

## Butterflies (Lepidoptera, Diurna) of the Koni Peninsula (Magadan Region),

### Булавоусые чешуекрылые (Lepidoptera, Diurna) полуострова Кони (Магаданская область).

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КЛЮЧЕВЫЕ СЛОВА: дневные бабочки, Магаданская обл., п-ов Кони, биотопическая приуроченность, *Parnassius stubbendorffii* Ménétrière.

ABSTRACT. 28 species of butterflies were collected in July 1989 in the Koni Peninsula (the southern extreme of Magadan Region), including *Parnassius stubbendorffii* Ménétrière, which was thought not to be distributed north of the low reaches of the Amur river. A brief descriptions of landscape and vegetation types of the peninsula is given and the butterfly species inhabiting them are specified.

РЕЗЮМЕ. В сообщении перечислены 28 видов дневных бабочек, отмеченных на полуострове Кони (Магаданская область) в июле 1989 г. Кратко охарактеризованы природные условия и характерные для полуострова типы ландшафтов и растительности, для которых указаны характерные виды бабочек. Низкогорные части речных долин носят лесотундровый характер, они покрыты более или менее разреженными зарослями ольхового и кедрового стланика, встречаются открытые участки, покрытые растительностью лугового и тундрового характера. Здесь обычны *Carterocephalus sikicolus*, *Carterocephalus palaemon*, *Pieris bryoniae sheljuzhkoii*, *Euphydryas intermedia*, *Clossiana selene*, *Clossiana thore*, *Clossiana oscarus*, *Brenthis ino*, *Coenonympha tullia*, *Erebia jennisseiensis*, *Erebia (ligea)*, реже встречаются *Vacciniina optilete*, *Euchloe creusa orientalis*, *Colias palaeno*, *Procllossiana eunomia*, *Clossiana euphrosyne* (ранее не указывался для Магаданской обл.), *Mesoacidalia aglaja*, *Boloria* aff. *aquilonaris*, *Oeneis magna*. На ограниченном участке разнотравного луга в трех километрах вверх по течению от устья р. Хиджа обнаружен *Parnassius stubbendorffii*, который ранее не был известен для Магаданской области и считался распространенным не севернее Нижнего Амура. Высокогорья полуострова покрыты в основном каменистыми осыпями и кустарничковой тундрой, здесь обитают *Synchlora callidice*, *Euphydryas iduna*, *Erebia dabanensis*. На приморских лугах береговой террасы северного побережья встречаются те же виды, что и в речных долинах, но к ним добавляется *Parnassius phoebus*, отмечена также *Aglais urticae*. Терраса южного

побережья покрыта тундрой, но на ее обрыве южной экспозиции, где развита довольно богатая травянистая растительность, обитают *Parnassius phoebus*, *Plebejus tancrei verchojanicus*, *Polyommatus kamtschadalis extremiorientalis* и *Colias hyperborea*.

The butterfly fauna of Magadan Region in general and the ecology of certain species in particular are still insufficiently studied [Kurentzov, 1970, 1974]. While working in a floristic expedition of the Institute of Biology and Pedology of the Far-East Division of the Academy of Sciences of the USSR, on July 6th-26th 1989, the author had an opportunity to collect butterflies and to make some observations on them in the Koni Peninsula, on the territory of the Ola section of the Magadan Nature Reservation. This observations may be helpful in increasing the knowledge of the ecology of butterfly species in North-East Asia.

The Koni Peninsula is situated about 60 km south of Magadan City, being the southern extreme of Magadan Region. It is in fact a mountain range with prevailing altitudes of 800-900 m (the maximal altitude being 1,548 m). The climate is of the oceanic type: the average temperatures of January are -9 — -15°C (the minimal temperature being -28 - -32°C), those of July are +8 - +10°C (the maximal being +18 - +23°C) [Berkutenko et al., 1989]. In summer the coast is frequently covered by fog.

