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A contribution to the knowledge of the Lepidoptera fauna of the Ukok plateau in south-eastern Altai, Russia

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Abstract

A Check-list of 224 species of Lepidoptera of the Ukok plateau is presented. 11 species are recorded for the first time in Russia, 12 in Siberia and 53 in Altai. The data of distribution and some systematic notes are given for some species. The genitalia of *Catoptria fenestratella* (CARADJA, 1928) (male), *Napuca insigna* (ALPHÉRAKY, 1883) (female) and *Dysgnophos glaciatus* WEHRLI, 1922 (female) are figured for the first time.

Zusammenfassung

Die Arbeit beinhaltet eine Checkliste von 224 Lepidoptera-Arten des Ukokplateaus im Südosten des Altai-Gebirges. Davon sind 11 Arten Erstnachweise für Russland, 12 für Sibirien und 53 für den Altai. Für einige Arten werden Verbreitungsangaben und systematische Hinweise gegeben. Die Genitalstrukturen von *Catoptria fenestratella* (CARADJA, 1928) (Männchen), *Napuca insigna* (ALPHÉRAKY, 1883) (Weibchen) und *Dysgnophos glaciatus* WEHRLI, 1922 (Weibchen) werden erstmals zur Abbildung gebracht.

Introduction

The present paper contains results of investigations on Lepidoptera of different families. The material had been collected by O. BIDZILYA in the Ukok plateau in 1995. The region of investigation is a high mountains plateau (2100-2400 m) in the south-eastern Altai (Fig.1). The plateau is surrounded by mountain ranges, the highest of them is massive Taban-Bogdo-Ola with its peak Kiytyr (4358 m) placed in Mongolia territory.

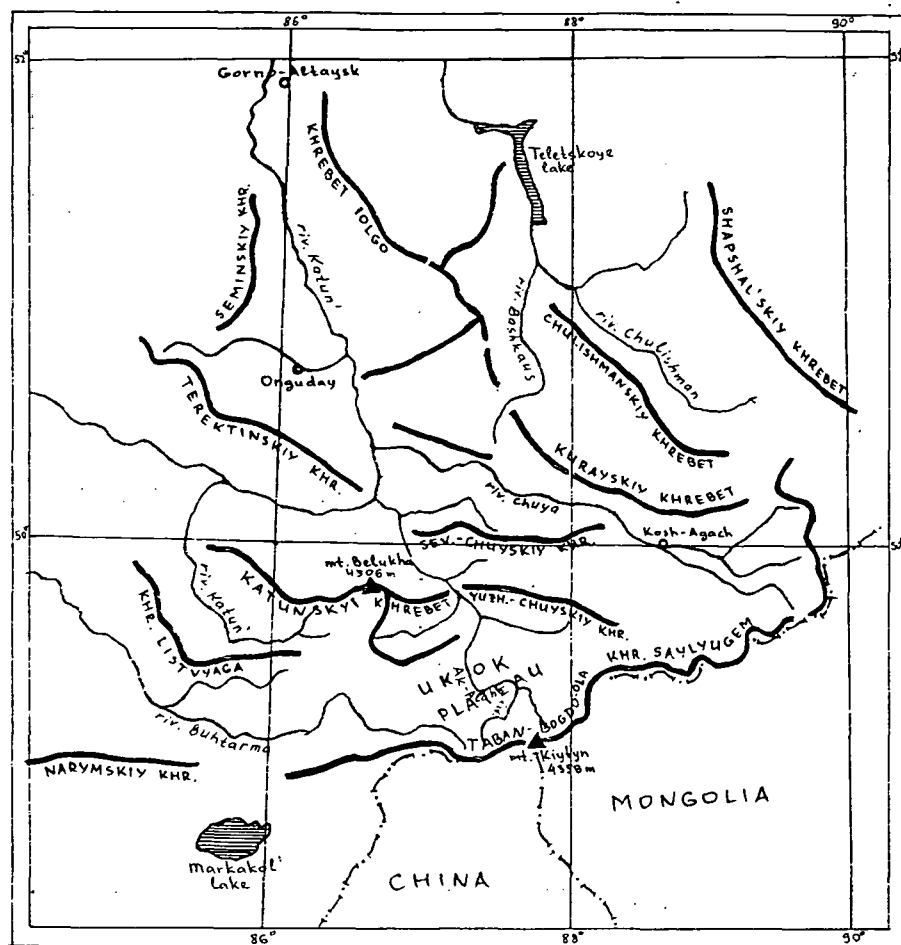


Fig. 1: Altai mountains

The greatest part of the plateau is a hilly plain with numerous glacial lakes. The largest river of the Ukok plateau is Ak-Alaha (with tributary Kolguty) which belongs to the Katun river system.

The climate of the plateau is continental. The average temperatures are -34°C in January and $+8^{\circ}\text{C}$ in July. The average temperature of the year is -7°C . Due to such low temperatures the largest part of the plateau is very wet, in spite of the comparative poor precipitation (215 mm per year with maximum in summer). The daily amplitudes of temperatures can reach 50°C in summer (GORYNI ALTAI 1971).

The vegetation of the Ukok plateau is an interesting mixture of steppe and tundra plant

species associations. The tundra plants are represented typically on the upper river valleys and on the north-eastern slopes, while south slopes and gently parts of plateau are covered by associations of steppe plants mainly. *Betula nana*, *Dasiphora fruticosa* and different dwarfish willows form dense thicket along the river beds. The wood plants are represented by small groves of *Larix* sp. on the edge of the plateau only.

The Lepidoptera were collected near the confluence of Kaldjin and Ak-Alaha rivers mainly. The following biotopes were investigated:

1. Mountain tundra (MT) in the swampy slopes covered by *Salix* spp., *Driada* sp., *Empetrum* sp. etc.
2. Mountain steppe (MS) with domination of different cereals (*Agropyron* sp.) as well as *Artemisia* sp., *Potentilla* sp., *Leontopodium* sp. and others.
3. The south slopes (SS) with rich grassy plants defended from winds.
4. The grove of *Larix* (GL) on the left bank of the Ak-Alaha river.

Besides, some material was collected in other parts of the plateau such as Mai-Tobe Mountain (3242 m) in the south-eastern part of Ukok and Kara-Chat gorge in the South of Ukok near the North slopes of the Taban-Bogdo-Ola.

The greatest part of moths was collected in the evening until sunset by "freighting away" from plants and "mowing" in the grass. Some moths also were collected with the use of "Petromax" lamp during the rare warm nights.

We also included in the present list some material (Sphingidae and some Arctiidae) collected by R. YAKOVLEV in the Ukok in the years 1996-1997.

The following abbreviations are accepted in the check-list:

MT = mountain tundra; MS = mountain steppe; SS = South slopes; GL = grove of *Larix*;
* = species new for Altai; ** = new for Siberia; *** = new for Russia.

