender and nearly straight, costa narrow and long.

Several dozen species of this genus are currently known. The geographical range of *Phragmatobia* covers nearly all of the Palaearctic. In the fauna of former Soviet Union, three species have been registered.
Key to species of *Phragmatobia*:

1. A red spot on discal vein of fw. ................................................................................................................... *Ph. placida*
   - No red spot but only one or two black points on discal vein of fw. ................................................................. 2

2. Antennae of male simple. .......................................................................................................................... *Ph. fuliginosa*
   - Antennae of male pectinate. ......................................................................................................................... *Ph. amurensis*

### 105. *Phragmatobia fuliginosa* (Linnaeus, 1758)

*(Pl. 22, Figs 4–7, 10; Pl. 23, Figs 2, 3, 9, 10; genitalia in Pl. 27, Fig. 10)*

*Phalaena fuliginosa* Linnaeus, 1758: 509, TL: W. Germany (“West Gotha”).

[= *fervida* Staudinger, 1871; *meridionalis* Tutt, 1904; *lurida* Rothschild, 1910; *totirubra* Vorbrodt, 1914; *furcula* Bryk, 1923; *atropha* Bryk, 1923; *clara* Sibille, 1927; *krugeri* Rangnow, 1935; *obscura* Obraztsov, 1936; *ochracea* Zlotowzycki, 1948; *imhoffi* Stoecklin, 1959; *monticola* Daniel, 1970; *nacuri* Ebert, 1973]

[fuligo – soot (Lat.)]
[Rostbar, Zimtbär – (Germ.)]
[Ruby tiger – (Engl.)]
[Ecaile Cramoisie, Ecaile Fuligineuse – (Fr.)]

Staudinger, 1871: 59, *Spilosoma fuliginosa borealis*, *S. fuliginosa fervida*
Alpheraky, 1889: 84, *Spilosoma fuliginosa pulverulenta*
Spuler, 1910: 130, pl. 73, fig. 26, *Phragmatobia fuliginosa*
Seitz, 1910: 79, pl. 16, row b, *Phragmatobia fuliginosa*
Daniel, 1970: 9, *Phragmatobia fuliginosa taurica*
Lenek, 1966: 105, *Phragmatobia fuliginosa paghmani*
Fang, 2000: 353, pl. 15, fig. 6, *Phragmatobia fuliginosa*

**Subspecies:**

*Ph. f. borealis* (Staudinger, 1871)
*Ph. f. fervida* (Staudinger, 1871)
*Ph. f. pulverulenta* (Alpheraky, 1889) (= *pallida* Rothschild, 1910; *thibetia* Strand, 1919)
*Ph. f. paghmani* Lenek, 1966
*Ph. f. taurica* Daniel, 1970.

**Description.** Alar expanse 25-32 mm. Fw dark brown with a black point, either with two spots or with a stria on discal vein. Hw red with purple tint and two points on discal vein. A series of dark spots often merged into a boundary belt at edge of hw. Prothorax coated with velvety brown hairs; upper side and underside of abdomen dark, lateral sides red, tip of abdomen often reddish. Antennae of male simple.

Male genitalia: uncus regularly tapered toward apex, subtriangular; two processes opposite each other at apex of valve at its upper and inner edges; saccus rounded from above.

**Variability.** The following subspecies are known from our territory:

- **ssp. fuliginosa** – southern half of Europe, central and southern Russia, southern Urals, southern Siberia;
- **ssp. borealis** – boreal; hw almost completely dark, only inner edge still with a red background; in central Russia, for example near Moscow, specimens with completely dark hws or separate spots at the edge of the wings, as well as intermediate forms, are known to occur;
- **ssp. fervida** – southern Europe, Turkey, Transcaucasia; larger, with reddish, often clarified fws; hw bright red with small black spots at edge of wing; Groum-Gshimaïlo (1890) mentioned the presence of this form in the Pamirs, Central Asia;
- **ssp. taurica** – Caucasus (except for the northeastern part), Transcaucasia (except for Armenia); eastern Turkey, northern Iran; fw lighter;
- **ssp. pulverulenta** – differs by the larger size (30-37 mm), upper side of fw often light, yellow-brown, especially in eremic parts, in the mountains darker; two black points, sometimes vague or missing, at the end of median cell; hw red or pink with separate, small, black spots in submarginal region and two black points on transverse vein; abdomen red
with a series of black points of each lateral side; described based on material taken by N. M. Przewalsky in the region of Lake Lob-Nor in Tibet, China, southern Mongolia and probably also in the south of Central Asia; in any case, similar specimens occur in different parts of Central Asia;

ssp. *paghmani* (Pl. 22, Fig. 10; Pl. 23, Figs 2 & 3) – southwestern Transcaucasia, Central Asia, southern Kazakhstan, Afghanistan; fw lighter than in the typical form, hw red with small dark spots; possibly this form is just a junior synonym of *pulverulenta*.

Some other subspecies have been described from the western and southern Palaearctic as well as North America but they do not seem to occur in the territory of the former Soviet Union.

**Distribution.** Pattern Holarctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine, Crimea; Moldova; entire European part of Russia, Siberia, Caucasus; Transcaucasia, Central Asia, southern Kazakhstan.

Beyond the former Soviet Union. Europe, E. Turkey, Iraq (Shaqlava), northern Iran, Afghanistan, southern Mongolia, China (Xinjiang, Qinghai, Nei Mongolia) and North America.

**Biology.** In the south of the range, flight in two generations from early spring until autumn, in Tajikistan and Turkmenistan up to four (Stshetkin, 1960) from the end of March to the end of September; in more boreal parts (ssp. *borealis*) in one generation (May-June). Flying at night. Caterpillar gray-brown with reddish brown hairs and a black head. In the afternoon usually hiding under stones. Food plants: various grasses and bushes like *Salix repens*, *S. starkeana*, *S. phylicifolia*, *Polygonum* spp., *Ranunculus* spp., *Myosotis* spp., *Potentilla erecta*, *Rubus idaeus*, *Trifolium* spp., *Chamaenerion angustifolium*, *Calluna vulgaris*, *Vaccinium myrtillus*, *V. uliginosum*, *Andromeda polifolia*, *Plantago* spp., *Taraxacum vulgare*, *Linum* sp., *Cardia* spp., *Spalanzania* sp. Caterpillar hibernating, in Central Asia sometimes pupa hibernating. Pupa black in a gray-brown cocoon made of silk with hairs. Pupation in crevices of tree bark, among leaves etc.
Similar species. *Ph. amurensis*, male antennae are pectinate, genitalia different, distributed in Cisamuria and Primorye. *Ph. placida*, has a small red spot between two black points on the discal vein of the fw, distributed only in Transcaucasia and Central Asia.

106. *Phragmatobia amurensis* Seitz, 1910

(Pl. 23, Figs 4-8)

*Phragmatobia amurensis* Seitz, 1910: 79, pl. 16, row b, TL: Amur.

[ = *chosensis* Bryk, 1948]

Rothschild, 1910: 116, *Phragmatobia amurensis japonica*

Esaki et al., 1971: 209, pl. 121, fig. 1560, *Phragmatobia fuliginosa japonica*

Dubatolov, 1996b: 69, *Phragmatobia amurensis japonica*

Subspecies:

*Ph. a. japonica* Rothschild, 1910.

**Description.** Superficially not differing from *Ph. fuliginosa*. Alar expanse 25-32 mm. Fw brown with a black point on discal vein. Hw red with purple tint and two points on discal vein. A series of dark spots at edge of wing. Prothorax coated with velvety brown hairs, abdomen from above and on underside dark, lateral sides red. Tip of abdomen often reddish. Antennae of males pectinate. Uncus rostral, sharply narrowed toward apex. Processes at apex of valve merged and forming a plate on inner side of valve. Saceus pointed from above.

**Variability** noticeable:

ssp. *japonica* – Amurland, southern Sakhalin, southern Kuril Islands and Japan; differing by brown fws with gray pollination and by a wide submarginal belt on hw.

**Distribution.** Pattern East Asian.

Within the former Soviet Union. Primorye and Amurland, southern Sakhalin, southern Kuril Islands.

Beyond the former Soviet Union. Korea; Japan; China.

**Biology.** Flight in various habitats from June until August.

**Similar species.** *Ph. fuliginosa*, differs by genitalic conformation; the antennae of the male are simple. *Ph. placida*, has a red spot on the discal vein of the fw, not occurring in the Far East of Asia.

107. *Phragmatobia placida* (Frivaldzsky, 1835)

(Pl. 22, Figs 3, 8, 9, 11-12; Pl. 23, Fig. 1)

*Euprepia placida* Frivaldzsky, 1835: 271, pl. 7, fig. 5, TL: Southeastern Europe (?).

[placida – quiet (Lat.)]

Erschoff, 1874: 33, *Arctia placida*

Spuler, 1910: 130, pl. 73, fig. 26, *Phragmatobia placida*

Seitz, 1910: 79, pl. 16, row b, *Phragmatobia placida*

**Description.** Alar expanse 37-39 mm. Fw brown with two points on discal vein, a red dot often but not always lying between them. Furthermore, a pink red field at base of fw below cubital vein. Hw semi-transparent, pink with few small black spots at edge and with black points at end of discal cell. Fringe of fw brown, of hw pink. Abdomen from above red with a brown dorsal band. All femora red.

**Variability.** Specimens from Central Asia (Alaiskiy Mt. Range) show lighter fws. Red markings on the fw are weakly expressed. In some specimens, the fws from above have two black points instead of red and black (Erschoff, 1874). The fore edge of the hw is infuscate.

**Distribution.** Pattern Anatolian-Iranian.
Within the former Soviet Union. Ukraine (Kostjuk & Pljustsh, 1987), Armenia and Central Asia. Beyond the former Soviet Union. From ex-Yugoslavia to Turkey.

**Biology.** In Armenia, flight from the end of June up to early August. Caterpillar a little larger than in *Ph. fuliginosa*, dark, from red-brown to almost black; fascicles of hairs on dark warts of the same colours. Head deep brown or black. Larvae feeding on *Plantago, Taraxacum* etc. Most of caterpillars hibernating, moth emergence in the beginning of summer.

**Similar species.** *Ph. fuliginosa* and *Ph. amurensis*, no red point on discal vein of fw; the latter species does not occur together with *Ph. placida*.

### 51. Genus *Epatolmis* Butler, 1877


= *Arctinia* Eichwald 1830: 195, TS: *Phalaena caesarea* Goeze, 1781


#### 108. *Epatolmis luctifera* (Denis & Schiffermüller, 1775)

*Pl. 23, Figs 11-12*

*Bombyx luctifera* Denis & Schiffermüller, 1775: 54, TL: Europe (?).

[= *Phalaena caesarea* Goeze, 1781; *luctifera* Esper, 1784; *japonica* Walker 1865; *moerens* Butler, 1885]

[luctifera – carrying grief (?) (Lat.)]

caesarea – royal (Lat.), black and yellow being Habsburg’s colours]

[Trauerspinner, Kaiserbär – (Germ.)]

[Le Deuil – (Fr.)]

Spuler, 1910: 131, pl. 73, fig. 2, *Arctinia caesarea*
Seitz, 1910: 91, pl. 17, row b, *Arctinia caesarea*
Fang, 2000: 352, pl. 15, fig. 5, *Epatolmis caesarea*

**Description.** Alar expanse 31-34 mm. Fw brownish black, hw of same colour but with a yellow macula near anal angle. Underside with the same pattern. Head, thorax and inner part of abdomen as well as legs black. Abdomen yellow with black points on lateral sides and dorsally. Antennae of male pinnate. Proboscis abortive. Female smaller in size, coloration more saturated.

**Variability.** Individual variability insignificant:

*i. (ab.)* moerens – yellow macula at anal angle of hw absent, sometimes yellow tint covering all inner edge of hw.

**Distribution.** Pattern Palaearctic.

Within the former Soviet Union. Baltia; Belarus; Ukraine; Moldova; European part of Russia (from the line Luga, Leningrad Region – Kazan in the north, and Taganrog, Rostov-on-Don – Millerovo – Middle Volga region in the south), Transcaucasia (Borzomhi in Georgia and Gyanja (Kirovabad) in western Azerbaijan); South Siberia (Tobolsk, Barnaul, Khakassia, Minusinsk); southern coast of Lake Baikal; Transbaikalia; middle flow region of Amur River (Blagoveshchensk, Pashkovo); southern Primorye (Sikhote-Alin Mts).

Beyond the former Soviet Union. Central and South Europe (southern France, southern Germany, Austria, Czech Republic, Slovakia, northern Italy and northeastern Balkans); Asia Minor; northern China; Japan.

**Biology.** Flight in May-June, in the south in two generations. Caterpillar black-brown with a reddish dorsal strip and fascicles of black-brown hairs on black warts. In July-August, feeding on *Rubus, Plantago, Veronica*, *
Galium, Euphorbia, Stellaria, Hieracium, Atriplex, Cynoglossum. Pupa red-brown, shining; hibernating in a dark gray cocoon.

**Similar species.** There seem to be no similar species.

**Conclusions**

At present, in the territory of the former Soviet Union, no fewer than and 108 species from 51 genera of Arctiidae in the narrow sense are known to occur. However, further numerical changes are possible as a result of new discoveries and revisions. Three new forms of unknown but likely infra-specific status are described in this book, and some further nomenclatural remarks are given.

Most of our tiger moths prove to be polyphages, with Plantago, Taraxacum and Vaccinium spp. being the most preferred food plants for the caterpillars (Fig. 85).

The fauna appears to be quite diverse both due to the great territory and habitat diversity concerned and the group’s incipient euryoeky. Species populate the southern mountains and the coasts of boreal seas, the highest mountain peaks, steppe, desert, dry and wet subtropical habitats, relict forests along the Caspian Sea and the woodlands of the Russian Far East.

The greatest proportion of the fauna accounts for Central Asian species (about 30%). Further ca. 12% are contributed by East Asian taxa. Rather well-represented appear to be Siberian species partly penetrating into Europe, Mongolia, North America and other adjacent countries (about 20%). These elements are followed by species widely distributed all over the northern Palearctic (−10%). A noticeable contribution is provided by Mediterranean elements (4 species). There are also representatives of the Iranian, northern American, Chinese-Mongolian and other faunas.

The greatest number of endemic tiger moths occur in Central Asia and the Altai. Among these elements, the Central Asian Divarctia diva, Palearctia ferghana, P. erschoffi, P. dublitzkyi, P. grattiosa, P. gracilis, P. golbecki, P. rupicola, Oroncus alaicac, Acerbia seitzi, Chelis ferghana, Ch. tianshana, Tajigyna gansoni, the Altaian Chelis caecilia,
Palearctia mira, Holoarctia marinae, Dodia sezonoci as well as the extremely boreal Hyperborea czekanowskii, Arctia olschzangs, Pararcitia tundrana and some others are noteworthy. Not surprisingly, the species from the Russian Far East appear to be especially closely related to the faunas of China and Korea, as a rule. Rather mysterious remains the distribution of Borearctica menetriesi, a form quite rare in existing collections. This tiger moth species ranges from Finland in the west to China and Sakhalin in the east, occupying various habitats like forest glades, taiga stands, “goltsy”, taluses, etc. but everywhere uncommon.

As most of our endemic species have only been described over the past few decades, new exciting discoveries are to be expected in the field of tiger moth systematics, distribution, ecology and biology.

Acknowledgements

The author wishes to thank all colleagues who helped him in this work: A. Avalov, V. V. Dubatolov, V. A. Ganson, A. V. Sviridov, V. V. Sinyaev. Special gratitude goes to O. G. Gorbunov for a critical review of the manuscript and to S. I. Golovatch for the help in editing the manuscript. Pensoft Publishers is cordially thanked for publication.