The lowlands of the peninsula correspond to the taiga belt, but the rigorous climate of a land extended into the Okhot Sea prevents the development of larch forest, which covers the neighboring continental coast but is absolutely missing from the studied territory. Only forests of stone birch (*Betula ermanii* Cham. ssp. *lanata* (V. Vassil.) A. Skvorts.) are developed on the slopes of river valleys or, rarely, on coastal slopes, but they hardly reach the altitude of 300 m. Besides, the narrow stripes of Korean willow (*Chosenia arbutifolia* (Pall.) A. Skvorts.) or poplar (*Populus suaveolens* Fisch.) forests are developed alongside the river banks. At greater altitudes, up to 1000-1100 m, the slopes are covered with thickets of the

dwarf pine (*Pinus pumila* (Pall.) Regel), which become 0.5 m high at its upper limit. From the very feet of the slopes, large-stoned screes are frequent.

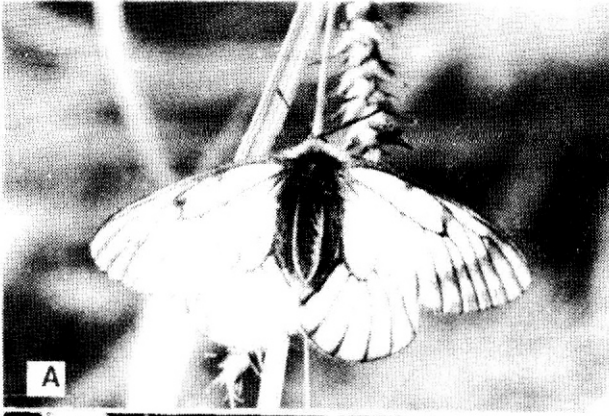
We examined the valleys of the Khindzha and the Burgauli rivers, the former falling into the sea at the northern coast, the latter at the southern one. Their narrow bottom flats are covered with more or less sparse but tall (up to 3 m) and vigorous bushes of the dwarf alder (*Dushekia fruticosa* (Rupr.) Pourar in Precila) or the dwarf pine; the lateral parts of the flats, as a rule, have large heath-like openings. This landscape is close to forest-tundra as the tundra-specific plant species (various Ericaceae, *Empetrum nigrum* L. s.l., etc.) predominate in herbage composition, neighboring with meadow ones, and the ground lichens are very abundant. The lower bushes are represented by *Juniperus sibirica* Burg.sd., several *Salix* species, *Betula divaricata* Ledeb. (mostly at the southern coast), *Spiraea beauverdiana* Schneid., *Pentaphylloides fruticosa* (L.) O.Schwarz, *Lonicera edulis* Turcz. ex Freyn. The majority of butterflies are confined to this openings. These are mostly the characteristic species of the Siberian taiga: *Zarterocephalus silvicolus* (Meigen, 1829), *C. palaemon* (Pallas, 1771), *Pieris bryoniae* (Hübner, 1791) ssp. *sheljuzhkoii* Eitschberger, 1983, *Euphydryas intermedia* (Ménétrières, 1859), *Clossiana selene* (Denis et Schiffermüller, 1775), *C. thore* (Hübner, 1803), *C. oscarus* (Eversmann, 1844), *Brenthis ino* (Rottemburg, 1775) (which fled after July 20th), *Coenonympha tullia* (Müller, 1761), and *Erebia jensiseiensis* Trybom, 1877, were abundant all over the examined valleys. Besides, after July 22th, numerous butterflies of the *Erebia (ligea)* (Linnaeus, 1758) group appeared, the taxonomic attribution of which is now being elucidated [personal communication of P.Yu. Gorbunov, Yu.P. Korschunov, and V.V. Dubatolov]. *Vacciniina optilete* (Knoch, 1781) and *Colias palaeno* (Linnaeus, 1761) were less abundant: the latter was met with, as a rule, in vast openings and burnt-over areas with *Calamagrostis langsdorffii* (Link.) Trin. dominating. Besides, *Proclissiana eunomia* (Esper, 1799) and *Clossiana euphrosyne* (Linnaeus, 1758) (this species has not been reported for Magadan Region [Kurentzov, 1970]) turned out to be frequent in the Burgauli valley. On 17th of July, 2-3 km upstream of the mouth of this river in forest-tundra with lichens and *Empetrum* predominating in the ground vegetation, and *Salix* spp., *Dushekia fruticosa*, and *Betula divaricata* among bushes, there were found young imagines of *Mesoacidalia aglaja* (Linnaeus, 1758) and *Boloria* sp. preliminarily identified as *aquilonaris* (Stichel, 1908), the latter in abundance. The exact identification demands a revision of North Asiatic representatives of the *Boloria (pales)* (Denis et Schiffermüller, 1775) group of genus *Boloria* Moore, 1900. The collected series exhibits a considerable variation of the characters of hind wing underside, such as the degree of development of the dark suffusion in the central band and the intensity of the basic dark-red-brown color, some of the specimens much resembling a typical *B. aquilonaris*, some approaching in appearance the Mongolian/Siberian taxon *Boloria (pales) banghaasi* (Seitz, 1909) [Crosson du Cormier, 1982]. In the upper reaches of the Khindzha river at the wet