Systematic part

Nepticulidae

1. *Stigmella confusella* (WOOD & WALSINGHAM, 1894)*: 15.6. (1) SS. Before it was recorded from Europe (PUPLESIS 1994) and North Transbaikalia (KULISHENKO 1987).

Incurvariidae

1. *Lampronia splendidella* (HEINEMANN, 1870): 11., 17., 23.7. (3) MS, GL. In day-time.

Adelidae

1. *Nemophora bellela* (WALKER, 1863) (= *esmarkella* WOCKE, 1864): 28.6.; 2., 3., 17.7. (5) GL. In day-time.

Psychidae

1. ? *Epichnopterix sieboldi* (REUTTI, 1853)***: 8., 28.6. (2) MS. Was known earlier from Europe only (KOZHANTCHIKOV 1956). In day-time.
2. *Epichnopterix plumella sibirica* WEHRLI, 1933: 3.7. (1) MS. In day-time.
3. *Rebelia nocturnella* (ALPHÉRAKY, 1876)*: 15.-22.6. (8) SS, MS. In the evening until sunset.

Tineidae

1. *Monopis spilotella* (TENGRÖM, 1847)*: 5., 10.7. (2) SS.
2. *Monopis fenestratella* HEYDEN, 1863**: 5.7. (1) SS. Before it was known from West

Europe, the Ukraine, Black sea coast of the Caucasus and middle Volga region (ZAGULAJEV 1960, 1981). Our specimen from Altai has very reduced transparent spots on fore wing, but the male genitalia of the specimen are corresponding with typical European specimens.

Zygaenidae

1. *Jordanita budensis* (SPEYER & SPEYER, 1858): 28.6.; 4., 17.7. (3) SS.
2. *Zygaena exulans* (HOHENWARTH, 1792): 28.6.-15.7. (21). All biotopes, but most common in MS. In day-time.

Sesiidae

1. *Synanthedon flaviventris* (STAUDINGER, 1883)*: 17.7. (1) GL. In day-time.

Tortricidae

1. *Falseuncaria degreyana* (MCLACHLAN, 1869)*: 8.6.-21.7. (11) SS.
2. *Aethes decens* RAZOWSKI, 1969: 7.7. (3) GL. In the twilight after sunset. Did not come to the light of "Petromax". Endemic of Altai and Tuva mountains (KOSTJUK 1971; RAZOWSKI 1971; KUZNETSOV & JALAVA 1988).
3. *Aethes deutschiana* (ZETTERSTEDT, 1839): 15.6.-3.7. (9) SS. It is necessary to note the large variability of the male genitalia of this species which is expressed in the shape, length and width of valvae and aedeagus. But the habitus of all moths is identical, therefore we believe that they belong to the same species.
4. *Aethes obscurana* (CARADJA, 1916)**: 8.6.-22.7. (9) SS. It is supposed that this species is endemic of Tien-Shan mountains, known from Kazakhstan and Kyrgyzstan only (RAZOWSKI 1971; KUZNETSOV 1978; KUZNETSOV & al. 1996).
5. *Cochylimorpha pyramidana* (STAUDINGER, 1870)*: 23.6.-15.7. (7) SS.
6. *Phtheochroa vulneratana* (ZETTERSTEDT, 1839): 3.7. (1) SS.
7. *Amphicacoecia adamana* (KENNEL, 1919): 2.7. (1) SS. Endemic of the mountains of South Siberia and Mongolia (KOSTJUK 1971; KUZNETSOV & JALAVA 1988).
8. *Eana argentina* (CLERCK, 1759): 17.6.-23.7. (6) SS.
9. *Eana osseana* (SCOPOLI, 1763): 17.6.-22.7. (6) SS.
10. *Eana andreana* (KENNEL, 1919): 15.7. (1) SS.
11. *Xerocnephasia rigana* (SODOFFSKY, 1829)*: 8., 23.6. (2) SS.
12. *Choristoneura albaniana* (WALKER, 1863)* (= *lapponana* TENGSTRÖM, 1869): 8.6.-22.7. (5) SS.
13. *Aphelia stigmatana* (EVERSMANN, 1844)**: 6., 8.7. (3) SS.
14. *Clepsia aerosana* (LEDERER, 1853)*: 2., 21., 22.7. (4) SS.
15. *Clepsia senecionana* (HÜBNER, 1819): 20.6.-21.7. (4) SS.
16. *Selenodes aquilonana* (KARVONEN, 1932): 3.7. (1) SS.
17. *Rudisociaria expeditana* (SNELLEN, 1833): 21.6.-5.7. (4) SS.
18. *Phiaris turfosa* (HERRICH-SCHÄFFER, 1851): 21.6.-17.7. (4) SS.
19. *Phiaris palustrana* (LIENIG & ZELLER, 1846) 17.7. (1) SS.
20. *Phiaris obsoletana* (ZETTERSTEDT, 1839): 2., 7., 17.7. (4) SS.
21. *Phiaris stibiana* (GUENÉE, 1845)*: 30.6.-11.7. (9) SS.
22. *Tia enervana* (ERSCHOFF, 1877)*: 10.6.-13.7. (5) SS.
23. *Ancylis comptana* (FRÖLICH, 1828): 10.6.-22.7. (8) SS.
24. *Ancylis geminana* (DONOVAN, 1806)*: 15.6.-11.7. (9) SS.

25. *Ancyliis myrtillana* (TREITSCHKE, 1830)*: 16.6. (1) SS.
26. *Eucosma tetraplana* (MÖSCHLER, 1866): 23.6.-22.7. (9) MS; Kara-Chat gorge, MS, 2400 m, 14.7. (1). In day-time.
27. *Eriopsela falkovitchi* KOSTJUK, 1979: 8., 17., 22.7. (5) SS.
28. *Dichrorampha cinerascens* (DANILEVSKY, 1948): 10.6.-17.7. (8) SS.
29. *Dichrorampha altaica* DANILEVSKY, 1968: 17.6. (1) SS. Endemic in south-eastern Altai. It was known before with four specimens from the type series (DANILEVSKIJ & KUZNETSOV 1968; KUZNETSOV 1978). The only male from Ukok has an obvious broad yellowish dorsal spot over the middle of fore wing, which is absent in specimens from the type series. In spite of this fact, the male genitalia of this specimens are corresponding to that of the holotype absolutely.
30. *Grapholiitha aureolana* (TENGSTRÖM, 1848): 2.7. (1) SS.
31. *Pammene clanculana* (TENGSTRÖM, 1869)*: 21.7. (4) SS.

Choreutidae

1. *Antophila bidzilyai* BUDASHKIN, 1997: 2.7. (1) SS. The species was described and is known from Ukok plateau only (BUDASHKIN 1997).