Fig. 85. Distribution of main food plants between tiger moth species (see Add. IV-7).
### IV. Addenda

#### IV-1. Alphabetical List of Genera

<table>
<thead>
<tr>
<th></th>
<th>Genera</th>
<th>Authors and Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acerbia</td>
<td>Sotavalta, 1963</td>
</tr>
<tr>
<td>2</td>
<td>Aglomerpha</td>
<td>Köda, 1987</td>
</tr>
<tr>
<td>3</td>
<td>Alphaea</td>
<td>Walker, 1855</td>
</tr>
<tr>
<td>4</td>
<td>Amarrhyparia</td>
<td>Dubatolov, 1985</td>
</tr>
<tr>
<td>5</td>
<td>Andala</td>
<td>Walker, 1855</td>
</tr>
<tr>
<td>6</td>
<td>Arctia</td>
<td>Schrank, 1802</td>
</tr>
<tr>
<td>7</td>
<td>Axiopone</td>
<td>Ménétriès, 1842</td>
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<td>8</td>
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</tr>
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<td>Latreille, 1809</td>
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<tr>
<td>10</td>
<td>Carcinopyga</td>
<td>Felder, 1874</td>
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<tr>
<td>12</td>
<td>Chionaercta</td>
<td>Köda, 1888</td>
</tr>
<tr>
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<td>Coscinia Hübner</td>
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<tr>
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<tr>
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<td>Dodia Dyar</td>
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</tr>
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<td>Ferguson, 1984</td>
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<td>28</td>
<td>Hyperborea</td>
<td>Grum-Grshimalo, 1900</td>
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<td>29</td>
<td>Hyphantria</td>
<td>Harris, 1841</td>
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<td>1965</td>
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<td>38</td>
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<td>Phragmatobia Stephens</td>
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#### IV-2. Checklist of the Tiger Moths of the Former Soviet Union

The genera and species recorded in the former Soviet Union are numbered:

**Subfamily Callimorphinae**

1. Genus *Callimorpha* Latreille, 1809
   1. Callimorpha dominula (*Linnaeus, 1758*)
   2. Callimorpha philippi *Bartel, 1906*
2. Genus *Euplagia* Hübner, 1820
   3. Euplagia quadripunctaria (*Poda, 1761*)
   4. Euplagia splendidior (*Tams, 1922*)
   5. Eucallimorpha principalis (*Kollar, 1844*)
4. Genus *Cymbalophora* Rambür, 1866
   6. Cymbalophora rivularis (*Ménétriès, 1832*)
5. Genus *Carcinopyga* Felder, 1874
7. Carcinopyga lichenigera Felder, 1874
8. Carcinopyga proserpina (Staudinger, 1887)

7. Genus Axiopoena Ménétriès, 1842
10. Axiopoena maura (Eichwald, 1830)
11. Axiopoena karelini Ménétriès, 1863

8. Genus Tyria Hübner, 1819
12. Tyria jacobaeae (Linnaeus, 1758)

9. Genus Dodia Dyar, 1901
13. Dodia diaphana (Eversmann, 1848)
14. Dodia albertae Dyar, 1901
15. Dodia kononenkoi Tschistjakov & Lafontaine, 1984

10. Genus Epimydia Staudinger, 1892
17. Epimydia dialampra Staudinger, 1892

11. Genus Lacydes Walker, 1855
18. Lacydes spectabilis (Tauscher, 1806)

12. Genus Spiris Hübner, 1819
19. Spiris striata (Linnaeus, 1758)
20. Spiris bipunctata (Staudinger, 1892)

13. Genus Coscinia Hübner, 1819
21. Coscinia cribaria (Linnaeus, 1758)

14. Genus Utetheisa Hübner, 1819
22. Utetheisa pulchella (Linnaeus, 1758)

Subfamily Arctiinae
15. Genus Stauropolia Skalski, 1988
23. *Stavropolia nekrutenkoi Skalski, 1988

16. Genus Parasemia Hübner, 1820
24. Parasemia plantaginis (Linnaeus, 1758)

17. Genus Hyphoraia Hübner, 1820
25. Hyphoraia aulica (Linnaeus, 1758)

18. Genus Pararctia Sotavalta, 1965
26. Pararetia lapponica (Thunberg, 1791)
27. Pararetia lemniscata (Stichel., 1911)
28. Pararetia tundrana Tschistjakov, 1990

20. Genus Borearctia Dubatolov, 1984
29. Borearctia menetriesi (Eversmann, 1846)

30. Acerbia alpina (Quensel, 1802)
31. Acerbia seitzi (A. Bang-Haas, 1910)

22. Genus Platarctia Packard, 1864
32. Platarctia atropurpurea (O. Bang-Haas, 1927)

23. Genus Oroncus Seitz, 1910
33. Oroncus tancrei (Staudinger, 1887)
34. Oroncus urania (Püngeler, 1904)
35. Oroncus fasciata O. Bang-Haas, 1927
36. Oroncus alaica O. Bang-Haas, 1927

26. Genus Arectia Schrank, 1801
37. Arectia intercalaris (Eversmann, 1843)
38. Arectia ladakensis (O. Bang-Haas, 1927)
39. Arectia caja (Linnaeus, 1758)
40. Arectia flavia (Püngeler, 1779)
41. Arectia rueckbeili (Püngeler, 1901)
42. Arectia olschwangi Dubatolov, 1990
27. Genus *Epicallia* Hübner, 1820
   43. *Epicallia villica* (Linnaeus, 1758)

28. Genus *Eucharia* Hübner, 1820
   44. *Eucharia festiva* (Hübner, 1766)
   45. *Eucharia interrogationis* (Ménétrès, 1863)
   46. *Eucharia culoti* (Oberthür, 1912)

29. Genus *Pericallia* Hübner, 1820
   47. *Pericallia matronula* (Linnaeus, 1758)

Subfamily Micrarctiinae
   48. *Divarctia diva* (Staudinger, 1887)

32. Genus *Tancrea* Püngeler, 1898
   49. *Tancrea pardalina* Püngeler, 1898

33. Genus *Holoarctia* Ferguson, 1984
   50. *Holoarctia cervini* (Fallou, 1864)
   51. *Holoarctia marinae* Dubatolov, 1985
   52. *Holoarctia puengeleri* (O. Bang-Haas, 1927)

34. Genus *Palearctia* Ferguson, 1984
   53. *Palearctia* (Palearctia) mira Dubatolov & Tshistjakov, 1989
   54. *Palearctia* (Palearctia) glaphyra (Ewersmann, 1843)
   55. *Palearctia* (Palearctia) dublitzkyi (O. Bang-Haas, 1927)
   56. *Palearctia* (Palearctia) gratiosa (Grum-Gralshimalo, 1890)
   57. *Palearctia* (Palearctia) gracilis Dubatolov, 1996
   59. *Palearctia* (Palearctia) rupicaola Grom-Gralshimalo, 1890
   60. *Palearctia* (Palearctia) erschoffii (Alphrady, 1882)
   61. *Palearctia* (Palearctia) ferghana (Staudinger, 1887)
   62. *Palearctia* (Centrarctia) mongolica (Alphrady, 1888)
   63. *Palearctia* (Palearctia) saryesola de Freina, 1997

35. Genus *Sibirarctia* Dubatolov, 1987
   64. *Sibirarctia kindermanni* (Staudinger, 1867)
   65. *Sibirarctia buraetica* (O. Bang-Haas, 1927)

36. Genus *Chelis* Rambur, 1866
   66. *Chelis maculosa* (Gerning, 1780)
   67. *Chelis reticulata* (Christoph, 1887)
   68. *Chelis caecilia* (Kindermann, 1853)
   69. *Chelis dahurica* (Boisduval, 1832)
   70. *Chelis ferghana* Dubatolov, 1988
   71. *Chelis tianshana* Dubatolov, 1988

37. Genus *Grammia* Rambur, 1866
   72. *Grammia quenseli* (Paykull, 1793)
   73. *Grammia philippiana* Ferguson, 1985
   74. *Grammia turbans* (Christoph, 1892)

38. Genus *Hyperborea* Grom-Gralshimalo, 1899
   75. *Hyperborea czeckanowskii* Grom-Gralshimalo, 1899

39. Genus *Diacrisia* Hübner, 1819
   76. *Diacrisia sannio* (Linnaeus, 1758)
   77. *Diacrisia irene* Butler, 1881

40. Genus *Rhyparioides* Butler, 1877
   78. *Rhyparioides metelkanus* (Lederer, 1861)
   79. *Rhyparioides amurensis* (Bremer, 1861)
   80. *Rhyparioides nebulosa* Butler, 1877

41. Genus *Rhyparia* Hübner, 1820
   81. *Rhyparia purpurata* (Linnaeus, 1758)
42. Genus Amurrhyparia Dubatolov, 1985
   82. Amurrhyparia leopardinula (Strand, 1919)

Subfamily Spilosominae
44. Genus Ocnogyna Lederer, 1853
   83. Ocnogyna parasita (Hübner, 1790)
   84. Ocnogyna armena Staudinger, 1871

45. Genus Tajigyna Dubatolov, 1990
   85. Tajigyna gansoni Dubatolov, 1990

46. Genus Watsonarctia de Freina & Witt, 1984
   86. Watsonarctia desert (Bartel, 1902)

47. Genus Chionarctia Koda, 1988
   87. Chionarctia niveum (Ménétriès, 1859)

48. Genus Alphaea Walker, 1855
   88. Alphaea melanostigma (Erschoff, 1872)

49. Genus Andala Walker, 1855
   89. Andala guttata (Erschoff, 1874)
   90. Andala transversa (Moore, 1879)

50. Genus Hyphantria Harris, 1841
   91. Hyphantria cunea (Drury, 1773)

51. Genus Diaphora Stephens, 1827
   92. Diaphora mendica (Clerck, 1759)

52. Genus Eudiaphora Dubatolov, 1990
   93. Eudiaphora turensis (Erschoff, 1874)

53. Genus Spilosoma Curtis, 1825
   94. Spilosoma lubricopedum (Linnaeus, 1758)
   95. Spilosoma punctarum (Stoll, 1782)
   96. Spilosoma urticae (Esper, 1789)
   97. Spilosoma mandli Schaefer, 1922
   98. Spilosoma streltsovi Dubatolov, 1994

54. Genus Spilarctia (Butler, 1875)
   99. Spilarctia lutea (Hübner, 1766)
   100. Spilarctia seriopunctata (Motschulsky, 1861)
   101. Spilarctia obliquizonata (Miyake, 1910)
   102. Spilarctia subcarnea (Walker, 1855)

55. Genus Lemyra Walker, 1856
   103. Lemyra boghaika Tshistjakov & Kishida, 1994
   104. Lemyra jankowskii (Oberthür, 1881)

56. Genus Phragmatobia Stephens, 1828
   105. Phragmatobia fuliginosa (Linnaeus, 1758)
   106. Phragmatobia amurensis Seitz, 1910
   107. Phragmatobia placida (Pricadelsky, 1835)

58. Genus Epatolmis Butler, 1877
   108. Epatolmis luctifera (Denis & Schiffermüller, 1775)

IV-3. Geographical Dictionary (Within the Former Soviet Union)

Geographical names

Abkhazia
   Description and geographical position
   A republic of Georgia, on the E. coast of the Black Sea: ~43°N, 40-42°E.
   Subtropical and mountains.

Ai-Dere
   A village in the W. Kopet-Dagh Mts, Turkmenistan. Dry subtropical
   (pomegranate, walnut, fig trees etc., many endemic plants).

Aksu-Dzhebagly Nature Reserve
   A nature reserve at the turn of Ùgamskiy and Talasskiy Mt. ranges, W.
   Tian-Shan: 42°20’N, 70°36’E.
Aktash, Altai: A small town in Kurai Mts, 1700 m a.s.l.: 50°20’N, 87°53’E.

Alai Valley: A broad valley (8-22 km) situated between the Alai and Zaalaiskiy Mt. ranges at 3000 m a.s.l., Kyzyl-Su River. Steppe. In Kirghizia between Chinese and Tajikistan borders.

Alai, Alai Mt. Range (Kichik Alai): The mountain ranges bordering on Fergana Valley in the N. of Pamirs-Alai Mts, up to 6100 m a.s.l. Semidesert, feather-grass steppe, juniper woodlands, alpine meadows, elevations over 3000 m a.s.l.: ~39-41°N, 71-75°E.

Alai-Pamirs (Pamirs-Alai, Pamiro-Alai): Highlands north of the Pamirs, including Alai, Transalai, Turkestanskii, Hissarskiy, and Zeravshan Mt. ranges.

Aldan River: A confluent of Lena River in E. Siberia. Coniferous forests (taiga). The point of junction at ~63°28’N, 129°21’E.

Alexandrovskiy Mt. Range: See Kirghiz Alatoo Mts

Alma-Ata (Almaty): The former capital of Kazakhstan at the foothills of Zailiiskiy Alatau Mts, average elevation ca. 1000 m a.s.l., 43°16’N, 76°57’E.

Altai (Altais): Highlands in S. Siberia from 50°N until Mongolian border in the S. Numerous mountain ridges, plateaus, glaciers. Mountain ridges from 500 to 5000 m a.s.l. Lower parts taiga-clad, higher altitudes supporting alpine meadows, rocks, taluses, snow/glaciers.

Amu-Darya River: A river in Central Asia. The source is in the Pamirs (~37°N, 68°20’E), delta at ~44°N, 59°01’E. Deserts, semideserts, “tugai” woodlands (riverside thickets).

Amur, Amur Basin, Amurland: A river in E. Siberia. The basin is ca. 2,000,000 sq. km. The flow of the river lying from 48° up to 50°N, 120-140°E. Coniferous and mixed forests.

Angara River: A right tributary to Yenisey River, discharging in Lake Baikal, extent ca. 1800 km. The basin is ca. 500000 sq. km in area. Source: 51°51’N, 104°59’E, delta: 58°11’N, 93°E. Coniferous forests (pine, fir, larch, etc.).


Arkhangelsk, Arkhangelsk Region: Both a city and a region in the north of European Russia: 64°30’N, 40°40’E, taiga.

Armenia: A country in Transcaucasia. The capital is Yerevan: 40°08’N, 44°31’E. Formerly SSR Armenia.

Artybash: A settlement at the source of Biya River (Lake Teletskoe) (51°48’N, 87°15’E).

Astrakhan: A city in the delta of Volga River: 46°22’N, 48°E.

Avadkharo (Auadkhara): A highland (1900-2400 m a.s.l.) place on the southern slope of the Caucasus Major, Abkhazia. Fir and mixed forests, alpine meadows near Lake Ritsa.


Azov Sea: A sea in the south of European Russia. 46±1.7°N, 35-38°E. Banks steppe-clad.

Badhkyz: A nature reserve with a savanna-like landscape (steppe with Pistacia trees) in SE. Turkmenistan on the Turkmenistan-Afghan border, 36°N, 62°E.

Baikal: The largest lake in Siberia: 51°29’-55°46’N, over 600 km in extent. The lake is edged by mountain ranges supporting taiga woodlands.

Baikal area, Baikal region: Surroundings of Lake Baikal with shores and mountain ranges (Khamar-Daban, Barguzin, with elevations up to 3000 m a.s.l.). Rich mountain forests, mainly taiga.


Balkhan Major: See Great Balkhan Mts

Balkhash: A lake, partly salt, in NE. Kazakhstan. Deserts, semideserts (Semirechye region).

Baltic countries, Baltia: Lithuania, Latvia and Estonia, i.e. republics of the former Soviet Union on the E. coast of Baltic Sea (54-59°N, west of 28°E).

Barnaul region (Altai Region) An extensive territory in S. Siberia from the northern borders of Kazakhstan and the northern slopes of Altai Mts up to 54° N. Steppes, pine forests, mountain forests, taiga.

Bashkiria (Bashkortostan) A republic in the east of European Russia, including the southern part of Ural Mts and Belaya River Basin. The capital is Ufa: 54°42' N, 56° E.

Belaya River A river in the SW. Urals, a confluent of Kama River.

Belarus (Byelorussia) A republic in the former Soviet Union. The capital is Minsk: 53°54' N, 27°32' E. Formerly SSR Byelorussia. A region supporting mixed forests, alluvial ridges with pine woodlands and moors.

Bering Island The largest among the Commander Islands, off Kamchatka: 55°06' N, 166°30' E.

Beryozov A small town on Sosva River, in the lower flow of Ob River. North taiga. 64° N, 65° E.

Bilibino A settlement on Smaller Anuy River (~68°30' N 167° E) north of Anuykskiy Mt. Range. Light coniferous (larch) taiga; mountain tundra in the mountains.

Bishkek (formerly Frunze) The capital of Kirghizia (Kyrgyzstan): 42°54' N, 74°36' E.

Blagoveshehensk The capital of Amurskaya Region of the Russian Far East, middle flow of Amur River: 50°21' N, 127°30' E.

Bolshoi Balkhan See Great Balkhan Mts

Borzhomi A small town in Georgia, Transcaucasia: 41°50' N, 43°23' E. Rich fir and hardwood forests.

Brich-Mulla (Burchmulla) A village on the bank of Chatkal River (~41°25' N, 70°50' E).

Bryansk A city in central Russia: 53°14' N, 34°21' E. Large pine forests.

Carpathians A mountain country in the center of Europe. Within the former Soviet Union, in the W. Ukraine only, average elevations ca. 1000 m a.s.l., maximum 2600 m a.s.l. Mt. Hoverla (2058 m): 48°15' N, 24°30' E. Rich fir, beech, maple etc. forests.