stream-side meadow surrounded by dwarf alder bushes, a female of *Euchloe creusa* (Doubleday, 1847) ssp. *orientalis* (Bremer, 1864) was caught; in an opened alder thickets 10 km upstream of the mouth of this river, we also obtained a female of *Oeneis magna* (Graeser, 1888).

A small section of the Khindzha valley flat, about 3 km upstream of its mouth (and roughly 1 km long), is covered by rich mesophytic meadows, containing such plant species as *Calamagrostis langsdorffii*, *Deschampsia borealis* (Trautv.) Roshev., *Carex falcata* Turcz., *Fritillaria camschatcensis* (L.) Ker.-Gawl., *Veratrum oxysepalum* Turcz., *Iris setosa* Pall. ex Link., *Thalictrum kemense* Fries, *Aruncus kamtschaticus* (Maxim.) Rydb., *Geranium erianthum* DC., *Chamerion angustifolium* (L.) Scop., *Anthriscus aemula* (Woron.) Schischk., *Galium boreale* L., *Valeriana capitata* Pall., *Senecio tundricola* Tolm., *S. cannabinifolius* Less., *Saussurea oxyodonta* Hult., *Tanacetum boreale* Fisch. ex DC., *Cacalia hastata* L. It is only this restricted area where rather numerous individuals of *Parnassius stubbendorffii* Ménétrières, 1849, (Fig.1) were observed (on July 8th, 10th, 22th, 25th and 26th). It turns out to be the extreme northern and eastern locality known to this time for *P. stubbendorffii*, which was thought not to range north of the low reaches of the Amur river [Kurentzov, 1970]! The specimens collected have later been described as a new subspecies [Kreuzberg & Pljushch, 1991]. *Corydalis arctica* M.Pop., which was reported for the peninsula [Berkutenko et al., 1989] but not met with by us, might be a larval food plant for this species.

The highlands of the peninsula are mostly covered by large screes and mountain-top detritus with sparse spots of prostrate *Pinus pumila*, or, more rarely, *Dushekia fruticosa*. Cirque bottoms are usually tundra, with Ericaceae species dominating. Flowering *Rhododendron camtschaticum* Pall., which is especially abundant, even color the landscapes with a rose tint. Two butterfly species, *Synchloe callidice* (Hübner, 1799) and *Euphydryas iduna* (Dalman, 1816), are common there at altitudes above 700 m, although they were sometimes met with at subalpine meadows surrounded by dwarf woodland at an altitude of about 500 m. It should be noted that some specimens of *E. iduna* has the traces of black spots in the marginal red band on the underside of the hind wings, which are common in *E. intermedia*, yet, the other traits of the ornament and coloration are characteristic for *E. iduna*. Besides, on July 23th and 24th, at the detritous divide between two cirques at the altitude of 1,100 m, we observed (but failed to catch) several individuals of *Oeneis* sp. and collected a male of *Erebia dabanensis* Erschoff, 1871.