Bucculatricidae

1. *Bucculatrix artemisiella* HERRICH-SCHÄFFER, 1855*: 30.6.-17.7. (6) SS. Before it was known from West Europe, Saratov region of Russia, Turkmenistan and Transbaikalia (SEKSJAEVA 1993; BUDASHKIN & KOSTJUK 1994).
2. *Bucculatrix ratisbonensis* STANTON, 1861*: 11., 17., 19.7. (3) SS. Known before from West Europe, the Ukraine (Crimea: Karadagh Reserve), Saratov region of Russia, Turkmenistan and Transbaikalia (SEKSJAEVA 1993; BUDASHKIN & KOSTJUK 1994).
3. *Bucculatrix* sp.: 2.7. (1) SS. It was difficult to determine this only female.

Gracillariidae

1. *Parornix* sp.: 27.6.; 3., 17., 21.7. (5) SS.

Douglasiidae

1. *Tinagma mongolicum* GAEDIKE, 1991*: 27.6.; 4., 21., 22.7. (4) SS. Known before from Transbaikalia and Mongolia (GAEDIKE 1991; BUDASHKIN & KOSTJUK 1994). Our record is the most western in the areal of this species. New for West Siberia.

Yponomeutidae

1. *Swammerdamia pyrella* (VILLERS, 1789)*: 11.7. (3) SS.

Plutellidae

1. *Plutella xylostella* (LINNAEUS, 1758): 16.6.-20.7. (9). Very common in all biotopes, including the top of Mai-Tobe mountain (3242 m).
2. *Plutella* sp.: 17.6. (1) SS.
3. *Ypsolopha acuminatus* (BUTLER, 1878)***: 6., 12.7. (3) SS. Before known from Japan only (MORIUTI 1977) (det. Z.S. GERSHENZON).
4. *Ypsolopha japonicus* MORIUTI, 1964***: 19.7. (1) SS. Before known from Japan only (MORIUTI 1977) (det. Z.S. GERSHENZON).
5. *Ypsolopha vitellus* (LINNAEUS, 1758)*: 6.7. (1) SS (det. Z.S. GERSHENZON).

Epermeniidae

1. *Epermenia insecurella* (STANTON, 1849): 30.6.; 2., 5., 23.7. (5) SS.
2. *Epermenia strictella* (WOCKE, 1867): 3.7. (1) SS.
3. *Ochromolopis kaszabi* GAEDIKE, 1973: 8., 17., 21.7. (5) SS. The nominative subspecies is endemic in the North of Central Asia (GAEDIKE 1973, 1993; BUDASHKIN & SACHKOV 1991; BUDASHKIN & KOSTJUK, 1994).

Oecophoridae

1. *Pleurota sibirica* REBEL, 1901: Kara-Chat gorge, MS, 2400 m, 14., 15.7. (5). In day-time. Endemic in the North of Central Asia (LVOVSKY 1992).

Coleophoridae

1. *Multicoloria astragalella* (ZELLER, 1849)**: 5.7. (1) SS.
2. *Multicoloria conspicuella* (ZELLER, 1849): 15., 17.7. (3) SS.
3. *Multicoloria cavilosa* (REZNIK, 1975)***: 30.6.; 5.7. (3) SS. Before the species was known from Mongolia (REZNIK 1975).
4. *Multicoloria vibicigerella* (ZELLER, 1839): 21.6. (1) SS.
5. *Ecebalia monoceros* (FALKOVITSH, 1975)*: 2.-22.7. (6) SS; Kara-Chat gorge, MS, 2400 m, 14.7. (2). In day-time. The species was known from Mongolia (FALKOVITSH 1975) and Transbaikalia (BIDZILYA et al. 1998).
6. *Ecebalia magyrica* (BALDIZONNE, 1983)**: 29.6.; 5.7. (2) SS.
7. *Ecebalia squamosella* (STANTON, 1856)** (= *erigerella* FORD, 1935): 2.-23.7. (7) SS. Before this species has not been registered east of the Caucasus (VIVES MORENO 1988; FALKOVITSH & JALAVA 1996).
8. *Ecebalia* (?) *atriplicis* (MEYRICK, 1928)*: 14.7. (1) SS. Before this species was registered from Baltic countries (VIVES MORENO 1988; IVINSKIS 1993) and Transbaikalia (BIDZILYA et al. 1998).
9. *Ecebalia* pr. *obsenella* (HERRICH-SCHÄFFER, 1855)** (= *virgaureae* STANTON, 1857): 28.6.; 3.7. (2) SS.
10. *Casignatella albulae* (FREY, 1880)***: 10.6. (1) SS. Before it was known from Switzerland, Italy and South Turkmenistan (VIVES MORENO 1988; FALKOVITSH 1989, 1992; BALDIZZONE 1995).

Depressariidae

1. *Exaeretia mongolicella* (CHRISTOPH, 1882): 21.6.; 4., 7., 10., 22.7. (6) SS. In the evening and at light of "Petromax" lamp. Before it was known from Baltic countries, Far East of Russia (LVOVSKY 1986; IVINSKIS 1993) and Transbaikalia (BIDZILYA et al. 1998).

Ethmiidae

1. *Ethmia soljanikovi* DANILEVSKY & ZAGULAJEV, 1975*: 28.6.-8.7. (8) MS, SS. In day-time. Before it was known from Tuva and Mongolia (ZAGULAJEV 1975; DANILEVSKIJ 1980).

Elachistidae

1. *Elachista biatomella* (STANTON, 1848)*: 23.6.; 18.7. (2) SS. Before the species was known from Europe (TRAUGOTT-OLSEN & NIELSEN 1977; FALKOVITSH 1981; BUDASHKIN & SINEV 1991; SRUOGA 1991; KAILA 1992; BIDZILYA 1995) and

Transbaikalia (BIDZILYA et al. 1998).

2. *Elachista* (?) *herrichii* FREY, 1859*** (= *reuttiana* FREY, 1859): 7.7. (2) SS. Before it was recorded in West Europe only (TRAUGOTT-OLSEN & NIELSEN 1977; FALKOVITSH 1981).
3. *Elachista orstadii* N. PALM, 1943**: 8., 21.7. (2) SS. Before it was recorded in Europe and Far East of Russia (TRAUGOTT-OLSEN & NIELSEN 1977; FALKOVITSH 1981; SINEV & SRUOGA 1997).
4. *Hemiprosopa altaica* SINEV, 1998: 28.6. (1) SS. The species was described and known from Ukok plateau only (SINEV 1998).
5. *Cosmiotes stabilella* (STANTON, 1858)*: 18.6.-15.7. (7) SS. In the East Palaearctic it was recorded from Transbaikalia only (BIDZILYA et al. 1998). New for West Siberia.