Caspian Sea A vast sea lake at the E. border between Europe and Asia. The coasts support a variety of environments ranging from deserts/semideserts to Tertiary humid Hyrcan woods in the SW. and S. parts.

Caucasus A vast montane land in the south of European Russia (38°25' -47°15' N, 36°37' -50°22' E), lying between the Black and Caspian seas. The highest peak is Elbrus (> 6500 m a.s.l.). Vegetation very rich (6500 species of flowering plants alone). Beech, oak, softwood forests, alpine meadows, rocks, glaciers.

Central Asia See Middle Asia

Central Tian-Shan The part of Tian-Shan Mts between Lake Issyk Kul and Kokshaltau Mt. Range in the south, and between 74° E and 80° E.

Chany Lake A lake in Novosibirsk Region, W. Siberia: ~77° N, 54° E.

Chardzhou A city in Kara Kum Desert on the bank of Amu-Darya River: 39°03' N, 63°34' E.

Chatkal Mts (Chatkalskiy Mt. Range) A range of ~600 km in extent in the W. Tian-Shan (~41-42° N, 70-72° E), Kirghizia and Uzbekistan, elevations up to more than 4000 m a.s.l. Vegetation from lowland juniper or walnut-apple-pear forests to highland fir stands and alpine meadows.

Chimgan Mt. A peak in the western part of Chatkal Mts (h~4000 m a.s.l.). The type locality for many species of butterflies and moths.

Chita A city in Transbaikalia: 52° N, 113°28' E.

Chu Valley The valley of Chu River in the Tian-Shan. The source is in Terskey Alatau: 41°57' N, 76°37' E, the delta in Saumak-Kol Lake in Bet-Pak-Dala Desert (~ 45° N, 70° E). In summer, the river dries up to disappears in the sands. Deserts, semideserts, steppe (in the south).
Chukotka (Chukot Peninsula)
A vast area in the extreme NE. of Asia. Mainly tundra-clad low hills/mountains with groves of larch, poplar, willow, birch etc. along rivers.

Chulym River
A river in central Siberia (Tomsk Region), a confluent of Ob River: 57°17'N, 83°48'E.

Cisamuria
Same as Amurland.

Crimea (Krym)
A peninsula on the NE. coast of Black Sea, Ukraine. The central part is steppe-clad, the south part subtropical. The capital city is Simferopol: 44°56'N, 34°06'E.

Daghestan
A republic in the NE. part of the Caucasus. The capital city is Makhachkala on the NW. coast of Caspian Sea.

Dahuria
(See Transbaikalia).

Darvaz Mts
One of the mountain regions of the Western Pamirs (~38°45'N). In the east, adjacent to the Academy of Sciences Mt. Range. The extent is about 200 km, height up to 5500 m a.s.l. Vegetation: steppe, bushland, in the upper belt alpine meadows, rocks, taluses and glaciers.

Darvazskiy Mt. Range
A mountain range in the W. Pamirs at ca. 38°N and between ~70.5°E and 72°E. Elevations up to 6000 m a.s.l.

Derbent
A town on the W. coast of Caspian Sea in Daghestan: 42°N, 48°17'E.

Dzungarskiy Alatau Mts
A mountain land between Ilı River and Lake Ala Kol, mainly within Kazakhstan. Elevations up to 4400 m a.s.l. Lowlands supporting semideserts to steppe, midmontane belts fir and birch woodlands, the upper belts are alpine meadows, rocks, taluses (45°N, 79-82°E).

Dolon Pass
A pass on the road between Rybatchye and Naryn in central Tian-Shan, Kirghizia (h = 3300 m a.s.l.): 41°49'N, 75°46'E.

Don
A river in the S. of European Russia, flowing into the Azov Sea. The biggest city is near the delta: Rostov-on-Don (46°32'N, 39°44'E).

Dzhanybek
A settlement in a semidesert region of Kazakhstan lying between Volga and Ural rivers.

Estonia
A Baltic republic, the capital is Tallinn. Formerly SSR Estonia.

European Russia
The area lying between the borders of Russia with the Baltic countries, Belarus and the Ukraine in the W. and SW., with Transcaucasia and the Caspian Sea in the S., and the Urals in the E.

Evenkia
A national region in E. Siberia, lying on the Middle-Siberian Table-land (60-70°N, 90-105°E). Average elevations about 600 m a.s.l. Forests (taiga).

Far East
Russia’s Far East encompasses the territories lying E. of the Chita Region, i.e. E. of Siberia.

Fergana Valley (Ferghana)
A vast intermontane depression bordering on the Chatkalskiy and Kuraminskiy Mt. ranges in the N., and on the Alaikski and Turkestanskiy Mt. ranges in the S. The valley is ca. 300 km long (40°15'-41°15'N, 70-72°30'E). Heavily used for agriculture, with some central areas being deserts, partly salty. The slopes of the mountains are largely woody (walnut, apple, apricot, juniper, etc.).

Ferganskiy Mt. Range
One of the mountain ridges in central-southern Tian-Shan (from Naryn River to Alaikski Mt. Range (N. point: 40°32'N, 74°49'E, S. point: 41°29'N, 73°25'E). Elevations up to 5000 m a.s.l. The W. slopes are mostly woody, the E. steppe-clad.

Georgia
A country in W. Transcaucasia. The capital is Tbilisi (formerly Tiflis): 41°43'N, 44°49'E. Formerly SSR Georgia.

Gezgyadyk Mts
The W. part of Badhkyz Nature Reserve cut by deep ravines, Turkmenistan: 35°47'N, 61°35'E.

Great Balkhan Mts
An inselberg mountain system north of W. Kopet-Dagh Mts in W. Turkmenistan. Elevations up to 1880 m a.s.l. (39°38'N, 54°36'E). Rocks, deep canyons with barren vegetation (fig trees, juniper etc.).

Ganja (Gyandzha, Kirovabad)
A city in W. Azerbaijan: 40°39'N, 46°21'E.
Gydan
A mountain range in E. Siberia (Kolyma Mt. Ridge), situated between Yama River in the south up to Bolshoy Anuy River in the north. (~ 1000 km), at ca. 64°N, 162°E in the central parts.

Hissar Mts (Hissarskiy Mt. Range)
A mountain ridge in the Pamirs-Alai, extent ca. 450 km, in latitudinal direction ~39°N, 67-70°E, elevations over 5000 m a.s.l.

Ichinskaya Sopka Mt.
Volcanic mountains in central Kamechatka. (3621 m a.s.l.): 55°41′N, 157°43′E.

Igarka
A city in Polar Siberia: 67°35′N, 86°35′E.

Ili River
A river starting at the junction of Tekes and Kungess rivers in China and flows into Lake Balkhash (~45°N, 75°E) in Kazakhstan. Semidesert, desert, “tugai” riverside thickets.

Irkutsk, Irkutsk Region
A large city and a region in the Lake Baikal area: 52°16′N, 104°20′E. Taiga.

Issyk Lake
A small lake on the northern slopes of Zailiiskiy Alatau Mts, Kazakhstan. (1780 m a.s.l.). Coniferous forest.

Issyk-Kul Lake
The largest lake in central Tian-Shan (1600 m a.s.l.), enclosed by mountains, in the north by Kungey Alatau, in the south by Terskey Alatau: 42°09′-42°41′N, 76°15′-78°20′E. Forests on the N. side of the lake, steppe and semideserts on the S. side.

Kaluga
A city in central Russia: 54°32′N, 36°19′E.

Kama River
The largest tributary of Volga River, delta at 55°10′N, 49°19′E.

Kamchatka
A vast mountainous peninsula with numerous volcanoes in the extreme NE. part of Asia, from north to south ca. 1200 km (51-62°N). The N. parts supporting mossy tundra, the central taiga-clad and with birch woodlands, elevated parts with alder and pine elfin woodlands and alpine meadows.

Kanin Peninsula
A peninsula in N. European Russia (67-68.5°N, 44-46°E). Tundra (partly bushy), moors, lakes.

Kara-Kala
A settlement in the W. Kopet-Dagh Mts. Semidesert, oases at foothills.

Kara-Kum Desert
The largest desert in the territory of the former Soviet Union, lying in Turkmenistan. Numerous ephemerooids, Haloxylon, etc. The centre of the desert is at ca. ~ 40°N, 60°E.

Karasuk
A small town in the Novosibirsk Region, SW. Siberia: 52°53′N, 77°E. Steppe.

Karelia
A republic in NW. Russia, in the W. it borders on Finland, in the N. on the Kola Peninsula, in the S. on the Leningrad Region. The capital is Petrozavodsk: 61°46′N, 34°20′E.

Karzhantau Mts
Mountains in NW. Tian Shan, ~ 42°N, 70°E, up to 2880 m a.s.l. Slopes are covered with couch-grass steppes, in deep valleys with forest, highlands with alpine meadows.

Kashkadaryinskaya Region
A region in S. Uzbekistan in the Kashka-Darya River Basin and in the W. spurs of the Pamirs-Alai. Desert, dry steppes. The capital is Karshi: 38°52′N, 65°47′E.

Kazakhstan
A huge republic in Central Asian, bordering on Russia in the N., mostly supporting steppe and forested steppe habitats, clayey and sandy deserts in the central parts; in the S. and SE., it includes the N. periphery of Tian-Shan as well as Dzhungarsky Alatau, Saur, Tarbagatay, and Altai mountains. The capital is Astana: 51°15′N, 71°26′E. Formerly SSR Kazakhstan.

Ket River
A river in W. Siberia, a tributary of Ob River. Length 1356 km: ~58°21′N, 82°30′E. Taiga and birch forests around.

Ketmen Mt. Range
An inselberg mountain system off N. Tian-Shan in SE. Kazakhstan (~ 43°20′N, 79°81′45′E), elevations up to 3500 m a.s.l. Slopes in the lower parts of the mountains are covered with steppe vegetation, valleys and highlands up to 3000 m a.s.l. with birch and spruce/fir forests.
Khabarovsky

A major city at the junction site of Amur and Ussuri rivers: 48°30′N, 135°15′E. Deciduous woods.

Khakassia

A republic in the W. part of Minusinskaya and Chulym-Yenisey depressions and on slopes of the Kuznetskiy Alatau and West Sayan Mts. Steppes dominating, in the E. and NE., covered with forested steppe vegetation, mountains taiga and tundra-clad. The capital is Abakan: 54°43′N, 91°28′E.

Khamar-Daban Mts

A mountain ridge on the S. and SE. coasts of Lake Baikal. Length ~ 300 km, elevations up to 2300 m a.s.l. (Sokhor Mt.: 51°17′N, 105°12′E). Slopes taiga-clad, lower places covered with forested steppe.

Khanty-Mansiisk

The capital of the Khanty-Mansiiskiy National Region, located on Irtysh River. The area largely supports taiga woodlands with birch, in the north both tundra and moors. Khanty-Mansiisk: 69°02′E, 60°58′N.

Kharkov

A large city in the E. Ukraine (~50°N, ~36°E). Agricultural landscapes, steppe, deciduous woodlands.

Khozratishokh Mts Range

A SW. extension of Darvaz M. Ridge, elevations 2800-4100 m a.s.l., 38°15′N, 70°11′E.

Kherson

A city in the S. Ukraine: 46°39′N, 32°38′E. Steppes.

Khibiny Mts

A mountain ridge in the Kola Peninsula, elevations up to 1200 m a.s.l. Woodlands in lower parts, mountain tundra at higher altitudes. Kirovsk: 67°37′N, 33°43′E.

Khorog

A capital town in the W. Pamirs: 37°26′N, 71°44′E, elevation ca. 2000 m a.s.l.

Khumsan

A town near Charvak Water Reservoir at the junction site of Pskem and Chatkal rivers: 41°42′N, 69°54′E.

Kirghiz Alatoo Mts (Kirghizskiy Alatoo, One of the north mountain ridges of W. Tian-Shan (42.5°N, 72-76°E), Kyrghizskiy Mt. Range, formerly Alexandrovskiy Mt. Range)

One of the north mountain ridges of W. Tian-Shan (42.5°N, 72-76°E), extent 375 km, elevations up to 4575 m. The following pattern of vertical belts from down to up: deserts, steppes, deciduous and juniper woodland, alpine meadows.

Kirghizia (Kyrgyzstan)

A republic in the Tian-Shan Mts, Central Asia. The capital is Bishkek. Formerly SSR Kirghizia.

Kirov (Vyatka)

A large, capital city situated on the bank of Vyatka River: 58°36′N, 49°30′E.

Koksu

A tributary to Karatal River in Dzhungarskiy Alatau Mts, E. Kazakhstan; delta at 44°21′N, 78°55′E. (NB: There are many rivers with the same name in Central Asia, meaning “a green river”).

Kola Peninsula

A peninsula in the extreme NW. of Russia, up to 70°N. The capital city is Murmansk. In the N., covered with tundra or forested tundra, in the S., taiga-clad.

Kolyma River

A river in NE. Siberia, discharging into the East Siberian Sea: ~ 69°20′N, 161°E. In the inferior flow region supporting tundra and forested tundra, in the S., taiga-clad.

Kolyvan

A small city at the N. foothills of Altai Mts: 51°20′N, 82°35′E.

Komi Republic

A vast republic in N. European Russia, lying between ca. 60-68°N. and 47-62°E. In the N., covered with bushy tundra turning first into forested tundra and then taiga towards the S.

Komsomolabad

A settlement on Vakhsh River: 38°40′N, 70°E, near the W. extremity of Peter-I Mt. Range, Tajikistan.

Kopet-Dagh Mts (Kopetdaghi Mts)

A mountain system lying in the S. of Turkmenistan along the border with Iran. Extent ca. 600 km, elevations up to 3000 m a.s.l. In the lower parts covered with deserts and semideserts, higher with steppe vegetation. In some valleys, rich woodlands (figs, maple, etc.), dry subtropics.

Koryakia

A national region in the N. of Kamchatka and adjacent continental parts. The capital is Palana: 59°N, 160°E. Pine-birch forests, tundra, moors, low mountains.
Kosh-Agach  A settlement in the S. Altai on Chuya River, Russia: −50°N, −88.5°E. Steppe.

Kotlas  A town on North Dvina River, Russia: 61°17’N, 46°31’E.

Krasnodar  A city in the N. Caucasus on Kuban River, Russia: 45°N, 39°E. Steppe.

Krasnovodsk  A port on the E. coast of the Caspian Sea, Turkmenistan: 40°N, 53°E. Deserts.

Krasnoyarsk  A large city in Central Siberia: 56°N, 92°54’E. Environs are taiga-clad.


Kulunda Steppe  A steppe area in the S. of West Siberian lowlands between 51 and 54°N, and between 75 and 84°E in the Barnaul region. Steppe, pineries, birch groves ("kolki").

Kum-Bell Pass  Turkestaniskiy Mts, elevations up to 3200 m a.s.l. Juniper woodlands, spiny-cushion (*Astragalus*) and sainfoin (*Esparcetus*)

Kungsiy Alatau Mt. Range  A mountain ridge on the N. coast of Lake Issyk-Kul, extended in latitudinal direction for ca. 280 km: −42°45’N. Elevations up to 4700 m a.s.l. Fir/spruce woodlands, alpine meadows, taluses.

Kurayskiy Mt. Range  One of the mountain ridges in the E. Altai: 88-89°E, 55°N (central part), extent −100 km, elevations up to 3500 m a.s.l. Taluses and alpine meadows at >2700 m a.s.l., lower with pine and larch taiga, and steppe vegetation.

Kurgan  A city in W. Siberia: 55°33’N, 65°20’E. Steppe, forested steppe, pine forests, birch groves ("kolki").

Kuril Islands (Kuriles)  A stretch of volcanic islands between Kamehatka and Hokkaido. The N. extremity: 50°56’N, 156°30’E; the S. extremity: 43°26’N, 145°24’E. Vegetation rich, about 1000 plant species, bamboo thickets, deciduous woodlands, open grasslands, etc.

Kushka  A small town in S. Turkmenistan: 35°11’N, 62°28’E.


Latvia  A Baltic republic on the E. coast of Baltic Sea. The capital is Riga: −57°N, 24°E. Formerly SSR Latvia.

Lena River, delta  The mouth region of a great Siberian river, representing a vast area of 30000 sq. km and 130 km in extent with a set of sleeves. The delta island is covered with peat bogs and tundra: 73°N, 125°E.

Lisichansk  A town on Severskiy Donets River, Ukraine: 48°51’N, 38°25’E.

Lithuania  A republic on the E. coast of Baltic Sea. The capital is Vilnius: −54°45’N, 25°18’E. Formerly SSR Lithuania.

Lower Volga region  The flow of Volga River lower than the mouth of Kama River: −55°N, 49°E. Deciduous woodlands, forested steppe, steppe.