The coastal mountains form abrupt cliffs extended along the long sections of the coastline. Where the mountains step back, a wave-cut terrace is developed. At the northern shore, it is low and covered mostly by *Pinus pumila* dwarf woodland, but in the close vicinity of the shore, the rich coastal meadows are frequent. The same butterflies as in the river valleys fly there (*Pieris bryoniae* being especially numerous), but quite abundant *Parnassius phoebus* (Fabricius, 1793) was added. Besides, on *Urtica angustifolia* Fisch. ex Hornem., growing at the foot of the







terrace, the colonies of *Aglais urticae* (Linnaeus, 1758) larvae were common. On the southern coast, which is subject to much more severe winds and waving, the terraces are covered by a fruticose tundra and are terminated by bluffs 3-6 meter high. There were observed *Colias palaeno*, *Pieris bryoniae*, *Vacciniina optilete*, *Euphydryas iduna*, *Clossiana selene*, *C. euphrosyne*, *Brenthis ino*, *Coenonympha tullia*. The bluffs have the southern aspect, so, notwithstanding the constant wind from the sea, their sparse vegetation is composed of various plant species, including brightly flowering ones: *Leymus mollis* (Trin.) Hara, *Rhodiola atropurpurea* Praeger, *Sedum cyaneum* Rudolph, *Potentilla fragiformis* Willd. ex Schult., *P. rupifraga* Khokhr., *Astragalus alpinus* L., *Oxytropis czukotica* Jurtz., *Senecio pseudoamica* Less., *Artemisia arctica* Less., and others. Such butterflies as *Plebejus tancrei* (Graeser, 1888) ssp. *verkhojanicus* (Kurentzov, 1970), *Polyommatus kamtschadalis* (Sheljuzhko, 1933) ssp. *extremiorientalis* (Kurentzov, 1970), and *Colias hyperborea* Groum-Grshimailo, 1899, were almost confined to these bluffs. They did not penetrate into the tundrous terrace surface; and only rare individuals of these species were met with in the Burgauli valley up to several km upstream from the shore. The legumes *Astragalus alpinus* and *Oxytropis czukotica* might be food plants of the larvae of these species. *Parnassius phoebus* was also common on the bluff. Its food plant must be *Rhodiola atropurpurea*, and, probably, *Sedum cyaneum*. Although the latter species was found apart from the coasts, *Parnassius phoebus* was restricted to them.

We have observed feeding of imagines of *Carterocephalus silvicolus* and *C. palaemon* on the flowers of *Geranium erianthum*, *Rubus arcticus* L.; of *Parnassius phoebus* - on *Scorzonera radiata* Fisch. ex Ledeb.; of *Parnassius stubbendorffii* - on *Senecio tundricola*; of *Colias palaeno* - on *Pentaphylloides fruticosus*, *Scorzonera radiata*; of *Vacciniina optilete* - on *Ledum decumbens* (Ait.) Lodd. ex Steud.; of *Euphydryas intermedia* - on *Spiraea beauverdiana*; of *Boloria* aff. *aquilonaris* - on *Senecio tundricola*;

of *Clossiana thore* - on *Spiraea beauverdiana*, *Geranium erianthum*; of *Brenthis ino* - on *Saussurea oxydonta*; of *Coenonympha tullia* - on *Geranium erianthum*, *Spiraea beauverdiana*; of *Erebia jennisensis* - on *Spiraea beauverdiana*.

Thus, we have collected 28 butterfly species. Although we found two species (*Parnassius stubbendorffii* and *Clossiana euphrosyne*) which were not reported for Magadan Region, the total number of species observed is too small even for a month-long investigation. It is quite possible that the local butterfly fauna is indeed poor because of the severe climate of the peninsula.