Gelechiidae

1. *Monochroa ferrea* (FREY, 1870)*: 17., 22.7. (2) SS. Before it was known from Europe (KARSHOLT & RIEDL 1996) including the European part of the former USSR (PISKUNOV 1981) and Transbaikalia (BUDASHKIN & KOSTJUK 1994).
2. *Bryotropha purpurella* (ZETTERSTEDT, 1839)*: 27.6.-17.7. (10) SS. In the evening until sunset. Moths were found sitting at the ends of cereal leaves, often "in copula" position. Being disturbed they do not fly away but fall to the ground pretending to be dead. This species was known from North Europe (KARSHOLT & RIEDL 1996), the European part of the former USSR (PISKUNOV 1981) and Transbaikalia (BIDZILYA et al. 1998).
3. *Gelechia sororculella* (HÜBNER, 1817): 15., 22.7. (1) SS.
4. *Chionodes holosericeella* (HERRICH-SCHÄFFER, 1854): 10., 16., 22.7. (3) SS.
5. *Ch. pr. flavipalpella* HUEMER & SATTTLER, 1995: Kara-Chat gorge, MS, 2400 m, 13.7. (1). Status of this probably undescribed taxa was discussed recently (HUEMER & SATTTLER 1995).
6. *Chionodes nubellella* (ZETTERSTEDT, 1839)*: 3.7. (1) SS. It was known from North Europe, Kola Peninsula (PISKUNOV 1981) and Magadan region (HUEMER & SATTTLER 1995).
7. *Chionodes continuella* (ZELLER, 1839)*: 10., 17.7. (2) SS, GL.
8. *Chionodes tantella* HUEMER & SATTTLER, 1995*: 10.6.; 3., 7.7. (4) SS. This species was described from Mongolia recently (HUEMER & SATTTLER 1995), it was also known from Transbaikalia (BIDZILYA et al. 1998).
9. *Neofriseria caucasicella* SATTTLER, 1960**: 10., 21.7. (2) SS. This species was described from the Caucasus (SATTTLER 1960), concrete type-locality is unknown ("Caucasus m."). Later it was recorded from Moldova (PISKUNOV 1987) and Ukraine (BIDZILYA & BUDASHKIN 1998). The additional records of this species from the Caucasus (Karachaevo-Cherkesskaya Republic) are as follows: "Caucasus, Psysh River, 12.7.93, A. ZHAKOV leg." The specimens from the Caucasus differ from those from Altai by more bright, reddish-brown colour of forewing.
10. *Prolita sexpunctella* (FABRICIUS, 1794)*: 20.7. (1) MT. In day-time.
11. *Gnorimoschema mongolorum* POVOLNÝ, 1969*: 15., 17.7. (2) SS.
12. *Gnorimoschema nordlandicolella* (STRAND, 1902)*: 11., 22.7. (2) SS.
13. *Gnorimoschema valesiella* (STAUDINGER, 1877)*: 25.6. (1) SS.
14. *Scrobipalpa* (?) *marmorella* POVOLNÝ, 1969***: 4.7. (4) SS. Before it was known

from Mongolia only (POVOLNÝ 1969, 1978).

15. *Scrobipalpa murinella* (DUPONCHEL, 1843)**: 18.6. (1) SS. This species is widely distributed in Europe (POVOLNÝ 1996) and was found in the Lower Volga region recently (ANIKIN & PISKUNOV 1995).
16. *Syncopacma albifrontella* (HEINEMANN, 1870)*: 15.6. (3) SS; Kara-Chat gorge, MS, 2400 m 21.7. (1). In day-time and in the evening until sunset. Before it was known from Europe (KARSHOLT & RIEDL 1996), Transbaikalia (BIDZILYA et al. 1998), Mongolia (PISKUNOV 1990) and China (LI 1993).
17. *Aproaerema* sp.: 15.6. (1) SS. On the male genitalia this species is distinguishable from other *Aproaerema*, but the only specimen of this possibly undescribed species is in a very poor condition and further material is needed to clarify its taxonomic status.

Scythridae

1. *Scythris obscurella* (SCOPOLI, 1763): 20.6.-17.7. (10) SS, MS. In the evening as well as in day-time often on flowers.

Cosmopterigidae

1. *Pancalia schwarzella* (FABRICIUS, 1798) (= *latreillella* CURTIS, 1830): 8., 15., 20., 27.6.; 11.7. (6) SS.
2. *Eteobalea anonymella* (RIEDL, 1965): 16.6. (1) SS.

Pterophoridae

1. *Platyptilia calodactyla* ([DENIS & SCHIFFERMÜLLER], 1775): Kara-Chat gorge, MS, 2400 m, 14.7. (1). In day-time.
2. *Platyptilia gonodactyla* ([DENIS & SCHIFFERMÜLLER], 1775)* (= *megadactyla* [DENIS & SCHIFFERMÜLLER], 1775): 7.7. (1) SS. At light.
3. *Platyptilia tesseradactyla* (LINNAEUS, 1761): 30.6.; 8.7. (2) SS. At light.
4. *Paraplatyptilia sibirica* (ZAGULAEV, 1983): 21.7. (1) SS. At light.
5. *Paraplatyptilia terminalis* (ERSCHOFF, 1877): 8.6.-13.7. (5) GL, MS. In day-time.
6. *Stenoptilia pterodactyla* (LINNAEUS, 1761): 8.6.-22.7. (20). Common in all biotopes; Kara-Chat gorge, MS, 2400 m, 14.7. (3). In day-time.
7. *Stenoptilia pelidnodactyla* (STEIN, 1837) (= *borealis* WOCKE, 1864): 3., 17.7. (3) SS. At light.
8. *Stenoptilia nolckeni* (TENGSTRÖM, 1869) (= *caesia* SNELLEN, 1884): 8.7. (1) SS. At light.
9. *Hellinsia distinctus* HERRICH-SCHÄFFER, 1855)*: 10.6.-17.7. (17). Common in all biotopes.
10. *Hellinsia mongolicus* (ZAGULAJEV, 1972): 30.6.; 7., 17.7. (3) SS. At light.

Phycitidae

1. *Epipischnia* sp.: 30.6.; 4., 10.7. (4) SS.
2. *Hypochoalcia* sp.: 30.6. (1) SS.
3. *Pima boisduvaliella* (GUENÉE, 1845)*: 3.7. (1). SS. At light.
4. *Ancylosis* (?) *syrtella* (RAGONOT, 1887)**: 5.7. (1) SS.

Pyraustidae

1. *Eurrhynchus schrankiana* (HOCHENWARTH, 1785): 21., 24.6. (2) MS. In day-time.
2. *Eurrhynchus phrygialis* (HÜBNER, 1796)**: 13., 14., 24.6. (3) MS. In day-time.

3. *Panstegia aerealis* (?) *apicalis* (HÜBNER, 1813)*: 30.6.; 5., 23.7. (3) SS. In day-time and at light.
4. *Boreophila manualis* (GEYER, 1832): 23.6. (2) MS. In day-time.
5. *Boreophila ephippialis* (ZETTERSTEDT, 1839): 2., 13.7. (4) MS. In day-time.
6. *Pyrausta aurata* (SCOPOLI, 1763)*: 8.6.-17.7. (5) SS, GL, rare in MS. In day-time.