Luga  A settlement in the Leningrad Region: 58°44’N, 29°51’E. Forests, moors.

Magadan region  A vast region in the Far East of Russia on the W. coast of the Sea of Okhotsk. The capital is Magadan: 59°40’N, 151°E. The N. parts largely supporting a tundra, the S. a taiga type vegetation.

Maidantal River  A river in the W. Tian-Shan; fusion of the Maidantal and Oigaing rivers (42°N, 70°40’E) gives rise to Pskem River.

Bolshye Kóty  A village in the central part of the W. bank of Lake Baikal, Siberia.

Merw (Mary)  A town in Turkmenistan in the S. Kara Kum Desert: −38°26’N, 62°E.

Mesen  A small town near the delta of Mesen River: 65°51’N, −44°E.

Middle Amurland  A region of Amur River flow from Blagoveschensk down to Khabarovsk (~1000 km).
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Asia (Central Asia)</td>
<td>A vast region including the deserts Kara-Kum and Kyzył-Kum, the mountain systems Kopet-Dagh, Pamirs, Tian-Shan, Pamirs-Alai, Khozarashkoh, and a number of other mountains largely within the former Soviet Union, partly also in Afghanistan and Iran.</td>
</tr>
<tr>
<td>Middle Ural</td>
<td>The part of the Ural Mts from 59°08'N down to 55°55'N.</td>
</tr>
<tr>
<td>Middle Volga region</td>
<td>The flow of Volga River between the mouth of Oka River (Nizhniy Novgorod) down to Samara. Forests and forested steppe.</td>
</tr>
<tr>
<td>Millerovo</td>
<td>A town in S. Russia: −48°52'N, 40°20'E.</td>
</tr>
<tr>
<td>Minusinsk</td>
<td>A town in S. Siberia: 53°43'N, 91°42'E.</td>
</tr>
<tr>
<td>Moldova (Moldavia)</td>
<td>A republic in the SW. of the former Soviet Union, lying between the Ukraine and Romania. The capital is Chisinau (formerly Kishinev): 47°N, 28°47'E. Formerly SSR Moldavia.</td>
</tr>
<tr>
<td>Moscow</td>
<td>The capital of Russia: 55°28'N, 37°19'E. Deciduous, pine and other forests, deciduous towards the S. of the Moscow Region.</td>
</tr>
<tr>
<td>Murmansk</td>
<td>A city in N. Russia (Kola Peninsula): 69°59'N, 33°E. Tundra.</td>
</tr>
<tr>
<td>Nakhichevan Republic (Nakhichevan)</td>
<td>An autonomous republic in Azerbaijan, bordering Armenia in the N., and both Iran and Turkey in the S. The capital is Nakhichevan: 39°12'N, 45°24'E.</td>
</tr>
<tr>
<td>Naryn</td>
<td>A small town in the Inner Tian-Shan, elevations ca. 2000 m a.s.l.: 41°23'N, 76°E.</td>
</tr>
<tr>
<td>Nerchinsk</td>
<td>A small city in the Chita Region, Siberia: 52°05'N, 117°E. Common birch groves, mountain steppe.</td>
</tr>
<tr>
<td>Nikolaev</td>
<td>A city in the S. Ukraine: 46°56'N, 32°E. Steppe, natural vegetation preserved only in ravines.</td>
</tr>
<tr>
<td>Nizhniy Novgorod (Gorkiy)</td>
<td>A city at the site of fusion of Volga and Oka rivers: 56°20'N, 44°E. Forests.</td>
</tr>
<tr>
<td>Nizhniyaya Tunguska River</td>
<td>A river in Siberia, tributary to Yenisey River, flowing across the Middle Siberian Table-land. Delta: ~66°N, 88°E.</td>
</tr>
<tr>
<td>North Kazakhstan</td>
<td>Steppe and forest-steppe parts of Kazakhstan N. of 51°N.</td>
</tr>
<tr>
<td>Northwest Caucasus</td>
<td>The part of the Caucasus Major lying W. of ~41°E.</td>
</tr>
<tr>
<td>Novoalexandrovka</td>
<td>A settlement in the Kherson Region of Ukraine. Steppe.</td>
</tr>
<tr>
<td>Novosibirsk</td>
<td>The largest city in W. Siberia, on Ob River: 55°N, 82°55'E.</td>
</tr>
<tr>
<td>Nuratau</td>
<td>Mountains lying N. of Samarkand: ~40°35'N, 66°50'E.</td>
</tr>
<tr>
<td>(Khanty-Mansiisk Region)</td>
<td>A city in the SW. Ukraine, a port on the Black Sea: 46°26'N, 30°44'E. Steppe.</td>
</tr>
<tr>
<td>Odessa</td>
<td>A plateau in Yakutia in the upper reaches of Indigirka River. Peaks reaching 1500 m a.s.l., canyons down to 700 m a.s.l. Lower parts taiga-clad, higher supporting a mountain tundra. The town of Oimyakon: 69°22'N, 141°E.</td>
</tr>
<tr>
<td>Olenek River</td>
<td>A river in Yakutia, originating in the Middle Siberian Table-land and discharging in the Laptev Sea. The town of Olenek: 68°45'N, 112°E.</td>
</tr>
<tr>
<td>Omsk</td>
<td>A city in W. Siberia: ~55°N, 73°20'.</td>
</tr>
<tr>
<td>Onon River</td>
<td>A river in S. Transbaikalia, one of the sources of Shilka River. Delta: 51°44'N, 115°09'E. Originating in Mongolia.</td>
</tr>
<tr>
<td>Ordubad</td>
<td>A small town in the Nakhichevan Republic, Azerbaijan: ~38°55'N, 46°E.</td>
</tr>
<tr>
<td>Orel</td>
<td>A city in central European Russia: ~53°N, 36°15'E.</td>
</tr>
<tr>
<td>Orenburg</td>
<td>A city in the S. Ural: 51°13'N, 55°E. Steppe.</td>
</tr>
<tr>
<td>Osh</td>
<td>A city in at the foot of Alaiskiy Mt. Range, elevation ca. 1000 m a.s.l.: 40°32'N, 72°49'E. Akbura River. Mountain steppe, rocks, deep canyon.</td>
</tr>
</tbody>
</table>
Pamirs
A high-montane land in SE. Central Asia, delimited in the N. by the Zaalayskiy Mt. Range (~39.5°N), in the E. by the Kashgarskiy Mt. Range, in the S. by the Hindu Kush, in the W. by the Pyanj River Valley. Some of the Pamirs lie also in the adjacent parts of China and Afghanistan. The E. Pamirs represent a high-montane plateau of 4000 m elevation, the W. Pamirs are cut by deep gorges and canyons. Large glaciers, rocks and taluses. The E. Pamirs are a high-montane desert, a snow cover only at elevations more than 6000 m a.s.l. In the W. Pamirs, the vegetation is richer, including woodlands.

Pamirs-Alai (Pamiro-Alai)
A conditional region comprising the Alaiskiy, Turkestanskiy, Zeravshanskiy, Hisarskiy Mt. ranges and their W. spurs.

Parkent
A town ~70 km E. of Tashkent, Uzbekistan. Steppe, bushes, rocks.

Pushkovo
A settlement in the middle flow region of Amur River.

Penza
A city on Volga River: 53°12’N, 45°E.

Peter-the-Great Mts (Peter-I Mt. Range)
A mountain ridge on the Central Pamirs, ca. 200 km in latitudinal direction: (39°N, 70°20’-72°E), restricted in the S. by the Surkhob River Valley. Elevations up to 7000 m a.s.l.

Petrovskiy Zavod
(Petrovsk Zabaikalskiy since 1926)
A city in the Chita Region, Transbaikalia: 51°17’N, 108°51’E.

Podkamennaya Tunguska River
A river in E. Siberia, tributary to Yenisey River. Delta: 61°32’N, 90°E.

Pogranichnyi (Grodekovo)
A settlement in the S. Primorye: 44°25’N, 131°48’E.

Pokrovka
A settlement in upper reaches of Amur River: 53°25’N, 121°35’E.

Polar Siberia
Siberia’s region supporting tundra and forest-tundra landscapes, N. of 67-70°N.

Polar Urals
The parts of the Urals N. of Khulga River: 65°37’N. Elevations up to 1500 m a.s.l. Tundra.

Polar Yakutia
The tundra belt of Yakutia, roughly N. of 69°N.

Polyarnyi Ural
A mountain range in the N. Urals. The central part is situated at the Polar Circle: ~64°E.

Poronay River
A river in the central part of Sakhalin Island, with moors in the valley, and larch forests in the mountains.

Primorye (Maritime Region)
The part of the Russian Far East lying S. of 48°N, very rich floristically and faunistically, with numerous Tertiary relicts.

Pskem
A river in the W. Tian-Shan between the Pskemskiy and Uganskiy Mt. ranges, tributary to Chatkal River, delta: 41°37’N, 70°05’E. The valley supports poplar, birch, juniper etc. wood- to bushlands.

Pskem Mts
A S. spur of Talasskiy Mt. Range, extent ~160 km, elevations over 4000 m: 42°N, 71°E.

Ryazan
A city in central Russia, 190 km SE. Of Moscow. Mixed forests.

Rostov-on-Don
A large city in the lower flow of Don River: 47°15’N, 39°45’E. Steppe.

Rushanskiy Mt. Range
A mountain range in the W. Pamirs N. of Khorog: ~37°30’N, 72°E. The highest peak is 6080 m a.s.l.

Sakhalin
A large island in the Far East of Russia, extent ca. 1000 km from N. to S.: ~142-143°E.

Samara
A large city on Volga River: 53°13’N, 50°09’E. Forested steppe and steppe.

Samarkand
An ancient city in Central Asia: 39°38’N, 66°59’E. Semidesert.

Saratov
A city on Volga River: 51°29’N, 46°E. Steppe.

Sarydzhal River (Saryjaz)
A river in the Central Tian-Shan. In China, the river is named Aksu. Sources in the glaciers of Khan-Tengry Peak: 42°10’N, 79°40’E.

Saur Mts
A minor mountain range at the border between Kazakhstan and China SE. of Lake Zaishan: 47°03’N, 85°25’E. The highest elevation ~3800 m a.s.l.

Sayan Mts
A vast mountainous land in S. Siberia, the highest peaks ~3500 m a.s.l. The Western Sayan lying between 89 and 96°E, the Eastern Sayan up to
ridge Khamar Daban in Transbaikalia (~103°E). A forest, lowlands and remote area by forest-steppe and steppe coat the mountains. At heights more than 2000 m a.s.l. the alpine pratums.


Semipalatinsk A city in NE. Kazakhstan: 50°26’N, 80°17’E.


Shakhdaryinskiy Mt. Range A mountain range in the W. Pamirs, lying between Shakhdara and Pyanj rivers: ~37°N, 72°E.

Shantarkiye Islands An archipelago in the Sea of Okhotsk. Major Shantar Is.: 55°N, 137°43’E.

Shugnanskiy Mt. Range A mountain range in the W. Pamirs: ~37°25’N, 72°E.

Siberia The parts of Russia lying between the Ural Mts and the Russian Far East, i.e. W. of the Amurskaya (Blagoveshchensk) Region.

Sikhote-Alin Mts A mountainous land in the extreme SE. of Russia’s Far East, lying mainly along the coasts of the Sea of Japan, extent ca. 1200 km, width up to 300 km. Elevations up to ca. 2000 m a.s.l. Climate monsoon. Mixed coniferous-deciduous and deciduous woodlands. The Sikhote-Alin Biosphere Nature Reserve: 45°16’N, 136°08’E.

Simbirsk (See Ulyanovsk).

Sochi A resort place in Russia, on the Black Sea coast, NW. Caucasus: 43°40’N, 39°50’E. Largely subtropical.

Sokhondo Nature Reserve The SE. part of Chita Region, Transbaikalia: 49°44’N, 111°06’E. Elevations up to 2500 m a.s.l. Slopes taiga-clad, higher altitudes tundra-clad.

Sormovo A suburb of Nizhniy Novgorod.

South Baltic countries Lithuania and Latvia, both the southern countries of the three Baltic republics of the former Soviet Union.

South Crimea The Black Sea coast of the Crimea lying S. of the mountain ridge. Mediterranean biota.

South Primorye The parts of the Primorye lying S. of 44°N.

South Siberia The parts of Siberia lying S. of the line Kurgan–Omsk–Novosibirsk, plain areas predominantly steppe and forested steppe in character, mountainous areas (Altais, Sayan, Tuva) largely taiga-clad.

South Transbaikalia The regions of Dahuria lying S. of the line Ulan-Ude – Chita.

South Turkmenistan The regions of Turkmenistan including the Kopet-Dagh Mts and the areas adjacent to the borders with Iran and Afghanistan.

South Urals The part of the Ural Mts lying between 51 and 57°N, i.e. between the upper reaches of Ufa River and the River Ural, the town of Orsk.

Southwest Siberia Steppe and forested steppe belts of Siberia S. of the line Kurgan–Novosibirsk.

Southern Karelia The parts of Karelia lying S of 63°N. Pine and fir woodlands dominating.

Southern Kuril Islands Kunashir, Iturup, Urup, Brouton, Black Brothers islands, all S. of Bussol Strait.

Southern Sakhalin Parts of Sakhalin Island S. of 51°20’N.

St.-Petersburg A large city in NW. Russia: 59°55’N, 30°20’E. (former Leningrad)

Stanovoy Mt. Range A mountain system ranging between the middle flow of Olekma River up to the source of Maya River, where it extends into the Dzhugdzhur (Jugjur) Mt. Range. Extent ~700 km in latitudinal direction: ca. 56°N, 120-132°E. Larch and spruce taiga forests, moors.

Stavropol A city in the N. Caucasus, Russia: 45°01’N, 42°E.

“Stolby” Nature Reserve A nature reserve near Krasnoyarsk: ~55°46’N, 93°46’E.

Suntar A settlement on Vilyui River, E. Siberia: 62°11’N, 117°41’E.

Susamyr Valley The valley of Susamyr River: ~42°11’N, 74°E. Steppe, bushlands.

Susamyr Mts A plateau/ridge in the W. Tian-Shan about 100 km in extent, elevations up to 4000 m a.s.l. Grassy and others steppe vegetation types: ~42°05’N, 73.5°E.
Svanetia
A region on the S. slopes of the Central Caucasus Major, Georgia.

Syktyvkar
The capital of Komi Republic: 61°51’N, 50°46’E.

Syr-Darya River

Taganrog
A town in S. Russia on the E. coast of Azov Sea: 47°13’N, 38°50’E.

Taimyr Peninsula

Tajikistan
One of the most high-montane republics of the former Soviet Union, largely lying in the Pamirs. The capital is Dushanbe: 38.5°N, 68-45°E. Diverse environments, dense varied vegetation. Formerly SSR Tajikistan.

Talasskiy Alatau Mts
A mountain range in the W. Tian-Shan: 42°15’N, 71-74°E. Average altitudes ca. 4000 m a.s.l., foothills covered with steppe vegetation with xerophilous bushes (dogrose, Berberis etc.), higher with alpine meadows.

Talgar River
A river in Trans-Ili Mts, habitats ranging from glaciers to steppe.

Tannuola, Tannu Ola
A mountain ridge in the S. of Tuva Republic, extent ca. 300 km, elevations up to 3000 m a.s.l. N. slopes covered with fir/pine taiga, S. slopes – steppe. At 2300 m a.s.l. and higher covered with taluses/montane tundra.

Tarbagatay Mt. Range

Tashkent
The capital of Uzbekistan: 41°18’N, 69°19’E.

Teberda
A resort place in the N. Caucasus, Russia: 43°25’N, 41°44’E. Elevations averaging 1300 m a.s.l.

Teletskoe Lake
A vast lake in the Altai: ~87°40’E, 51°50’N. Mostly birch forests and/or taiga-clad slopes with pine and fir, with numerous glades, at 2200 m a.s.l. and higher covered with taluses, subalpine and alpine meadows.

Terskey Alatoo
A vast ridge in the Central Tian-Shan, extending along the S. coast of Lake Issyk-Kul for ~380 km, elevations up to 5000 m a.s.l.: 42°N, 78°E.

Tian-Shan (Tien-Shan)
A huge mountain system in Central Asia, lying between 40-45°N and 67-95°E. Many of the N. slopes border on Ili River, the SW. border lies N. of Fergana Valley. Both Central and W. Tian-Shan lie within the former Soviet Union, the E. parts in China.

Tobolsk
A city in Siberia, on Irtysh River: 58°10’N, 68°16’E.

Tokko
A river in E. Siberia, tributary to Chara River. Sources on the N. slopes of Udokanskiy Mt. Range. The town of Tokko: 60°N, 120°E.