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Fig. 1. Butterflies of the Koni Peninsula photographed in natural positions. A-B — *Parnassius stubbendorffii*, males; C — *Parnassius phoebus*, female; D — *Synchlœ callidice*; E — *Colias hyperborea*, male; F — *Colias palaeno*, female; G — *Plebejus tancrei verkhojanicus*, male; H — *Euphydryas iduna*; I-J — *Boloria* aff. *aquilonaris*; K — *Clossiana thore*.

Рис. 1. Дневные бабочки полуострова Кони, сфотографированные в естественных позах. А-В — самцы *Parnassius stubbendorffii*; С — самка *Parnassius phoebus*; D — *Synchlœ callidice*; E — самец *Colias hyperborea*; F — самка *Colias palaeno*; G — самец *Plebejus tancrei verkhojanicus*; H — *Euphydryas iduna*; I-J — *Boloria* aff. *aquilonaris*; K — *Clossiana thore*.

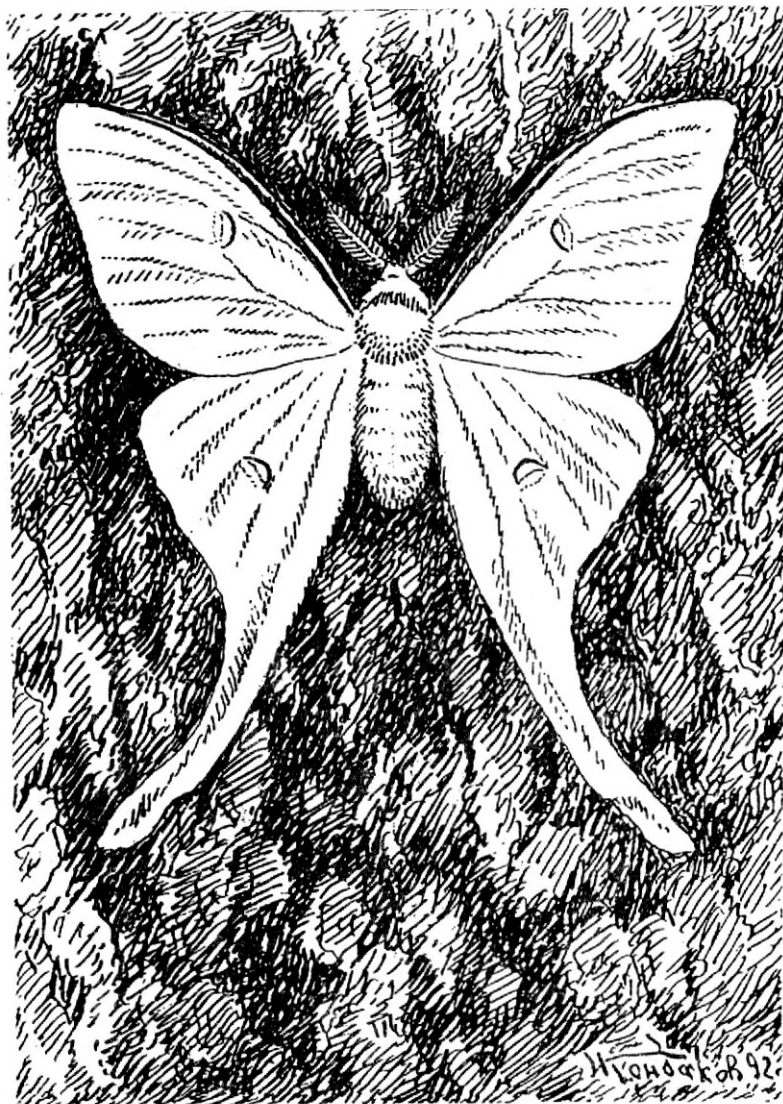
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