Crambidae

1. *Crambus perlellus* (SCOPOLI, 1763)*: 17.7. (3) SS.
2. *Catoptria fenestratella* (CARADJA, 1928): Kara-Chat gorge, MS, 2400 m, 14.7. (4). In day-time. Endemic in the Altai and Tuva mountains (BLESZYNSKI 1965; KOSAKEWITSH 1982). The male genitalia of this species (Fig. 2) was unknown before.
3. *Catoptria languidella* (ZELLER, 1863): 8.7. (1) SS.
4. *Agriphila biarmica* (TENGSTRÖM, 1865)*: 3.7. (1) SS. Before the species was recorded in Siberia from Jakutia and Transbaikalia only (USTJUZHANIN & DUBATOLOV 1990; BUDASHKIN & KOSTJUK 1994).
5. *Pediasia altaica* (STAUDINGER, 1899): 18.6.-22.7. (8) SS.
6. *Pediasia sajanella* (CARADJA, 1925): 28.6.-23.7. (8) SS. Endemic of the mountains of Altai, Sajon, South Tuva and north-western Mongolia (BLESZYNSKI 1965; KOSAKEWITSH 1982). We confirm that this species differs well from *P. georgella* KOSAK. and *P. jukundella* H.-S. by larger size and more unicolor greyish of both wings. In the male genitalia *P. sajanella* differs by the bluntly cutted (unlike fluently narrowing in *P. georgella* and *P. jukundella*) top of aedeagus and absence of the obvious hillock as well as the sklerotized margin of valva. At least feature of *P. sajanella* CAR. is similar to that of *P. fascelinella* HBN. but differs well from latter one by the size of aedeagus, which is approximately equal to that of *P. georgella* but much less long and massive than that of *P. fascelinella*.
7. *Pediasia radicivitta* (FILIPJEV, 1927)*: 30.6.; 6., 4.7. (4) SS. Endemic in the North of Central Asia (KOSAKEWITSH 1982). Our record is more western in the areal of this species.
8. *Pediasia aridella caradjaella* (REBEL, 1907)*: 11.7. (1) SS.

Sphingidae

1. *Hemaris tityus* (LINNAEUS, 1758): Upper part of the Kudabai river, 2600 m, 25.6.96 (1) (R. YAKOVLEV leg.).
2. *Deilephila porcellus* (LINNAEUS, 1758): Jumaly river, 2200 m, 18.7.96 (1) (R. YAKOVLEV leg.).
3. *Hyles euphorbiae* (LINNAEUS, 1758): Upper part of the Kudabai river, 2600 m, 25.6.96 (1) (R. YAKOVLEV leg.).

Geometridae (the generic combinations of VIIDALEPP 1996 are accepted)

1. *Xanthorhoe decoloraria* (ESPER, [1806])* (= *munitata* HÜBNER, 1809): 3., 10., 23.7. (3) SS. At light.
2. *Xanthorhoe fluctuata* (LINNAEUS, 1758): 30.6. (1) SS. At light.
3. *Xanthorhoe sajanaria* (PROUT, 1914): 10.6. (1) SS. At light.
4. *Eupithecia centaureata centralisata* (STAUDINGER, 1892): 8.6.; 2.7. (2) SS. At light.
5. *Cleta* sp.: 23.7. (1) MS; Kara-Chat gorge, MS., 2400 m, 14, 21.7. (2). A new species which will be soon described (KOSTJUK in litt.).

6. *Holarctias rufinaria* (STAUDINGER, 1861): 29.6.; 2., 9.7. (3) SS. In day-time.
7. *Napuca obscurata* (WEHRLI, 1953): 12.7. (1) SS, MS. In day-time.
8. *Napuca insigna* (ALPHERAKY, 1883): 17., 22.7. (2) SS, MS. In day-time. The female genitalia of this species (Fig. 3) was unknown before.
9. *Napuca taylorae sibirica* (DJAKONOV, 1955): 10.6.; 2., 17., 22.7. (4) MS. In day-time.
10. *Dysgnophos glaciatus* WEHRLI, 1922*: 4., 5.7. (3) SS. At light. Before it was known from Sayan Mountains and North Mongolia (VIIDALEPP 1996). The structure of genitalia (Fig. 4, 5) are similar with those of *D. turfosaria* WEHRLI, 1922, but the moths differ well by external morphology.
11. *Psodos coracina tundrana* WEHRLI, 1919*: 2., 5., 10.7. (15) MT. In day-time.

Arctiidae

1. *Eilema debile* (STAUDINGER, 1887): Kara-Chat gorge, MS, 2400 m, 15.7. (1). In day-time.
2. *Setina irrorella insignata* STAUDINGER, 1881: 5., 6., 15.7. (8) SS. At light.
3. *Dodia diaphana* (EVERSMANN, 1848): 2., 7.7. (5) GL. At light.
4. *Epimydia dialampra* STAUDINGER, 1892: 6.6.-15.7.95 (20) MS. Very common in the morning until the beginning of the cutting wind.
5. *Parasemia plantaginis* (LINNAEUS, 1758): May-Pak, 30.6.-2.7.97 (4) (YAKOVLEV leg.).
6. *Acerbia alpina* (QUENSEL, 1802): Stone slopes below top of Mai-Tobe mountain (3100 m), 16.7. (1). In day-time.
7. *Platarctia atropurpurea* (O. BANG-HAAS, 1927): Sarp-Tas, 2950 m, 8.7.96 (1) (R. YAKOVLEV leg.).
8. *Arctia flavia* (FUESSLY, 1779): Jumaly river, 2200 m (1) (R. YAKOVLEV leg.).
9. *Chelis daturica* (BOISDUVAL, 1832): 4.-11.7. (5) SS. At light.

Noctuidae

1. *Athaumasta expressa* (LEDERER, 1855): 29.6.; 5., 8.7. (4) SS.
2. *Athaumasta siderigera* (CHRISTOPH, 1893): 29.6.; 6.7. (2) SS.
3. *Euchalcia altaica* DUFAY, 1968: 6.7. (1) SS.
4. *Autographa camptosema* (HAMPSON, 1913)***: 6.7. (1) SS. This species have been registered for the first time in Russia, Siberia, Altai. Distribution: India, Afghanistan (HACKER 1990), Mongolia. Also in collection of Z. KLYUCHKO there are moths from Kyrgyzstan and Tadjikistan (unpublished data). Male genitalia of type has been described by L. RONKAY (1986).
5. *Syngrapha hohenwarthi alaica* (REBEL, 1906): 29.6.; 2., 11.7. (3) SS. In day-time.
6. *Sympistis nigrita sibirica* (ALPHERAKY, 1895)***: 14.7. (1) SS. This subspecies has been found for the first time in Russia, Siberia and Altai. Before the subspecies has been registered in Mongolia (SUKHAREVA 1980).
7. *Isochlora viridis* STAUDINGER, 1882*: 16.7. (1) SS. The areal of the species includes Middle Asia, mountains of South Siberia, Mongolia, Tibet, Kashmir (VARGA 1976). First record from Altai.
8. *Chilodes distracta* (EVERSMANN, 1848): 4.7. (1) SS.
9. *Apamea extincta* (STAUDINGER, 1892): 4., 6., 8.7. (3) SS.
10. *Apamea zeta marmorata* (ZETTERSTEDT, [1839] 1840): 4., 5., 8., 13.7. (4) SS.
11. *Apamea maillardi schildei* (STAUDINGER, 1901)*: 4., 5., 6., 8., 11.7. (7) SS. It is