Toktogul
A settlement on the road Osh–Bishkek, Kirghizia: 41°53’N, 72°50’E.

Tomsk
A city in Siberia: 56°15’N, 85°E.

Torey
A settlement in S. Transbaikalia: 50°33’N, 104°49’E.

Trans-Alai (Transalai Mts, Zaalayskiy Mts)
One of the N. mountain ridges of the Pamirs. Elevations up to 7000 m a.s.l., delimited in the N. by the Alai Valley, basically latitudinal in direction: 39°20’N, 71.5-75°E.

Transbaikalia (Dahuria)
A region in E. Siberia lying E. of Lake Baikal.

Transcarpathia
A region of the W. Ukraine lying SW. of the Carpathians.

Trans-Ili Alatau, Trans Ili Mts.
See Zailiiskiy Alatau.

Tsv
A settlement in SE. Armenia: ~39°N, 46.5°E.

Tseyiskiy Gorge
In the N. Caucasus: ~42°48’N, 43°54’E.

Turkestanskiy Mt. Range
The N. range in the Pamirs-Alai, extending in latitudinal direction from 67 to 71°E at a latitude of 39°30’N.

Turkmenistan
A republic in SW. Central Asia. The capital is Ashkhabad: ~38°N, 58°20’E. Formerly SSR Turkmenia.

Tuva Republic
A republic in S. Siberia. The capital is Kyzyl: 51°43’N, 94°12’E.

Tver (Kalinin)
A city on Volga River: 56°51’N, 35°55’E. Largely taiga woodlands.

Tyumen
Ubsu-nur Lake
A closed lake on the border of Tuva Republic, Russia and Mongolia, elevation 760 m: 50°30'N, 93°E. Deserts.

Udokan Mt. Range
A ridge in Transbaikalia, extent ~300 km, elevations up to 2500 m a.s.l. Larch woods up to 1200 m a.s.l., higher elevations supporting tundra vegetation: 56°20'N, 117-119°E.

Ufa
A city on Belaya River, in the S. Urals: 54°49'N, 55°52'E. Forests.

Ukhta
A town in Komi Republic: 63°30'N, 53°55'E. Taiga.

Ukok
A plateau at 3000 m a.s.l. in the S. of Russia’s Altaias bordering on Mongolia. High-montane tundra.

Ukraine
A vast country in the S. of Eastern Europe down to the Black Sea. The capital is Kiev: ~50°15'N, 30°E. Formerly SSR Ukraine.

Ulan-Ude
A city in Transbaikalia: 51°49'N, 107°34'E. The capital of Buryatia (Buryat Republic).

Ulyanovsk
A city on Volga River: 54°17'N, 48°21'E.

Upper Kolyma region
The river originates from the junction of two sources, Kula and Ayaryakh (62°19'N, 147°44'E) in the Tas-Kystabyt Mts within the mountain taiga belt.

Upper Volga region
The Volga River flow from the source down to the mouth of Oka River at Nizhniy Novgorod: 56°20'N, 44°E.

Uralsk
A town in the upper reaches of Ural River.

Urup
A town in the upper reaches of Ural River.

Ust-Tsilsma
A settlement on Pechora River: 65°30'N, 52°E.

Uzbekistan
A large republic in Central Asia. The capital is Tashkent: 41°17'N, 69°17'E. Formerly SSR Uzbekistan.

Vakhsh
A river in the Pamirs, tributary of Pyanj River. Delta: 37°20'N, 68°19'E.

Vasilsursk
A town ca. 120 km E. of Nizhniy Novgorod on Volga River: ~56°N, 46°E.

Verkhoyanskiy Mt. Range
A mountain system in Yakutia, lying E of Lena River and consisting of several mountain ridges up to 200 km wide. Elevations up to 2000 m a.s.l., higher places supporting tundra, N. slopes forested tundra, S. slopes taiga vegetation. Verkhoyansk: ~67°40'N, 133°12'E.

Vilyui
A river in Yakutia, 2435 km long. The town of Vilyuisk: ~64°N, 121°20'E. The upper reaches are swampy, the lower flow with extensive larch taiga woodlands.

Volga River
The largest river in European Russia. The upper reaches are among woods, from the sources on the Valday Hills: ~57°13'N, 32.5°E, down to Nizhniy Novgorod. The middle flow down to the mouth of Kama River is likewise largely among woodlands. The lower flow runs among steppe and semidesert landscapes.

Volgodonsk
A town on the bank of Tsimlyanskoe Water Reservoir: 47°32'N, 42°E. Steppe.

Vologda
A city in central European Russia: 59°13'N, 40°E. Woodlands.

Vyatka
See Kirov.

West Georgia
The part of Georgia W. of 43°E.

West Pamirs
See Pamirs.

West Sayan Mts
See Sayan.

West Siberia
The part of Siberia lying between the Ural Mts and Yenisey River.

Wrangel Island
An island in the Arctic Ocean: ~71°N, 180°E. Lowlands and mountains (ca. 1000 m a.s.l.), tundra-clad.

Yablonoyi Mt. Range
A mountain ridge in Transbaikalia, extent ca. 1000 km, elevations up to 1800 m a.s.l. Serving as a watershed between the Pacific and Arctic oceans: 52.5°N, 114°E. Larch and fir-pine taiga.

Yakutia (Yakut-Sakha Republic), Yakutsk
A very large republic (ca. 2000 km from N. to S. and from E. to W.) in the N. and NE. of Asia, bordering on the Arctic Ocean. The area is largely taken up by mountains and table-lands, mostly taiga-clad but the N.
parts covered with tundra and forested tundra, rarely steppe. The capital is Yakutsk, situated on Lena River: ~62°N, 129°E.

Yamal Peninsula (Yamal) A peninsula in the N. of W. Siberia, ~700x200 km. The capital is Salekhard: 67°N, 68°E. Tundra, forested tundra, peat bogs.

Yana River A river in E. Siberia originating in the Verkhoyanskiy Mt. Range and discharging into the Laptev Sea. Length ca. 900 km. The capital is Verkhoyansk, on Yana River: ~67°40’N, 133°12’E.

Yenisey River A river on the border between W. and E. Siberia, one of the largest rivers in Russia and the entire world, originating in Tuva Republic. The largest city on the Yenisey is Krasnoyarsk: 56°N, 93°E.

Zaaminskiy Nature Reserve A nature reserve on the N. slope of Turkestankiy Mt. Range: ca. 39.5°N, 68°20’E.

Zailiiskiy (Trans-Ili) Alatau Mts A N. mountain range in the W. Tian-Shan, extent in latitudinal direction ca. 300 km: ~43°N, 76-79°E. Grasslands and bushlands (“prilavki”) with a belt of fruit trees at foothills and medium elevations, between 1700 and 3000 m a.s.l. fir/spruce woodlands, above them alpine meadows.

Zaisan Lake A lake in E. Kazakhstan at 380 m a.s.l.: ~48°N, 84°E. The coasts are covered with semidesert vegetation.

Zaporozhye Region A region in the S. Ukraine. The capital is Zaporozhye: 47°49’N, 35°15’E. Steppe, mostly under agricultural usage, islets of natural vegetation remaining on slopes of ravines and at margins of woodlands growing in flood-plains of rivers.

Zeravshanskiy Mt. Range A mountain range in the Pamirs-Alai: 39°15’N, 66.5-71°E. Elevations up to 5500 m a.s.l. Glaciers, rocks, taluses, mountain steppe, below agricultural fields.

Zeravshan River (Matcha) A river in Central Asia, extent more than 700 km, starting at 2800 m a.s.l. in the Koksu mountain knot: 39°25’N, 70°27’E.

IV-4. Tiger Moth Species Erroneously Included in Our Red Data Books


1. Palearctia (Centrarctia) mongolica (Alpheraky, 1888)

IV-5. Index of Infrasubspecific, Species- and Genus-Group Names of Tiger Moths

Boldface script refers to the genus- and species-group names considered as accepted/valid; regular script refers to presumed subspecies; italicised script refers to junior synonyms and/or presumed infrasubspecific categories.

A aegrotum, Utetheisa, 40
abraxoides, Utetheisa, 40
Acerbia, 5, 7, 12, 42, 52, 84, 111, 149
Afghanica, Oenogyna, 120
Acimba, 35
Afganica, Oenogyna, 120
Afghanistanensis, turensis, 130, 131
agassizi, matronula, 76, 77
Aglaomorpha, 5, 6, 21, 149
aksuensis, glaphyra, 85, 86
alaica, Orneoues, 56, 58, 147, 150
albertae, Dodia, 29-32, 34, 35, 111, 150
albida, striata, 37
albimaculata, flavia, 67
albipuncta, glaphyra, 86
album, Spilosoma, 132, 136, 137
allardi, Preparctia, 60
Alphaea, 5, 9, 126, 149
americana, caja, 65
Ammobiota, Eucharia, 71
amurensis, Rhyparioides, 116, 117, 151
amurensis, matronula, 76, 77
amurensis, Phragmatobia, 138, 143, 145, 146, 152
amuri, irene, 114
Amurrhyparia, 4, 5, 119, 149
anatolica, Ocnogyna, 120
Andala, 5, 7, 126, 127, 149
andresi, loewii, 121
angelica, villica, 70, 71
anglica, cricaria, 39
Antarctica, 132
antennata, Utetheisa, 40
apisistrigata, lubricepedum, 133
arabum, villica, 70
arafati, festiva, 72, 74
araitensis, plantaginis, 44, 46
arcana, erschoffi, 93, 94
Aretaia, 5-7, 12, 25, 36, 57, 60, 61, 65-70, 72, 75, 78,
artecia, diaphana, 31
Arctinia, Epatolmis, 146
arcuata, pulchella, 40
Ardisces, 132
Areas, 5
arenosa, parasita, 121
Argyna, 6
arizana, Eucallimorpha, 20
arkanzona, maculosa, 102
arragonensis, maculosa, 102
armena, Ocnogyna, 120, 122, 152
Atasca, 40
aterrima, striata, 37
Atlantaretia, 61
Atolmis, 146
atra, albertae, 31, 32
atropha, fuliginosa, 143
atropurpurea, Platarctia, 54, 55, 150
aulica, Hyphoraia, 46, 47, 48, 54, 150
aurantiaca, intercalaris, 62
auripennis, phaeosoma, 64
acia, lapponnaica, 49
Axiopoea, 1, 5, 8, 13, 26, 27, 149
B
budabhusha, alpherakyi, 62
baetica, Ocnogyna, 120
baicalensis, flavia, 67
baleanaica, dominula, 15
banghaasi, Ocnogyna, 120
barteli, purpurata, 118
bella, Utetheisa, 40
berostripesis, purpurata, 118
bicolor, pulchella, 41
bicolor, 46
bieti, Orneoues, 56
bifrons, subcarnea, 140, 141
bimacula, dominula , 16
binaghii, mendica, 129
bipunctata, Spiris, 38, 150
bithynica, dominula, 15
boettcheri, intercalaris, 62
boghaika, Lemyra, 141, 142, 152
Bombyx, 26, 39, 108, 124, 132, 133, 146
 borealis, fuliginosa, 143
Borearetia, 5, 7, 51, 147, 148, 149
boursini, maculosa, 102
bretaudii, Gonerda, 120
britannica, villica, 70
brunnea, lubricepedum, 132, 133
brunnea, cunea, 128
brunneoccephala, pulchella, 40
brunneomarginata, pulchella, 40
buddenbrocki, Preparctia, 60
budew, cunea, 128
buraetica, Sibirarctia, 78, 97, 99, 100, 151
C
caecilia, Helis, 101, 102, 104, 105, 107, 147, 151
carea, Spilosoma, 132
caesarea, luctifera, 138, 146
caesipris, plantaginis, 45
caja, Aretaia, 5, 12, 60, 61, 64, 99, 150
cajula, intercalaris, 62
Callarctia, Grammia, 83
Callactria, Aretia, 60
callesi, deserta, 124
Callimorpha, 1, 5, 6, 10, 12, 15, 17, 144, 149
Callopis, Spiris, 37
campestris, flavia, 66, 67
Canarcia, 7
caniguadensis, cribaria, 39
candida, cribaria, 39
candida, cunea, 128
Carocnopyga, 5, 6, 12, 22, 23, 78, 149
caroli, gratiosa, 88, 89
carpathica, plantaginis, 43
Casigneta, Spilarctia, 139, 140
caspica, plantaginis, 43
casta, deserta, 124
caucasiana, sannio, 112, 113
caucasica, plantaginis, 44, 71
caucasica, purpurata, 118
caucasica, sannio, 112, 113
centralasiae, matronula, 76
centralasiae, deserta, 124, 125, 131
centralhispanica, maculosa, 102
Centrarctia, 83, 96
cervini, Holoarctia, 80, 82, 151
chajataensis, buraetica, 100
charbini, subcarnea, 140, 141
Chelis, 5, 8, 10, 78, 97, 101, 104-107, 147, 149
Chelmia, Lacydes, 36
Chelonia, Cymbalophora, 22, 60, 74, 75, 106, 108
chinensis, kindermanni, 98, 99
Chionarctia, 5, 9, 125, 149
Chionophila, Parasemia, 43
chishimanum, lubricopedum, 133
chosensis, coreana, 21
chosensis, amurensis, 145
chrysographis, striata, 37
chrysoccephala, cribaria, 39
chichorii, petrosa, 45
circumpunctata, mendica, 129
clara, fuliginosa, 143
calthrata, loewii, 121
Cletis, Chelis, 101, 103
coelestina, Orontobia, 59, 60
collarlis, interrogationis, 71, 74, 75
colon, cribaria, 39
commereli, striata, 37
completa, pulchella, 40
confluens, caja, 63, 64
confluens, villica, 70, 71
confluens, plantaginis, 45
confluens, jacobaeae, 28, 29
confluens, pulchella, 40
connexa, rivularis, 22
continua, flavia, 67
coreana, histrio, 21
corpusrufum, lutea, 137
corsica, villica, 70
corsica, Oenogyna, 120
Coscinia, 5, 6, 9, 37, 38, 149
Creatonotos, 7
criphrum, cribaria, 39
cribraria. Coscinia, 9, 39, 150
Ctenia, Spiris, 37
culoti, Eucharia, 71, 75, 76, 151
cunea, Hypanthria, 1, 3, 8, 10, 127, 128, 152
cupido, Preparctia, 60
Cyenia, 12, 127, 129
Cymbalophora, 5, 6, 22, 79, 149
czekanoskii, Hyperborea, 81, 110, 111, 148, 151
D
daghestana, Ocnogyna, 122
dahurica, Chelis, 101, 102, 103, 105, 106, 108, 151
daisetsuzana, quenseli, 108
daitoensis, 132
dalailama, Orontobia, 59
dannehli, rivularis, 22
Deoitepa, Utetheisa, 40
dejeani, Hyphoraia, 47
delunulata, pulchella, 40
depuncta, pulchella, 40
deschangzei, lutea, 138
deserta, Watsonarctia, 124, 127, 152
designata, pulchella, 40
Diacrisia, 5, 9, 12, 111, 112, 117, 119, 137, 149
dialampra, Epimydia, 32, 35, 150
diaphana, Dodia, 29, 30, 32, 34, 150
Diaphora, 5, 9, 129, 149
diplosema, lemniseata, 50
diva, Divaretia, 22, 78, 79, 147, 151
Divaretia, 5, 7, 10, 78, 79, 147, 149
Dodia, 5, 8, 9, 12, 29, 111, 147, 148, 149
doccerisi, punctarium, 133
domiduca, villica, 70
domina, dominula, 15
dominula, Callimorpha, 1, 12, 15, 16, 17, 18, 144, 149, 164
dominula, dominula, 15
donna, dominula, 16, 17
dornesii, punctarium, 133
dublitzkyi, Palearctia, 83, 86, 147, 151
duplohmula, pulchella, 40

E
elegans, lubricipedum, 132
elisabethae, Oroncus, 56
elisabethana, intercalaris, 62
Elpis, Diacrisia, 111, 132
elwesi, buraetica, 100
Empyrea, 12, 14
Emydia, Spiris, 37, 39
Empatolmis, 5, 8, 146, 149
Epicallia, 5, 70, 149
Epimydia, 5, 8, 12, 35, 149
equitalis, Eucallimorpha, 20, 21
ermineum, lubricipedum, 132
erschoffi, Palearctia, 12, 83, 90, 92-96, 147, 151
erythema, lemmiscata, 50
erubescens, subcarnea, 140
erythema, lemmiscata, 50
erythema,lemniscata, 50
erythrozona, Spilosoma, 132
esperi, deserta, 124
Euarctia, Carcinopyga, 22
Eucallimorpha, 5, 6, 10, 20, 149
Eucastana, Watsonarctia, 124
Eucharia, 5, 7, 12, 71-74, 124, 149
Euchelia, Tyria, 28
Eudiaphora, 5, 8, 9, 130, 149
eudiopta, albertae, 31, 32, 111
Eulepia, Spiris, 37
Euplagia, 1, 5, 6, 12, 18, 126, 149
Euprepia, Spiris, 37
Euprepia, Parasemia, 43
Eurachia, Watsonarctia, 124
Euthemonia, Dicrisia 111
Exitelica, Utetheisa, 40
extensa, Lenmyra, 141
extrema, Spilosoma, 132
extrema, striata, 37
Exprepsia, 22, 36, 37, 60
F
coralli, quenseli, 108
fasciata, Oroncus, 56-59, 150
fedtschenkoii, principalis, 10, 20
ferghana, Palearctia, 58, 83, 86, 94, 95, 147, 151
ferghana, Chelis, 102, 107, 108, 147, 151
fervida, fuliginosa, 143
festivala, Eucharia, 71-76, 151
festivala, Pararctia, 49, 50
flava, glaphyra, 86
flava, maculosa, 103
flava, maura, 26
flava, pulchella, 41
flava, purpurata, 118
flava, gratiosa, 88, 89
flacescens, purpurata, 118
flacescens, jacobaeae, 29
flavia, Aretia, 57, 61, 66, 99, 116, 150
flavida, metelkana, 115, 116
flavoceratega, lubricipedum, 132
floecosa, plantaginis, 44
floresi, villica, 70
fluciatalis, maura, 26
formosana, histrio, 21
forsteri, Sinoarctia, 51
fridolini, cervini, 81
frisita, lutea, 138
fujienense, Spilosoma, 132
fulgida, quadripunctaria, 18, 19
fulgina, Phragmatobia, 5, 142, 143, 144, 145, 146, 152
fulminans, villica, 70
fulminans, urania, 57
fulvescens, jacobaeae, 29
fulvohirta, Alphaea, 126, 132
fumida, erubescens, 35
fumosa, urania, 57
funerea, bitumicata, 37, 38
furcula, fuliginosa, 143
G
gansoni, Tajigyna, 123, 147, 152
geddesi, plantaginis, 45
gelida, quenseli, 108
geometrica, petrosa, 43
geometrica, plantaginis, 43
gerda, purpurata, 118
gilsoni, laponica, 49
Gigantospilosoma, 125
glaphyra, Palearctia, 12, 83, 84, 85, 86, 89, 91, 94, 151
glaucia, rupicola, 91
golbecki, Palearctia, 83, 89, 91, 97, 147, 151
Gonerda, 5, 12, 119,
gracilis, Palearctia, 83, 89, 90, 147, 151
Graminia, 5, 7, 80, 108, 149
grammica, Spiris, 37
gratosia, Palearctia, 58, 83, 86, 91, 92, 147, 151
gratosata, glaphyra, 85, 86
grisescens, jacobaeae, 29
gruneri, dahurica, 106
gurkoi, Carcinopyga, 23-26, 150
guttata, Andala, 3, 98, 152
H
haberhaueri, diva, 79
hamata, aulica, 46, 47
hamelensi, dominula, 16
hanningtoni, Preparctia, 60
hebe, festiva, 71, 72
hemigona, Oenogyna, 120
hera, quadripunctaria, 18
herrichi, loewii, 121
hesselbarthi, plantaginis, 44
Hipocrita, Tyria, 28
hippetti, lutea, 138
histrio, Aglaomorpha, 6, 21
hnatecki, cervini, 80, 81
Holarctica, Grammia, 110
Holoarctica, 5, 8, 81, 82, 148, 149
honesta, maculosa, 103
hospita, plantaginis, 43
hospitata, striata, 37
houberti, Ocnogyna, 120
Hydocoela, Dodia, 29-31
hyperborea, lapponica, 49
Hyperborea, 5, 10, 110, 147, 149
Hypercompa, Aglaomorpha 21
Hyphantria, 1, 5, 7, 10, 128, 130, 149
Hyphoraia, 5, 7, 46, 53, 54, 68, 149
idriensis, matronula, 76
iliensis, festiva, 72, 74, 131
illithya, intercalaris, 62
illustrata, glaphyra, 86
inboffi, fuliginosa, 143
immaculata, purpurata, 118
immaculata, aulica, 46, 47
immaculata, flavia, 67
immaculata, phaeosoma, 64
incompleta, striata, 37
infernalis, Lemrya, 141
inquinata, cribraria, 39
insularia, cacelia, 104
insularum, plantaginis, 43
intercalaris, Arctica, 25, 61, 62, 150
intercissa, spectabilis, 36
intermedia, parasita, 121
interposita, festiva, 25, 72, 73
interrogationis, Eucharia, 71, 73-76, 151
invecsor, mendica, 129
ione, seriatopectinata, 139
irene, Diacrisia, 113-115, 151
isabella, Pyrrhacerta, 12
italicum, dominula, 15
issyka, erschoffi, 93, 94
J
jacobaeae, Tyria, 6, 28, 29, 144, 150
jankowskii, Lemrya, 138, 142, 152
japonica, amurensis, 145
japonica, lucifer, 146
japonica, lutetia, 138
japonica, plantaginis, 43, 45
jeholensis, flavia, 67
jezoensis, plantaginis, 44
johansenii, alpina, 52, 53
joiceyi, Ocnogyna, 120
K
kamtschadalis, caja, 63 64
kamtschadalus, plantaginis, 44
kansuensis, dalailama, 59
karakorumica, melanostigma, 126
karduchena, desertica, 124, 125
karelina, Alexiopoea, 26, 27, 28, 150
kashmirica, rupicola, 88, 91, 92
kasnakovi, Sinoarctia, 78
kentii, dahurica, 107
khumbeli, seitzi, 53
kiangsui, Villekana, 115
kindermanni, Siberarctica, 78, 93, 94, 97-100, 151
kolori, fuliginosa, 143
kolpakofskii, Acerbea, 54
konezukai, villica, 70
kononenkoi, Dodia, 30, 33, 147, 150
korearctia, jankowskii, 142
korlana, erschoffi, 93
kroegeri, fuliginosa, 143
kunashirica, plantaginis, 44
kurdistana, dominula, 15
L
Lacydes, 5, 35, 149
ladakensis, Arctica, 61-63, 150
ladakensis, princeps, 20
lapponica, Pararctica, 48-50, 150
latifasciata, quadripunctaria, 18, 19
leta, maculosa, 103
latreillei, Ocnogyna, 120
lederi, flavia, 67
leminiscata, Pararctica, 48, 50, 111, 150
Lemrya, 5, 7, 141, 149
lenzeni, Eucallimorpha, 20
leopardinula, Amurrhyparia, 4, 116, 119, 152
lepida, pulchella, 40
leprieuri, Ocnogyna, 120
lepus, luricipedum, 132
leucocleya, cribraria, 39
leucomepra, plantaginis, 43
leucoptera, album, 136
leucoptilota, Utetheisa, 40
leucosphilota, subcarnea, 140
lichenigera, Careinopyga, 22-24, 26, 150
lidia, subcarnea, 140, 141
likiangensis, Spilosoma, 132
lindti, proserpina, 23, 25
Lithosarctia, 79
liturata, quensteli, 108, 109
litturata, cunea, 128
loehmattleri, gratiosa, 88, 89
loewii, Ocnogyna, 120-123
lotrix, pulehella, 40
lubricipedum, Spilosoma, 12, 116, 129, 134-136, 144, 152
luctifera, Epatolemis, 146, 152
luctijera, luctifera, 146
lurida, fuliginosa, 143
lusitanica, caja, 63
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matronula, 77
lusitanica, caja, 63
lusitanica, dominula, 15
lurida, fuliginosa, 143
lusitanica, dominula, 15
lutea, Spiliscia, 12, 137, 152
lutea, dominula, 15, 141
luteotincta, matro...
obliterata, matronula, 77
obscura, fuliginosa, 143
obscura, purpurata, 117
obscurata, glaphyra, 86
occidentalis, metelkana, 115
ochracea, fuliginosa, 143
ochrea, lubricipedum, 133
ochreomaculata, pulchella, 40
ochricolor, Eucallimorpha, 20
ochromaculata, dominula, 16
Ocnogyna, 5, 8, 10, 79, 88, 99, 120, 121, 149
Ocnogynodes, 78
okinawana, metelkana, 115
okinawensis, Utetheisa, 40
olga, philippiana, 109, 110
olschwangi, Arctia, 61, 68, 69, 148, 150
ornata, atropurpurea, 54, 55
ornatrix, Utetheisa, 40
Orodemnias, Holoarctia, 80, 82, 108
Oroncus, 5, 7, 9, 12, 56, 59, 63, 88, 98, 149
Orontobia, 5, 7, 9, 12, 59
Orontobia, 5, 6, 10, 12, 56, 59, 63, 88, 98, 149
Oreptocampa, 5, 8, 10, 12, 77, 78, 80, 83, 84, 87, 88, 90, 95-97, 147, 149
Orontobia, 5, 7, 9, 12, 59
paradoxa, purpurata, 118
paradoxa, purpurata, 118
paradoxa, purpurata, 118
paranymphula, araitensis, 44
Pararctia, 5, 7, 9, 12, 48, 51, 111, 114
Parasemia, 5, 6, 10, 12, 43, 45, 144, 149
Parasita, Ocnogyna, 120, 121, 152
Pardeula, Tancrea, 79, 80, 131, 151
parthenos, Plataretia, 54
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
picta, caja, 64, 65
pectinata, Utetheisa, 40
pellex, Utetheisa, 40
Peronotoma, 5, 8, 76, 149
perorna, Gonerda, 119
persica, dominula, 17
persona, dominula, 16, 17
perunov, cervini, 81, 84
perversa, rivularis, 22
petrosa, plantaginis, 45
pfeifferi, striata, 37
phaeosoma, caja, 64, 65, 116
Phalaenae, 15, 28, 60, 63, 70, 71, 76, 101, 102, 111, 112, 120, 128, 129, 132, 137, 142, 146
phantasma, caja, 64
philippiana, Grammia, 108, 109, 151
philippsi, Callimorpha, 15, 17, 149
philippsi, festiva, 72, 73
Phragmatobia, 3, 5, 8, 12, 56, 59, 67, 142-145, 149
pierreti, Ocnogyna, 120
Pitiusa, 40
placidia, Phragmatobia, 143, 145, 146, 152
plagia, Aglaomorpha, 21
plantaginis, Parasemia, 12, 18, 43, 144, 150
Plataractia, 5, 7, 54, 149
Pleretes, Pericallia, 76
pomona, kindermanni 96, 98, 99
pomalis, dominula, 15
posteriopunctata, rivularis, 22
postflavida, gratiosa, 88
Preparctia, 5, 60, 149
pretiosa, kindermanni 96, 98, 99
principalis, Eucallimorpha, 20, 52, 149
processionea, striata, 37
proserpina, Carcinopyga, 22, 23, 24, 26, 150
pudens, Ocnogyna, 120
pudica, Cymbalophora, 22
pudica, transversa, 127
puengeleri, glaphyra, 85, 86
puengeleri, Holoarctia, 49, 80, 82, 151
pugione, Empyreuma, 14
pulchella, Utetheisa, 1, 40, 41, 122, 150, 164
pulchelloides, Utetheisa, 40
pulchra, pulse, 40
pulchrior, intercalaris, 62
pulverulenta, fuliginosa, 143, 144
Punctaturum, Spilosoma, 132-134, 152
punctata, cunea, 128
punctata, mendica, 129
punctatissima, cunea, 128
punctigera, cribraria, 39
punctigera, punctaturum, 133
punctissima, cunea, 128
purpurata, Rhyparia, 116, 117, 151
purpurata, 117
pura, fasciata, 56, 58

Q
quenelsi, Grammia, 80, 108, 151
quadripunctaria, Euplagia, 1, 18-20, 149, 164

R
radiata, mendica, 129
radiata, dominula, 16
radiata, aulica, 46, 47
radiatus, lutea, 137
rebeli, caja, 63
regalis, principalis, 20, 21
reisseri, lutea, 137
reticulata, Chelis, 101-104, 151
Rhagonis, Spilosoma, 132
rhodanica, dominula, 15
rhodoscensis, quadripunctaria, 18
rhodosoma, lutea, 137
Rhyparia, 5, 9, 12, 78, 117, 149
rhypariella, purpurata, 117
Rhyparioides, 5, 9, 12, 114-117, 149
rippertii, cribaria, 39
rishiriensis, irene, 114
rivularis, Cymbalophora, 22, 79, 149
romanovi, Preparetia, 60
romanoci, dominula, 16, 17
rondoni, cribaria, 39
rosea, lapponica, 48
rosea, festiva, 60
rosearea, glaphyra, 86
rosecenter, punctarium, 133
roseni, kindermanni, 97
russica, dominula, 15, 16
rostagnoi, Spilosoma, 132
rothschildi, parasita, 121
rougementi, cervini, 80
rubidus, albium, 136
rubra, Diacrisia, 111
rubrior, pulchella, 40
rubrocentralis, irene, 114
rubrodorsalis, caja, 64
rubrogrisea, pulchella, 40
rueckbeili, Aretia, 58, 61, 68, 69, 87, 150
rubomarginata, pulchella, 40
rupicola, Palearetia, 83, 91, 92, 147, 151
rusula, Diacrisia, 111
rustica, mendica, 129, 130
rybakowi, Spilosoma, 132

S
sabulosa, mendica, 129
sachalinensis, matronula, 76, 77
sachalinensis, plantaginis, 44, 45
saggitifera, seriatopunctata, 140
sajana, caja, 61, 63, 64
sangaica, urticeae, 135
sangunalis, castigneta, 140
sannio, Diacrisia, 12, 112-115, 131, 144, 151
sartha, festiva, 72, 73
sarycoca, Palearetia, 83, 95-97, 151
sarydzhasica, erschoffi, 93, 94
sazonovi, Dodia, 30, 34, 84, 148, 150
schottlaenderi, glaphyra, 83, 94, 95
scheuingenschussi, maculosa, 103
scriniensis, cervini, 80
scudder, plantaginis, 45
secreta, Oroneus, 56
seculis, villica, 70
seitzi, Acerbia, 53, 54, 147, 150
selmosni, erschoffi, 83, 93
selzynii, petrosa, 45
senecions, jacobaeae, 28
separata, pulchella, 40
serarum, mongolica, 96
serena, matronula, 77
sergei, gratiosa, 88, 89
seriatopunctata, Spilarctia, 137, 138, 139, 152
serum, mongolica, 96
sheljuzhko, spectabilis, 36
Sibiraretia, 5, 7, 97-100, 149
sibirica, alpina, 52, 53
sibirica, cribaria, 39
sibirica, desertica, 124, 125
sibirica, flavia, 67
siversi, Sinoaretia, 51
sifanica, plantaginis, 44, 45
signata, flavia, 67
sikhotensis, kononenkoi, 33, 34
simanensis, metelkana, 115
similis, Callimorpha, 20
simpliator, nebuosa, 117
Sinoaretia, 5, 51, 78
Sinowatsonia, 5
slivnoensis, maculosa, 103, 105
slovenica, striata, 37
sojota, dahurica, 106, 107
Somatichrichia, Ocnogyna, 120
sordida, cervini, 81
soror, jankowskii, 142
sotavaltai, atropurpurea, 55
sotiradiis, lubrificedum, 133
soukeana, metelkana, 115
spectabilis, Lacydes, 35, 36, 150
Spilarctia, 5, 9, 12, 132, 134, 137-140, 149
Spilosoma, 5, 7, 9, 12, 111, 132, 133, 136, 144, 149
Spilosoma, Spilosoma, 132
Spiris, 5, 6, 12, 37, 39, 149
splendida, cervini, 80
splendidior, Euplagia, 19, 20, 149
standfussi, mendica, 129
Stauropolia, 14, 42, 43
stertzi, maculosa, 102
stettei, cervini, 80
stoetzneri, plantaginis, 44
straudi, setzti, 53
streltsovi, Spilosoma, 132, 136, 152
striata, Spiris, 37, 38, 150
striatopunctata, casigneta, 139, 140
strios, quenseli, 108
stripata, mendica, 129
subalpina, plantaginis, 43
subcarnea, Spilarctia, 137, 138, 142, 152
sublutea, Diacrisia, 111
subnebulosa, Pararctia, 48, 50
subvarius, Rhyparioides, 114
suffusa, cunea, 128
sultana, maculosa, 103, 104
sussamyra, ferghana, 94, 95
suttadra, intercalaris, 62
swanetica, dominula, 15
syrdarja, sannio, 112, 113
syriaca, villica, 70
Taglangla, Orontobia, 59
Tajigyna, 5, 123, 147, 149
Tancrea, 5, 78, 79, 97, 149
tancrei, Oroncus, 12, 56, 57, 58, 59, 62, 63, 150
taurica, fuliginosa 143
teberdina, dominula, 15
tenera, Cynia, 12
teriolens, cunea, 80
testudinaria, Hyphoraia, 47
testudinarioides, aulica, 46, 47
textor, cunea, 128
Thinatarchia, Lemyra, 141
thibetica, pulverulenta, 143
thibetica, intercalaris, 62
Thimida, 13
thomanni, plantaginis, 43
thulea, alpina, 52
thytea, pulchella, 40
tianshana, Chelis, 95, 102, 103, 107, 147, 151
tillae, setzi, 53
tkatchukovi, splendidior, 19
totinigra, lutea, 138
totirubra, fuliginosa, 143
totinigra, jacobaeae, 29
transbaikalensis, kononenkoi, 33
transcaucasica, maura, 27
transcaucasica, reticulata, 103, 104
transiens, purpurata, 118
transitoria, lubricipedum, 133
transmontana, caja, 65
transversa, Andala, 127, 152
triangularis, deserta, 124, 125
Trichosoma 120
trigona, Micaretia, 77
trybomi, plantaginis, 44
tschiliensis, phaeosoma, 64
tshimgana, caja, 25, 63, 64
tsingeauana, subcarnea, 140
tundrana, Pararecta, 48, 49, 50, 111, 148, 150
turbans, Grammia, 108, 110, 151
turensis, Eudiaphora, 130, 131, 152
turkestan, ferghana, 94, 95
Tympanophora, Cymbalophora, 22
Tyria, 5, 6, 28, 78, 144, 149
thyter, pulchella, 41