- spread over the Alps, Middle Europe mountains and Finland, some subspecies have been described from mountains of Mongolia and Tuva (VARGA 1982).
12. *Apamea altijuga* (KOZHANTSHIKOV, 1925): 4., 11.7. (5) SS.
 13. *Apamea leucodon* (EVERSMANN, 1837): 5.7. (1) SS.
 14. *Mesapamea hedeni* (GRAESER, 1888): 4., 6.7. (4) SS.
 15. *Hadula trifolii* (HUFNAGEL, 1766): 23.06 (1); 6.7. (2) SS.
 16. *Hadula schavyra* (O. BANG-HAAS, 1927): 6., 13.7. (3) SS.
 17. *Hadula odontites boisduvali* HACKER, 1998*: 15.-29.6. (4) SS. The subspecies is spread over the East Palaearctic, mainly in mountains. For the first time registered in Altai.
 18. *Hadula colletti colletti* (SPARRE-SCHNEIDER, 1876)**: 24.6.; 4., 6.7. (5) SS. This subspecies is described from Norwegian Alps. It is spread also over Kyrgyzstan, Transbaikalia, Altai, Mongolia and North-West China. Subsp. *H. colletti originalis* HACKER, 1998 is spread over the mountains of Armenia, Turkey, Persia (HACKER 1998).
 19. *Hada plebeja* (LINNAEUS, 1761): 6.7. (1) SS.
 20. *Hadena variolata dealbata* (STAUDINGER, 1892): 4.7. (2) SS. The subspecies is spread over East Palaearctic.
 21. *Sideridis simplex* (STAUDINGER, 1889)*: 11., 12., 16., 20., 24., 29.6.; 5., 13.7. (11) SS. It is known from Middle Asia, Mongolia, Tibet and Kashmir (SUKHAREVA 1974). It is found for the first time in Altai.
 22. *Papestra biren* (GOEZE, 1781): 13.7. (1) SS.
 23. *Polia altaica* (LEDERER, 1853): 7.7. (2) SS.
 24. *Polia bombycina* (HUFNAGEL, 1766): 5.7. (1) SS.
 25. *Eriopygodes imbecilla* (FABRICIUS, 1794): 8.7. (1) SS.
 26. *Lasionycta dovrensis altaica* (HAMPSON, 1905): 4., 6., 8., 23.7. (8) SS.
 27. *Lasionycta skraelingia* (HERRICH-SCHÄFFER, [1852]): 4.7. (1) SS.
 28. *Euxoa lidia adumbrata* (EVERSMANN, 1842): 6.7. (2) SS.
 29. *Euxoa ochrogaster rossica* (STAUDINGER, 1881)*: 5., 6.7. (2) SS. Holarctic. Subsp. *rossica* is known from Palaearctic region, also from Transbaikalia (KLJUTSHKO 1994). For the first time found in Altai.
 30. *Euxoa sibirica* (BOISDUVAL, [1837]): 11.7. (1) SS.
 31. *Agrotis segetum* ([DENIS & SCHIFFERMÜLLER], 1775): 4., 5., 8.7. (5) SS.
 32. *Ochropleura arctica* KONONENKO, 1981*: 8.7. (1). SS. The species has been described from tundra mountains of Magadan region (KONONENKO 1981), it is known also from East Yakutia and Taimyr (ZOLOTARENKO 1990).
 33. *Protexarnis squalida* (GUENÉE, 1852): 13.7. (1) SS.
 34. *Rhyacia caradrinoides* (STAUDINGER, 1897): 4., 5., 8.7. (3) SS.
 35. *Chersotis ononensis* (BREMER, 1861): 6., 11.7. (2) SS.
 36. *Chersotis transiens* (STAUDINGER, 1897)*: 6., 8., 11., 23.7. (5) SS. It is known from Middle Asia mountains, Tarbagatai, Mongolia, Tibet (SUKHAREVA 1980). For the first time found in Altai.
 37. *Hermonassa albifurca* (ERSCHOV, 1877): 6., 11.7. (2) SS.
 38. *Paradiarsia coturnicola altaica* HACKER, 1998***: 25., 29.6.; 5.-8., 11.7. (9) SS. This subspecies is spread over Eastern Siberia, Amur district and North Persia (LEHMAN & al. 1998). The species is found in Altai for the first time.

39. *Xestia senescens* (STAUDINGER, 1881): 29.6.; 4., 8.7. (4) SS.
40. *Xestia distensa* (EVERSMANN, 1851)*: 5.-7., 11., 13.7. (6) SS. Moths which have been registered for the first time in Altai. Their uncus and terminal part of valves are similar of ones described by M. FIBIGER (1993). This species is spread over Central and Eastern Siberia (KONONENKO & al. 1989), also known from Northern Sweden, Finland and north-western Russia (FIBIGER 1993).
41. *Xestia speciosa* (HÜBNER, [1809-1813]): 4., 7., 8.7. (3) SS.
42. *Xestia tecta* (HÜBNER, [1808])*: 4., 7., 8.7. (4) SS. The species is found in Altai for the first time. The species has a holarctic distribution which includes the boreal part of Fennoscandia, north-western European part of Russia, North Ural, North and Central Siberia, Alaska, north-western and Central Canada (FIBIGER 1993).
43. *Estimata oschi* KOZHANTSHIKOV, 1937: 3., 5., 6., 8., 13.7. (7). SS. The species is spread over Altai (KOZHANTSHIKOV 1937; LEHMAN & al. 1998).

Hesperiidae

1. *Syrichthus tessellum* (HÜBNER, [1803]): Kara-Chat gorge, MS, 2400 m, 14.7. (1).
2. *Pyrgus centaureae* (RAMBUR, 1839): 28.6.; 2.7. (2). MS. GL.
3. *Pyrgus alveus iliensis* (REVERDIN, 1912): 2.7. (1) GL, Kara-Chat gorge, MS, 2400 m, 14.7. (1).

Papilionidae

1. *Parnassius evermanni lacinia* (HEMMING, 1934): 2., 4., 11.7. (7) MT, GL.
2. *Parnassius phoebus* (FABRICIUS, 1793): 9., 11.7. (6). MT.
3. *Papilio machaon* (LINNAEUS, 1758): 18., 22.6. (2). MS.

Pieridae

1. *Euchloe creusa orientalis* (BREMER, 1864): 29.6. (1) SS.
2. *Pontia edusa* (FABRICIUS, 1777): Kara-Chat gorge, MS, 2400 m, 14.7. (4).
3. *Colias chrysotheme audre* HEMMING, 1933: 30.6. (1) SS.
4. *Colias mongola* ALPHÉRAKY, 1897: 20.6.-25.7. (10). Very common in MS, rare in other biotopes.
5. *Colias tyche* (BOEBER, 1812): 23.6.; 1., 14.7. (4) SS.
6. *Colias thisoa aeolides* GRUM-GRSHIMAILO, 1890: 29., 30.6. (2) SS.

Satyridae

1. *Coenonympha tullia subcaeca* HEYNE IN RÜHL, 1894: 2., 9.7. (2) SS, GL.
2. *Triphysa dohrnii* ZELLER, 1850: 27.6.; 14.7. (8) SS.
3. *Erebia maurisius elwesi* STAUDINGER, 1901: 16.7. (1) SS.
4. *Erebia callias altaiana* STAUDINGER, 1901: 2.7. (2) SS; Kara-Chat gorge, MS, 2400 m 14.7. (2).
5. *Boeberia parmenio* (BOEBER, 1809): 2.7. (3) GL, MT.
6. *Oeneis jutta* (HÜBNER, [1806]): 23., 28.6. (3) SS, GL.
7. *Oeneis norna altaica* ELWES, 1899: 23., 29., 30.6. (6) GL.

Nymphalidae

1. *Cynthia cardui* (LINNAEUS, 1758): 29.6. (1) MS.
2. *Aglais urticae* (LINNAEUS, 1758): 18.6. (1) SS.
3. *Euphydryas iduna sajana* HIGGINS, 1950: 2.7. (3) SS, GL.

4. *Melitaea arcesia minor* ELWES, 1899: 29.6.; 2.7. (2) SS.
5. *Clossiana eunomia asiatica* (STAUDINGER, 1901): 29.6.; 2.7. (2) SS.
6. *Clossiana euphrosyne* (LINNAEUS, 1758): 28.6. (1) SS.
7. *Clossiana freija pallida* (ELWES, 1899): 16.6. (1) SS.
8. *Clossiana dia* (LINNAEUS, 1767): 23., 30.6.; 2.7. (3) SS.
9. *Argynnis aglaja* (LINNAEUS, 1758): 16.7. (1) SS.

Lycaenidae

1. *Lycaena phlaeas* (LINNAEUS, 1761): 4.-18.7. (7) SS.
2. *Cupido osiris* (MEIGEN, 1829): 29.6.-7.7. (6) SS, MS.
3. *Plebeius argyrognomon* (BERGSTRÄSSER, [1779]): 26.6.-23.7. (8) SS.
4. *Plebeius idas* (LINNAEUS, 1761): 3.-18.7. (6) SS.
5. *Polyommatus glandon orbitulinus* (STAUDINGER, 1892): 4.-18.7. (7) SS.
6. *Polyommatus orbitulus sajana* (HEYNE IN RÜHL, 1895): 17.6.-14.7. (7) SS.
7. *Polyommatus icarus* (ROTTEMBURG, 1775): 6.-14.7. (4) SS.
8. *Polyommatus eumedon* (ESPER, [1780]): 2.-7.7. (5) SS.

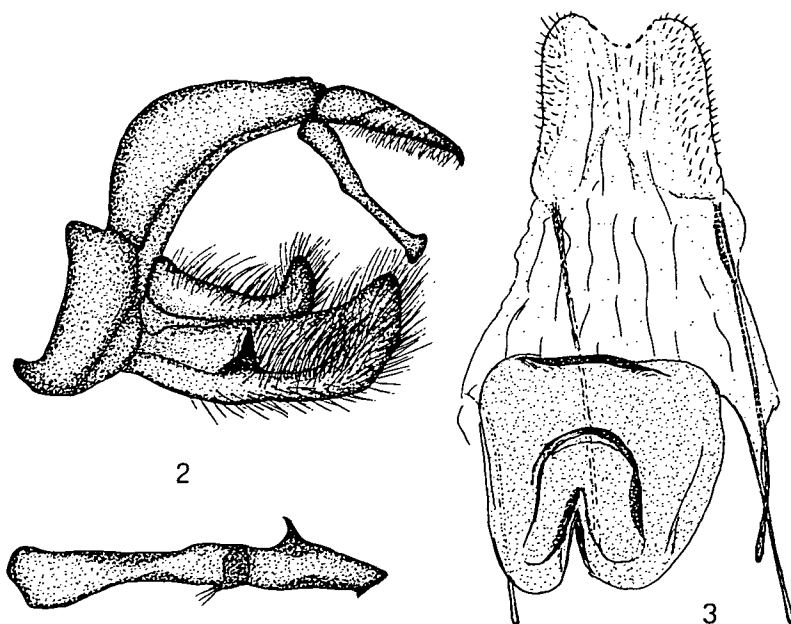


Fig. 2: Male genitalia of *Catoptria fenestratella* (CARADJA, 1928)

Fig. 3: Female genitalia of *Napuca insigna* (ALPHÉRAKY, 1883)

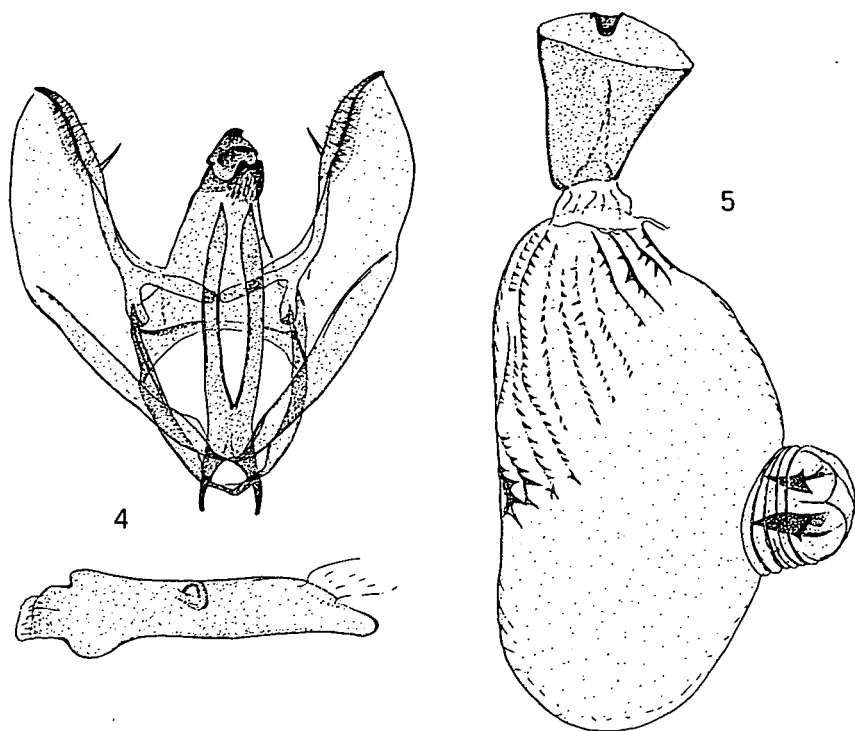


Fig. 4: Male genitalia of *Dysgnophos glaciatus* WEHRLI, 1922

Fig. 5: Female genitalia of *Dysgnophos glaciatus* WEHRLI, 1922

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Literaturbesprechung

MCDONALD, R. 2002: Mr. Darwins unentbehrlicher Gehilfe. - Piper Verlag, München. 413 S.