U
unicolor, lutea, 138
unifascia, Andala, 126
uniformis, sannio, 112, 113
unipuncta, lubricipedum, 133
unipunctata, pulchella, 40
uralensis, flavia, 66, 67
uralensis, plantaginis, 44
uralensis, purpurata, 118
urania, Oroncus, 56, 57, 150
urticae, Spilosoma, 129, 132-136, 144, 152
ussuriensis, kindermanni, 98
utahensis, caja, 65
Utetheisa, 1, 5, 6, 12, 40, 149

V
valida, buractia, 100
variabilis, ferghana, 94, 95
cartiana, transversa, 127
cenosa, mendica, 129
cernetensis, cribaria, 39
verticalis, Dodia, 30
vidis, soror, 142
victori, dublitzkyi, 87
vidua, villica, 70
villica, Epicallia, 70, 151
Volgarcia, Lacydes, 35
culpinaria, sannio, 112

W
wagneri, Palearetia, 83, 90, 92
walkeri, pulchella, 132
wambachi, villica, 70
Watsonarcia, 5, 8, 124, 149

T

U
unicolor, lutea, 138
unifascia, Andala, 126
uniformis, sannio, 112, 113
unipuncta, lubricipedum, 133
unipunctata, pulchella, 40
uralensis, flavia, 66, 67
uralensis, plantaginis, 44
uralensis, purpurata, 118
urania, Oroncus, 56, 57, 150
urticae, Spilosoma, 129, 132-136, 144, 152
ussuriensis, kindermanni, 98
utahensis, caja, 65
Utetheisa, 1, 5, 6, 12, 40, 149

V
valida, buractia, 100
variabilis, ferghana, 94, 95
cartiana, transversa, 127
cenosa, mendica, 129
cernetensis, cribaria, 39
verticalis, Dodia, 30
vidis, soror, 142
victori, dublitzkyi, 87
vidua, villica, 70
villica, Epicallia, 70, 151
Volgarcia, Lacydes, 35
culpinaria, sannio, 112

W
wagneri, Palearetia, 83, 90, 92
walkeri, lubricipedum, 132
wambachi, villica, 70
Watsonarcia, 5, 8, 124, 149
IV-6. Index of the Main Food Plants of Tiger Moth Caterpillars
(numbers of pages have varied; concern to old variant, let you not take into consideration)

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Pages</th>
<th>Plant Name</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achillea</td>
<td>48, 66, 71, 74, 79, 103, 119, 123</td>
<td>Galeopsis</td>
<td>130</td>
</tr>
<tr>
<td>Achillea millefolium</td>
<td>66</td>
<td>Galium</td>
<td>22, 79, 118, 114, 119, 125, 135, 139, 146</td>
</tr>
<tr>
<td>Agrostis</td>
<td>38</td>
<td>Galium verum</td>
<td></td>
</tr>
<tr>
<td>Alissum</td>
<td>74</td>
<td>Genista</td>
<td></td>
</tr>
<tr>
<td>Allium schoenoprasum</td>
<td>66</td>
<td>Gentiana</td>
<td>94, 121</td>
</tr>
<tr>
<td>Alnus incana</td>
<td>49, 56</td>
<td>Geranium sanguineum</td>
<td>133</td>
</tr>
<tr>
<td>Andromeda polifolia</td>
<td>144</td>
<td>Geum</td>
<td>94</td>
</tr>
<tr>
<td>Artemisia</td>
<td>24, 27, 38, 74, 79, 96, 119</td>
<td>Hieraicium</td>
<td>38, 48, 77, 114, 146</td>
</tr>
<tr>
<td>Artemisia campestris</td>
<td>119</td>
<td>Hieracium umbellatum</td>
<td>114, 119</td>
</tr>
<tr>
<td>Asperula</td>
<td>125</td>
<td>Impatiens noli-tangere</td>
<td>130</td>
</tr>
<tr>
<td>Asperula cynanchica</td>
<td>22</td>
<td>Lactuc</td>
<td>79</td>
</tr>
<tr>
<td>Atragalus</td>
<td>79, 94, 126, 158</td>
<td>Lactuca sativa</td>
<td>133</td>
</tr>
<tr>
<td>Betula</td>
<td>46, 56, 66, 130</td>
<td>Lamium</td>
<td>19, 66, 71, 130, 135</td>
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<td>Betula nana</td>
<td>49, 56</td>
<td>Lamium album</td>
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<td>Calamagrostis</td>
<td>48</td>
<td>Lamium lanceolata</td>
<td>38</td>
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<td>Calluna vulgaris</td>
<td>38, 38, 114, 144</td>
<td>Lathyrus</td>
<td>94</td>
</tr>
<tr>
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<td>115</td>
<td>Linum</td>
<td>144</td>
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<td>Calystegia septium</td>
<td>66</td>
<td>Lonicera</td>
<td>17, 19, 77</td>
</tr>
<tr>
<td>Carelia</td>
<td>144</td>
<td>Lythrum salicaria</td>
<td>130</td>
</tr>
<tr>
<td>Centaurea</td>
<td>28, 71</td>
<td>Malus domestica</td>
<td>66</td>
</tr>
<tr>
<td>Chamaenerion angustifolium</td>
<td>114, 130, 144</td>
<td>Melandrium</td>
<td>46</td>
</tr>
<tr>
<td>Chenopodium</td>
<td>74, 130</td>
<td>Mentha</td>
<td>135</td>
</tr>
<tr>
<td>Chrysanthemum</td>
<td>123</td>
<td>Mentanthes</td>
<td>135</td>
</tr>
<tr>
<td>Cirsium</td>
<td>74, 114, 123</td>
<td>Myosotis</td>
<td>17, 144</td>
</tr>
<tr>
<td>Compositae</td>
<td>123</td>
<td>Nigrum</td>
<td>139</td>
</tr>
<tr>
<td>Corals</td>
<td>89</td>
<td>Onopordum</td>
<td>123</td>
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<td>Corylus</td>
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<td>Panicum</td>
<td>126</td>
</tr>
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<td>Crataegus eocineae</td>
<td>66</td>
<td>Petasites</td>
<td>29</td>
</tr>
<tr>
<td>Cynoglossum</td>
<td>17, 48, 74, 146</td>
<td>Phragmites</td>
<td>115</td>
</tr>
<tr>
<td>Deschampsia</td>
<td>48</td>
<td>Phalaris arundinacea</td>
<td>38</td>
</tr>
<tr>
<td>Elymus arenarius</td>
<td>38</td>
<td>Pismum sattivum</td>
<td>133</td>
</tr>
<tr>
<td>Elytrigia repens</td>
<td>38</td>
<td>Plantago</td>
<td>38, 41, 46, 48, 52, 60, 66, 71, 135, 139, 144, 146, 146</td>
</tr>
<tr>
<td>Epilobium</td>
<td>19</td>
<td>74, 79, 94, 114, 119, 121, 126, 126, 130, 133, 135, 144</td>
<td>135, 139, 144, 146, 146</td>
</tr>
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<td>Euphorbia</td>
<td>24, 48, 74, 114, 115, 146</td>
<td>Polygonum</td>
<td>52, 60, 114, 115, 133, 135, 144</td>
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<tr>
<td>Festuca</td>
<td>38, 38</td>
<td>Polygonum persicaria</td>
<td>115</td>
</tr>
<tr>
<td>Festuca ovina</td>
<td>38</td>
<td>Populus</td>
<td>17, 66</td>
</tr>
<tr>
<td>Fragaria</td>
<td>17, 66, 71</td>
<td>Populus tremula</td>
<td>66</td>
</tr>
<tr>
<td>Fraxinus</td>
<td>17, 77</td>
<td>Populus tremula</td>
<td>66</td>
</tr>
</tbody>
</table>

wiltshirici. Andala, 98, 127
wiskotti, caja, 64, 65
X
xanthoptera, striata, 37
Xenorma, 13
Y
y-albula, Mieraretia, 78
yarrowii, Pararetia, 48
yuldashevi, turensis, 131
<table>
<thead>
<tr>
<th>Species</th>
<th>Page Numbers</th>
<th>Species</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentilla</td>
<td>48</td>
<td>Saxifraga</td>
<td>81</td>
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<td>Potentilla erecta</td>
<td>144</td>
<td>Scabiosa</td>
<td>121</td>
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<tr>
<td>Primula farinosa</td>
<td>81</td>
<td>Sedum telephium</td>
<td>66</td>
</tr>
<tr>
<td>Prunus</td>
<td>17, 66, 77</td>
<td>Senecio</td>
<td>29, 135</td>
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<td>Prunus domestica</td>
<td>66</td>
<td>Silene</td>
<td>46, 81</td>
</tr>
<tr>
<td>Prunus nana</td>
<td>66</td>
<td>Sorbus aucuparia</td>
<td>66, 119</td>
</tr>
<tr>
<td>Prunus padus</td>
<td>89</td>
<td>Spalanzenia</td>
<td>144</td>
</tr>
<tr>
<td>Quercus robur</td>
<td>77, 139</td>
<td>Spiraea salicifolia</td>
<td>66</td>
</tr>
<tr>
<td>Ribes uvacrispa</td>
<td>66</td>
<td>Stachys sylatica</td>
<td>66, 130</td>
</tr>
<tr>
<td>Ranunculus</td>
<td>17</td>
<td>Stellaria</td>
<td>146</td>
</tr>
<tr>
<td>Rheum rhaponticum</td>
<td>66</td>
<td>Taraxacum</td>
<td>35, 36, 48, 52, 53, 54, 57, 59, 66, 71, 79</td>
</tr>
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<td>Rheum rhaponticum</td>
<td>139</td>
<td>Tussilago</td>
<td>29</td>
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<tr>
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<td>66</td>
<td>Taraxacum mongolicum</td>
<td>117</td>
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<td>Ribes uvacrispa</td>
<td>139</td>
<td>Thymus</td>
<td>74</td>
</tr>
<tr>
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<td>66</td>
<td>Trifolium</td>
<td>66, 114, 119, 123, 130, 133, 144</td>
</tr>
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<td>Rubus</td>
<td>17, 19, 62, 66, 133, 139, 144, 146</td>
<td>Trifolium repens</td>
<td>133</td>
</tr>
<tr>
<td>Rubus chamaemorus</td>
<td>49</td>
<td>Triticum sativum</td>
<td>126</td>
</tr>
<tr>
<td>Rubus idaeus</td>
<td>66, 133, 139, 144</td>
<td>Ulex</td>
<td>79</td>
</tr>
<tr>
<td>Rumex</td>
<td>46, 74, 79, 130, 133, 135, 144</td>
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<td>17, 117</td>
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<td>Rumex crispus</td>
<td>146</td>
<td>Vaccinium uliginosum</td>
<td>44, 56, 114, 133</td>
</tr>
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<td>Sarothamnus</td>
<td>144</td>
<td>Ubbeliereae</td>
<td>24, 79</td>
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<tr>
<td>Salix</td>
<td>17, 61, 66, 114, 119, 130, 144</td>
<td>Urtica</td>
<td>17, 71, 114, 121, 135</td>
</tr>
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<td>Salix herbacea</td>
<td>53</td>
<td>Urtica dioeca</td>
<td>130, 133, 139</td>
</tr>
<tr>
<td>Salix phylicifolia</td>
<td>133</td>
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</tr>
<tr>
<td>Salix repens</td>
<td>119</td>
<td>Vaccinium myrtillus</td>
<td>46, 66, 119, 144</td>
</tr>
<tr>
<td>Salix starkeana</td>
<td>144</td>
<td>Vaccinium uliginosum</td>
<td>44, 56, 114, 133</td>
</tr>
<tr>
<td>Salvia</td>
<td>38, 79</td>
<td>Veronica</td>
<td>146</td>
</tr>
<tr>
<td>Salvia pratensis</td>
<td>38</td>
<td></td>
<td></td>
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</tbody>
</table>
## IV-7. Arctiid Species As Distributed Between Food Plants

<table>
<thead>
<tr>
<th>Number of species of Arctiidae feeding on a given plant</th>
<th>Name of plant</th>
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<tbody>
<tr>
<td>23</td>
<td>Plantago</td>
<td>63, 68, 75, 81, 84, 91, 125, 130, 133, 135, 148, 158, 164, 172, 174</td>
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<tr>
<td>20</td>
<td>Taraxacum</td>
<td>44, 52, 56, 61, 75, 89, 130, 137, 158, 172</td>
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<td>19</td>
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<td>14, 17, 75, 81, 153, 160</td>
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<td>11</td>
<td>Achillea</td>
<td>14, 61, 75, 130, 137, 153, 172</td>
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<td>11</td>
<td>Lamium</td>
<td>22, 91, 118, 130, 137, 146, 160, 164, 175</td>
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<td>Rubus</td>
<td>14, 17, 56, 75, 158, 164, 172, 175</td>
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<td>9</td>
<td>Artemisia</td>
<td>52, 60, 130, 133, 158, 160, 172</td>
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<td>52, 84, 91, 153, 158, 160, 172</td>
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<td>75, 130, 137, 142, 143, 153, 158, 172</td>
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<td>Urtica</td>
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<td>24, 54, 84, 130, 133, 175</td>
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<td>5</td>
<td>Hieracium</td>
<td>40, 54, 130, 175</td>
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<td>Prunus</td>
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</tr>
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<td>Geum</td>
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<td>Fragaria</td>
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<td>Populus</td>
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<td>Ribes uva crispa</td>
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<tr>
<td>3</td>
<td>Salvia</td>
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</tr>
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<td>Asperula</td>
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</tr>
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<td>Gentiana</td>
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</tr>
<tr>
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<td>Fraxinus</td>
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</tr>
<tr>
<td>2</td>
<td>Lactue</td>
<td>91</td>
</tr>
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<td>Festuca</td>
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</tr>
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<td>Lonicera</td>
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</tr>
<tr>
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<td>Myosotis</td>
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</tr>
<tr>
<td>2</td>
<td>Onopordum</td>
<td>142, 143</td>
</tr>
<tr>
<td>2</td>
<td>Potentilla</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>Rheum rhaps onicum</td>
<td>75</td>
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<tr>
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<td>Seneceio</td>
<td>30, 160</td>
</tr>
<tr>
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<td>Silene</td>
<td>52, 94</td>
</tr>
<tr>
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<td>Sorbus aucuparia</td>
<td>75, 137</td>
</tr>
<tr>
<td>2</td>
<td>Ulmus</td>
<td>14, 134</td>
</tr>
</tbody>
</table>
49. 2 Umbelipperae 91
50. 1 Geranium sanguineum 158
51. 1 Galeopsis 153
52. 1 Impatiens nolitangere 153
53. 1 Genista 134
54. 1 Festuca ovina 40
55. 1 Calamagrostis 1
56. 1 Caltha 1
57. 1 Calystegia sepium 1
58. 1 Carelia 1
59. 1 Corals 1
60. 1 Corylus 1
61. 1 Crataegus coecinea 1
62. 1 Deschampsia 1
63. 1 Agrostis stolonifera
64. 1 Alissum
65. 1 Allium schoenoprasum
66. 1 Andromeda polifolia
67. 1 Elymus arenarius 1
68. 1 Elytrigia repens 1
69. 1 Epilobium 1
70. 1 Lathyrus 125
71. 1 Leguminosae 138
72. 1 Linum 172
73. 1 Loonier 89
74. 1 Lythrum salicaria 153
75. 1 Malus domestica 75
76. 1 Melandrium 52
77. 1 Mentha 160
78. 1 Menyanthes 160
79. 1 Nigrum 164
80. 1 Panicum 147
81. 1 Petasites 30
82. 1 Phalaris arundinacea 43
83. 1 Pisum sativum 158
84. 1 Primula farinosa 94
85. 1 Quercus robur 164
86. 1 Ranunculus 14
87. 1 Rosaeae 75
88. 1 Sarothamnus 172
89. 1 Saxifraga 94
90. 1 Scabiosa 141
91. 1 Sedum telephium 75
92. 1 Spalanzania 172
93. 1 Spiraea salicifolia 75
94. 1 Stachys sylvatica 75, 153
95. 1 Stellaria 175
96. 1 Thymus 84
97. 1 Triticum sativum 147
98. 1 Tussilago 30
99. 1 Ulex 91
100. 1 Veronica 175
IV-8. References

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3. References to some regional faunas of Arctiidae


V. Colour plates

2. *Callimorpha dominula* L. Ukraine, Donetsk Region, Severskiy Donets River, Brusino, 24.VI.1935 (e.l.), Smirnov, ♀. (Coll. V. Murzin)

3. *Callimorpha dominula* ssp. (?) ♀. Armenia, S. slope of Mt. Aragats, Inaklu, 2000 m, 10.VI.1987 (e.l.), V. Murzin leg. (Coll. V. Murzin)


Plate 1. *Callimorpha – Euplagia*


3. *Eucallimorpha principalis* (Kollar), ♂ N. Nepal, Mt. Annapurna, 28°34'N, 83°50'E, 4200 m, 6.VII.1995, E. Afonin & V. Sinyaev leg. (Coll. V. Murzin)

4. *Eucallimorpha principalis* (Kollar), ♀ N. Nepal, Mt. Annapurna, 28°34'N, 83°50'E, 4200 m, 7.VII.1995, E. Afonin & V. Sinyaev leg. (Coll. V. Murzin)

5. *Eucallimorpha principalis fedtschenkoi* (Gr.-Gr.), ♂. Tajikistan, W. Pamirs, Shakh Dara River, Barvaz 2800 m, 20.VII.1987, (Coll. V. Murzin)

Plate 2. *Euplagia – Eucallimorpha*
1. Aglaomorpha histrio (Walker), ♂. N. Korea, Pyongyang, 10.VIII.1990. S. Murzin leg. (Coll. V. Murzin)
6. Tyria jacobaeae (L.), ♂. Russia, Rostov-on-Don Region, Ust-Donetsk Distr., 12.VI.1976, A. Grazhdankin leg. (Coll. V. Murzin)
7. Cymbalophora ricularis (Mén.). ♂. Russia, Daghestan, Kopchugai, 10.IX.1937, M. Rjabov (Coll. V. Murzin)
8. Tyria jacobaeae (L.), ♀. Russia, Moscow Region, Egoryevsk Distr., Nikitkino, 13.V.1930 (e.l.), A. Tsvetaev leg. (Coll. V. Murzin).
Plate 3. Aglaomorpha – Tyria
3. *Dodia diaphana* (Ev.). Russia, Altai, Ukok Plateau, Argamzha River, 2900 m, 10.VII.1991, V. Murzin leg. (Coll. V. Murzin)
4. *Dodia sazonovi* Dub. Œ. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2600 m, 16.VII.1990. V. Murzin leg. (Coll. V. Murzin)
6. *Dodia sazonovi* Dub. Œ. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2600 m, 16.VII.1990, V. Murzin leg. (Coll. V. Murzin)
11. *Spiris striata* (L.) Œ. Russia, Central Caucasus, Teberda, Djemagat River, 2.VII.1916, G. Pashin (Coll. V. Murzin)
12. *Spiris striata* (L.) Œ. Russia, Altai, near Biysk, 2.VIII.1931, P. Valdayev (Coll. V. Murzin)
15. *Spiris bipunctata* (Stgr.) Œ. Mongolia, Lake Dood-Nur, 22.VII.1966, V. Solyanikov (Coll. V. Murzin)
Plate 4. *Axiopoena – Coscinia*
3. Parasemia plantaginis plantaginis (L.), f. hospita (Den. & Schiff.). ♂. Russia, Moscow City, Losinyi Ostrov Park, 22 VII. 1973, S. Murzin leg. (Coll. V. Murzin)
7. Parasemia plantaginis sifanica (Gr.-Gr.). ♂. Russia, Altai, Chemal, 11 VII. 1990, V. Murzin leg. (Coll. V. Murzin)
9. Parasemia plantaginis sifanica (Gr.-Gr.), f. nycticans (Mén.). ♀. Russia, Altai, Kurayskiy Mt. Range, Aktash, 1800 m, 10 VII. 1990, V. Murzin leg. (Coll. V. Murzin)
10. Parasemia plantaginis sachalinensis Mats. ♂. Russia, Kamchatka, near Petropavlovsk, VII. 1965 (Coll. V. Murzin)
13. Parasemia plantaginis caucasica (Mén.). ♂. Armenia, Tsakhkadzor (Darachichag), 24 VI. 1925 (Coll. V. Murzin)
16. Pararctica lemniscata Stichel. ♂. Russia, Yakutia, Indigirka River, 5 VII. 1977, A. Grazhdankin leg. (P. lemniscata Stich., V. Dubatolov det.) (Coll. V. Murzin)
17. Pararctica tundrana Tshist. ♂. Russia, E. Chukotka, Chaplino, Goryache Klyuchi, 22 VII. 1963, A. Tsvetaev leg. (Coll. V. Murzin)
7. *Gonerda* sp. Nepal, Khumbu Himal (Mt. Everest region), Siangbotehe, 4000 m, 10.V.1996, leg. S. Murzin (Coll. V. Murzin)
Plate 6. *Borearctia – Platarectia*
5. *Arctia caja* (L.), ♀. Ukraine, Crimea, Simeiz, 1000 m, 17.08.88, V. Sinyaev leg. (Coll. V. Sinyaev)
Plate 7. Arctia


Plate 8. *Arctia*


7. *Arctia flavia* (Fuessly), ab. ?. Russia, Central Urals, Nizhniy Tagil, 29.V.1932, A. Tsvetaev leg. (Coll. V. S. Murzin)

1. *Arctia rueckbeili* (Png.). Tajikistan, Pamirs-Alai, Alaiskiy Mt. Range, Dugoba River, 3000 m, 15.VII.1985, V. Murzin leg. (Coll. V. S. Murzin)


Plate 10. _Arctia – Eucharia_
Plate 11. *Eucharia*
9. *Palearctia mira* Dub. & Tshist. ♂. Russia, Altai, Kurayskiy Mt Range, env. Aktash, 2900 m, 50°19’N, 88°00’E, 1-10.VII.1997, leg V. S. Murzin (Coll. V. Murzin)
Plate 12. *Pericallia – Holoarctia*


Plate 13. *Palearctia*


11. *Chelis maculosa mannerheimi* (Dup.). Russia, Rostov-on-Don Region, Ust-Donetsk, 15.VI.1976, A. Grazhdankin leg. (Coll. V. Murzin)


1. *Chelis dahurica* (Boisdo.). ♂. Russia, Altai, Kurayskiy Mt. Range, Aktash, 2500 m, 1-10.VII.1997, leg. V. Murzin (Coll. V. Murzin)

2. *Chelis dahurica* (Boisdo.). ♀. Russia, Altai, Sailugem Mts, Dzhumala River, 2700 m, 14.VII.1990, leg. V. Murzin (Coll. V. Murzin)


7. *Grammia quenseli* (Payk.). Austria, S. Tyrol, Franz Rhihohe, 2400 m, 20.VII.1925 (Coll. ZMUM)


9. *Grammia quenseli liturata* (Mén.). Russia, N. Buryatia, VII.1917 (Coll. V. Murzin)

10. *Grammia turbarbs* (Christoph). ♂. E. Siberia, Vitim Table-land, Baisa, 10.08.1978, V. Dubatolov leg. (Coll. V. Murzin)


Plate 15. Chelis – Hyperborea


7. *Diacrisia irene* Btl. ♀. Russia, Primorye, Ussuriysk, Gorno-Tayozhnaya Research Station, 10.VII.1979, V. Murzin leg. (Coll. V. Murzin)


Plate 16. Diacrisia – Rhyparioides


Plate 17. *Rhyparioides – Chionarctia*


7. *Andala transversa* (Moore). ‡. Uzbekistan, Alaisky Mts. Range, Dugoba River, near Yardan, 40°00'N, 71°45'E, 2400 m, 10.VII.1995, S. Murzin leg. (Coll. V. Murzin)


11. *Diaphora mendica* (Cl.). ‡. Russia, Moscow, 35 road-km of Kaluzhskoe Highway, 02.06.1973, V. Murzin leg. (Coll. V. Murzin)

12. *Diaphora mendica* (Cl.). ♀. Russia, Caucasus, Krasnodar Region, Sochi, Adler, Kudepsta, 1956 (Coll. V. Murzin)


17. *Eudiaphora turensis* (Ersch.). Tajikistan, Pamirs, Khorog, 25.06.1959, Zapryagaev leg. (Coll. V. Murzin)


4. *Spilosoma lubricipedum* (L.). ♀. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 10.VII.1962, V. Murzin leg. (Coll. V. Murzin)


9. *Spilosoma lubricipedum* (L.). ♀. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 12.VII.1963, V. Murzin (Coll. V. Murzin)


11. *Spilosoma urticae* (Esp.). ♀. Russia, Moscow Region, Desna River, 35 km SW. of Moscow City, 24.VI.1962, V. Murzin leg. (Coll. V. Murzin)

Plate 19. *Spilosoma*
10. *Spilarctia lutea* (Hfng.). ♀. Russia, Moscow Region, Desna River, 35 km SW of Moscow City, 10.VIII.1972, leg. V. Murzin (Coll. V. S. Murzin)
11. *Spilarctia lutea* (Hfng.). ♀. Russia, Moscow Region, Desna River, 35 km SW of Moscow City, 10.VIII.1972, leg. V. Murzin (Coll. V. S. Murzin)
Plate 20. *Spilosoma – Spilarctia*


5. *Lemyra boghaika* Tshist. & Kishida. ♀. Russia, Khabarovsk Region, 15 km N. of Obluchye, 15.VII.1993, V. Sychev leg. (Coll. V. Murzin)


10. *Spilarctia seriatopunctata* (Motsch.). ♀. Russia, Primorye, Vladivostok, Okeanskaya, 1956, L. Anufriev det. (Coll. V. Murzin)


Plate 21. *Spilaretia*
2. *Lemyra jankowskii* (Ob.). ♀. Russia, Primorye, Ussuriysk, Kaymanovka, 18.VII.1979, V. Murzin leg. (Coll. V. Murzin)
5. *Phragmatobia fuliginosa* (L.). ♀. Russia, Moscow City, VII.1990. V. Sinyaev leg. (Coll. V. Sinyaev)
6. *Phragmatobia fuliginosa borealis* (Stgr.). ♀. Russia, Moscow Region, Dubna, 12.VIII.1960, O. Grachev leg. (Coll. V. Murzin)
7. *Phragmatobia fuliginosa borealis* (Stgr.). ♂. Russia, Moscow Region, Dubna, 12.VIII.1960, V. Murzin leg. (Coll. V. Murzin)
Plate 22. Lemyra – Phragmatobia
11. *Epatolmis luctifera* (Denis & Schiff.). ♂. Russia, Primorye, Ussuriysk, Gorno-Taezhnaya Research Station, 27.VII.1979, S. Murzin leg. (Coll. V. Murzin)
Plate 23. *Phragmatobia – Epatolmis*


Plate 24. *Sinoarctia – Preparctia*
1. *Callimorpha dominula* (L.), Central Russia
2. *Euplagia quadripunctaria* (Poda), Armenia
3. *Eucallimorpha principalis fedtchenkoi* (Gr.-Gr.), Pamirs
4. *Aglaomorpha histrio* (Walker), N. Korea
5. *Carcinopyga proserpina lindti* Černy, Uzbekistan
6. *Axiopoea karelini* Mén., Armenia
7. *Tyria jacobaeae* (L.), Abkhazia (after Dubatolov, 1990d)
8. *Dodia diaphana arctica* Tshstjakov, Magadan Region (after Tshstjakov, 1988)
10. *Lacydes spectabilis* (Tauscher), Kopetdagh
11. *Parasemia plantaginis sifanica* Gr.-Gr., Altai
12. *Hyphoraia aulica* (L.), Central Siberia (after Dubatolov, 1990d)
Plate 25. Male genitalia of *Callimorpha* to *Borearctia*.
1. *Orocnus alaica* O. B.-H., Alaiskiy Mt. Range  
2. *Arctia flavia* (Fuessly), Altais  
3. *Eucharia festica* (Hfng.), China (after Fang, 2000)  
4. *Pericallia matronula* (L.), Central Siberia (after Dubatolov, 1990d)  
5. *Holoarctia marinae* Dub., Altais (after Dubatolov, 1985b)  
7. *Palearctia mongolica* (Alph.), Mongolia (after Dubatolov, 1985b)  
8. *Sibirarctia kindermanni* (Stgr.), Khakassia, South Siberia (after Dubatolov, 1985b)  
10. (1) *Chelis ferghana* Dub., Chatkal Mt. Range; (2) *Chelis tianshana* Dub., Kirghizskiy Mt. Range (after Dubatolov, 1988)  
12. *Diacrisia sannio* (L.), Moscow City  
13. *Rhyparioides amurensis* (Brem.), Amurland  
14. *Rhyparia purpurata* (L.), Tian-Shan
Plate 26. Male genitalia of *Oroncus* to *Chionarctia*
1. *Amurrhyparia leopardinula* (Strand), Amurland (after Dubatolov, 1985a)
2. *Chionarctia nivea* (Mén.), Amurland (after Dubatolov, 1990d)
3. *Hyphantria cunea* (Drury), Crimea, after Churaev, 1962
5. *Eudiaphora turensis afghanistanensis* (Daniel), Afghanistan (after Daniel, 1966)
6. *Spilosoma lubricopedum* (L.), Moscow region
7. *Spilarctia casigneta* (Kollar), China (after Fang, 2000)
8. *Spilarctia seriatopunctata* (Moteh.), Primorye
9. *Lemyra jankozskii* (Obertür), China (after Fang, 2000)
10. *Phragmatobia fuliginosa* (L.), China (after Fang, 2000)
11. *Epatolmis huctjera* (Den. & Schiöl.), China (after Fang, 2000)
Plate 27. Male genitalia of *Amurrhyparia* to *Epatolmis*
Professor Vladimir Murzin (born in 1927), a nuclear physicist and Doctor of Physical Sciences, developed an interest in butterflies and moths during his childhood. Today, his collection of Lepidoptera is one of the largest privately owned in Russia. He is a member of the Russian Entomological Society, and is the author of several scientific and popular-science books concerning butterflies and moths and of more than 20 other publications covering ecology and entomology. He has made approximately 50 collecting trips to various parts of the former Soviet Union where he has discovered several new species and subspecies of butterflies and moths.

The present book is a monographic treatment of tiger moths, the Arctiidae, of the former Soviet Union. In covering most of the Palearctic fauna, this publication is unprecedented both in scope and scrupulousness. Numerous colour pictures and several drawings richly illustrate the more than 100 species and subspecies referred to in the book. Identification keys are mainly based on peripheral characters, although in several cases genital ones are used. Many full-colour photographs show pinned specimens (mainly arranged in 24 plates) and also a variety of live moths and/or their characteristic habitats.

Above left: Vladimir Serguevich Murzin (photo by A. Southwick).
Above right: A female Chlosandra desbouvieri (Bod.) resting on a stone on the slopes of Sayhote-Mountains, Russian - Mongolian border, elevation 2700 m above sea level (photo by V. S. Murzin).
Below right: A male Euplagia quadripunctaria (Pl.) one of the few tiger moths feeding on flowers. Armenia, Aragats Mountains (photo by V. S. Murzin).
On the front cover: A male Palacaria orvillii (Alph.) resting on a rock in the Terskey-Alatau Mountains, Kyrgyzia, Central Asia (photo by V. S. Murzin).