Charles DARWIN dürfte die wohl am besten dokumentierte naturwissenschaftliche Persönlichkeit des 19. Jahrhunderts sein. Zahlreiche Quellen, Biographien, Tagebücher und Korrespondenzen beleuchten das wissenschaftliche Genie des großen Naturforschers. Über seinen "treuen Diener" Syms COVINGTON gibt es nur wenig Aufzeichnungen: seine unveröffentlichten Tagebücher und verstreute Erwähnungen in DARWINS Briefen und Tagebüchern. Dabei war COVINGTON von 1832 bis 1839 fast ununterbrochen an DARWINS Seite, während der Reise mit der Beagle und der entscheidenden anschließenden zweieinhalb Jahre, in denen sie in London unter einem Dach lebten und DARWIN die privaten Notizen zu seiner Theorie der natürlichen Selektion verfaßte. COVINGTON emigrierte danach nach Australien, wo er mit DARWIN eine Sammlerbeziehung und eine Korrespondenz unterhielt, die mit der Ankunft der "Entstehung der Arten" in Australien und dem bald darauf folgenden Tod von COVINGTON (1861) eine Ende fanden.

Roger MCDONALD ist einer der bekanntesten Schriftsteller Australiens; für den Roman "Mr Darwin's Shooter", der ein Jahr lang auf der Bestsellerliste stand, erhielt er die wichtigsten australischen Literaturpreise. Seine Erzählsprache ist meisterlich, kraftvoll, nie langweilig und einmal begonnen, fällt es somit schwer, das Buch wieder aus der Hand zu geben. Mit großer Leichtigkeit und einfühlsamer Phantasie schildert MCDONALD den Weg des jungen englischen Roßschlächters, der für DARWIN sieben Jahre lang schießt, sammelt, präpariert, etikettiert und verpackt. Trotz einer gewissen Distanz DARWINS gegenüber seinem Gehilfen wird klar, dass COVINGTON ein großer Anteil an den revolutionären Entdeckungen DARWINS zuzuschreiben ist.

Ein opulenter historischer Roman, auf dessen deutsche Übersetzung wir leider vier Jahre warten mußten

R. GERSTMEIER

FLANNERY, T. 2002: Dschungelpfade. Abenteuerliche Reisen durch Papua-Neuguinea. - Malik/Piper Verlag, München. 397 S.

Vor ca. 20 Jahren reiste Tim FLANNERY - damals noch als Student mit seiner Doktorarbeit beschäftigt - zum ersten Mal nach Papua-Neuguinea. Es gab kaum zusammenfassende Literatur über die Tierwelt dieser Insel und Flannery's Idee war, einen dauerhaften Beitrag zur Säugetierkunde Neuguineas zu leisten. Fünfzehn Expeditionen, zwei Abstecher zu Museen in Übersee und unzählige Stunden in Bibliotheken später erreichte er sein Ziel: "Mammals of New Guinea" erschien 1990. Gerade mal etwas über 45 Jahre alt, ist Tim FLANNERY der "Indiana Jones" der Zoologie, beseelt von einem nie zu stillenden Forscherdrang, in Kombination mit Abenteuerlust, Durchhaltevermögen und dem nötigen Quantum Humor. Seine abenteuerlichen Reisen durch Neuguinea führen den Leser in die Naturgewalten dieser tropischen Insel ein, berichten von Begegnungen mit seltenen und gefährlichen Tieren, skurrilen Menschen und beinhalten natürlich die Entdeckungen von "Tenkile" und "Dingiso", jener Baumkänguruhs, welche den Ruhm FLANNERY's über die Grenzen Australiens trugen. Er schildert seine Dschungelreisen in spannender und unwiderstehlich humorvoller Art, ohne die Ehrfurcht vor der Natur und ihrer Bewohner (auch der Menschen) zu verlieren. So erfährt der Leser auch jede Menge

über die Lebensgewohnheiten und Denkweisen der einheimischen Papua-Bevölkerung, die innerpolitischen Verhältnisse und v.a. die Bedrohung der Natur durch Abholzung und rücksichtslose Ausbeutung der Bodenschätze.

Eine abenteuerliche Reise in eines der letzten unerforschten Paradiese - spannend, informativ und humorvoll, aber auch aufrüttelnd.

R. GERSTMEIER

MEHLHORN, H. & PIEKARSKI, G. 2002: Grundriß der Parasitenkunde. - Spektrum Akademischer Verlag, Heidelberg. 6. Aufl., 516 S.

Ziel dieses Lehrbuches im Taschenformat ist es, eine schnelle und fundierte Übersicht über die wichtigen Parasiten von Mensch und Tier zu bieten, ihre Entwicklungszyklen darzustellen und ihre Überlebensstrategien im Wirt aufzuzeigen. Der Aufbau ist - klassisch - nach Tiergruppen in Protisten, Helminthen und Arthropoden gegliedert. Morphologie, Histologie, Entwicklungszyklen sowie Prophylaxe und Bekämpfung werden ausführlich dargestellt, ergänzt durch 184 Abbildungen (mit insgesamt über 700 Detailabbildungen) und 20 Tabellen. Zwar wurde versucht, wichtige Neuerungen und Ergänzungen vorzunehmen, bei der schnell fortschreitenden parasitologischen Forschung ist dies allerdings nicht immer möglich gewesen. So hätte man sich beim "Fuchsbandwurm" doch einige Aussagen mehr gewünscht, da einerseits diese Thematik nach wie vor sehr oft verfälscht durch die Medien geistert, andererseits zahlreiche neue Erkenntnisse (Uni Hohenheim) vorliegen. Aber auch gerade dieses Beispiel zeigt, dass der Kampf gegen Parasiten keinesfalls gewonnen ist und z.T. prophylaktische Maßnahmen eine größere Bedeutung erlangen als die Chemotherapie.

Ein fundiertes Standardwerk der Parasitologie, für Studenten und Fachleute aus den Bereichen Biologie, Veterinär- und Humanmedizin.

R. GERSTMEIER

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