A Siberian butterfly species recorded for the first time on the American continent: *Oeneis nanna kluanensis* ssp. n. (Lepidoptera: Nymphalidae, Satyrinae)

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Abstract: During a journey in 1991 a total of 32 butterfly and skipper species were observed in southwestern Yukon, Canada. Among them were three specimens of an undescribed population of *Oeneis nanna* (Ménétriés, 1859), which had so far been known only from Siberia and Central Asia. Their correct taxonomic status was only recognized ten years after collection, following the availability of new literature and comparison with material from Siberia. Due to their quite distinct habitus these specimens are described as *Oeneis nanna **kluanensis*** M. Hassler **ssp. n.** In an appendix the other butterfly records for the type locality and the adjacent southwestern Yukon territory are listed, commented and compared with literature data.

Eine sibirische Tagfalterart zum ersten Mal vom amerikanischen Kontinent nachgewiesen: *Oeneis nanna kluanensis* ssp. n. (Lepidoptera: Nymphalidae, Satyrinae)

Zusammenfassung: Während einer Sammelreise im Jahr 1991 konnte eine Gesamtzahl von 32 Tagfalter- und Dickkopffalterarten im südwestlichen Yukon-Territorium, Kanada, beobachtet werden. Darunter befanden sich 3 Exemplare einer neuen Unterart von *Oeneis nanna* (Ménétriés, 1859). Diese Art war bisher nur aus Sibirien und Zentralasien bekannt. Ihre korrekte Identität konnte erst zehn Jahre nach dem eigentlichen Funddatum geklärt werden, nachdem neuere Literatur publiziert war und nachdem genügend Vergleichsmaterial aus Sibirien vorlag. Wegen ihres deutlich abweichenden Habitus wird die Population als *Oeneis nanna **kluanensis*** M. Hassler **ssp. n.** beschrieben. In einem Anhang werden die anderen am Typusfundort und im südwestlichen Yukon beobachteten Arten aufgelistet, kommentiert und mit den Literaturdaten verglichen.

Introduction

Alaska (U.S.A.) and the Yukon territory (Canada) form one of the most species-rich areas in the northern holarctic region (the "Eastern Beringian Zone"); Lafontaine & Wood (1997) list no less than 88 butterfly species for the Yukon. Especially the Yukon region contains a great diversity of habitats, which is very evident in the northernmost localities for some boreal zone species. Lafontaine & Wood (1997) use the very fitting term "treasure house for arctic butterflies". The richness of the region is partially based in the favorable climate, sheltered by the glaciers of Kluane National Park.

A large number of butterfly and moth species occur in both Siberia and Alaska/Yukon, having a true holarctic distribution. Many of them have been described separately on both continents (sometimes several times!). The paucity of available Siberian material and the poor availability of the Russian publications in the western world severely hampered the treatment of holarctic, species-rich butterfly genera, like *Oeneis* Hübner, [1819], *Erebia* Dalman, 1816, and *Boloria* Moore, 1900.

Today, this picture has changed completely. More and more Siberian material is available in long collection series and perfectly pictured in recent publications. Therefore it was not surprising that finally several "species pairs" have been recognized as one and the same (to mention only a few: *Oeneis alpina* Kurentzov, 1970 – *Oeneis excubitor* Troubridge et al., 1982, *Erebia anyuica* (Kurentzov, 1966) – *Erebia occulta* Roos & Kimmich, 1983, *Colias tyche* Böber, 1812 – *Colias boothii* Curtis, 1835 and possibly *Colias johanseni* Troubridge & Philip, 1990 – *Colias hyperborea* Grum-Grshimailo, 1900). However, in some *Oeneis* groups a lot of taxonomic uncertainties and "unsolved names" remain (*Oeneis oeno* Boisduval, 1832 – *also* Boisduval, 1832 – *melissa* (Fabricius, 1775), the group of *Oeneis polixenes* (Fabricius, 1775), *Oeneis taygete* (Schneider, 1792) – *bore* (Esper, 1790), *Oeneis rosovi* Kurentzov, 1970 – *philipi* (Troubridge et al., 1988) – *norna* (Thunberg, 1791), etc.).

The group of *Oeneis nanna*

This group consists of several predominantly Siberian taxa:

- *Oeneis nanna* (Ménétriés, 1859) [Transbaicalia, Amur, NE-Mongolia, NE-China: Manchuria], with the subspecies *anna* (Austaut, 1911) [S-Tuva, N-Mongolia], *dzhulukuli* Korshunov, 1998 [SE-Altai, W-Tuva], and *jakutski* Korshunov, 1998 [Yakutia, NE-Siberia].
- *Oeneis* [*nanna* ssp.] *dzhugzhuri* Sheljuzhko, 1929 [Khabarovsk, Magadan, NW-Amur], sometimes treated as a separate species.
- *Oeneis* [*nanna* ssp.] *brunhilda* A. Bang-Haas, 1912 [Sayan, Tuva, Mongolia to C-Yakutia], inconsistently treated as a separate species or a synonym of *nanna anna*.
- *Oeneis sculda* Eversmann, 1851 [Altai, Tuva, Sayan, Buryatia, NE-Mongolia], with the subspecies *pseudosculda* Korshunov, 1997 [C-Mongolia] and *vadimi* Korshunov, 1995 [N-Transbaicalia, Yakutia].
- *Oeneis urda* Eversmann, 1847 [N-Altai, S-Siberia, Amur, Transbaicalia, Sayan, Ussuri, Primorye, Yakutia, N-Mongolia, NE-China], with the subspecies *tschiliensis* O. Bang-Haas, 1933 [NE-China: Jilin prov.] and *monteviri* Bryk, 1946 [North Korea].

- *Oeneis* [*urda* ssp.] *mongolica* (Oberthür, 1876) [Mongolia, N-China: Nei Mongol, Liaoning provinces], frequently treated as a separate species, with the subspecies *hoenei* Gross, 1970 [China: Shanxi prov.], *coreana* Matsumura, 1927 [North Korea], *walkyria* Fixsen, 1887 [South Korea] and *hallasanensis* Murayama, 1990 [Cheju Do Island].
- *Oeneis diluta* Lukhtanov, 1994, of Central Asia (Sayan, Tuva).

and a single North American species:

- *Oeneis uhleri* Reakirt, 1866, [Rocky Mountains from the Yukon to southwestern USA], with the sometimes weakly defined subspecies *uhleri* s. str. [NE-Colorado, Wyoming], *varuna* Edwards, 1882 [W-Canada, NW-USA], *nahanni* Dyar, 1904 [N.W. Territories], *cairnesi* Gibson, 1920 [Yukon, NE-Alaska], and *reinthali* F. M. Brown, 1953 [W-, SC-Colorado].

Lukhtanov & Eitschberger (2000, 2001) also include the more distantly related and quite distinct Siberian/Central Asian species pair *Oeneis tarpeja* (Pallas, 1771) and *Oeneis lederi* Alphéraky, 1897 into this group, which they consequently named after the oldest described species "*O. tarpeja* group".

Unlike the "true tundra species", like *Oeneis bore* Esper, 1790 and *Oeneis polixenes* Fabricius, 1775, the members of the *nanna*-group show a more southerly and mostly boreal distribution and are distributed in the Old World widely in the Central Asian mountains (southwest to Kazakhstan) and in the New World along the Rocky Mountains south to New Mexico.

Lately, the known range of two species in Asia has been significantly expanded by new observations over the last years, and includes now northeastern Siberia: *Oeneis nanna jakutski* Korshunov, 1998 flies in several locations in the Chukot peninsula and in Yakutia; *Oeneis sculda vadimi* Korshunov, 1995 was described from NE-Siberia.

However, no member of the *nanna*-group has so far been confirmed to be truly holarctic. The northernmost locality of the American *Oeneis uhleri cairnesi* Gibson, 1920 lies in the northern Yukon.

The discovery of *Oeneis nanna* in the Yukon

In early to late July 1991 the senior author travelled for about three weeks through Alaska and the Yukon, joined by Dr. Gert Schwiethal (now Lübeck, Germany). The observed butterfly fauna was generally poor in numbers, since the preceding June had seen an extensive heat period, followed by intermittent cold and rain in July, and most species had already expired or were well through their peak season.

During the end of our tour, returning from Whitehorse to Fairbanks, the region of Lake Kluane was visited. Along the northern slope of the Mt. Logan mountain massive and the Kluane National Park lie some faunistically and floristically very rich habitats, which are unusual because of their fairly dry climate. The extremely high Mt. Logan glacier field shields most of the ocean humidity from the interior. The quite spectacular and unexpected occurrence of sand dunes near Whitehorse illustrates this significant dryness.

In the favorable climate north and east of the Mt. Logan area many plant and animal species reach their northernmost distribution on the American continent.

On July 14th/15th we visited the valley of upper Quill Creek, a few miles northwest of Burwash Landing. This valley can be reached by a former mining dirt road, being in a fairly bad state, but barely manageable (at least in 1991). It leads up to about 1000 m altitude, where a flat valley bottom of an old glacier valley with scrubby vegetation (mostly willows, *Salix* spp., Salicaceae, and tundra rose, *Potentilla fruticosa* L., 1753, Rosaceae) is reached. From here several botanically very rich slopes and mountains may be climbed.

The weather was generally cold and rainy and cleared up only for a few hours during the morning, but as soon as the sun was out, a surprising number of butterflies could be observed. Quill Creek turned out to be the most species-rich habitat we saw in the Yukon, closely followed only by the shores of Lake Laberge nearby.

Among the many species seen were three fresh specimens (♂♂) of an unidentified *Oeneis*. Lacking a better theory and comparative material, they got preliminary labels as "*Oeneis uhleri* 'unknown ssp.'", but it was obvious from the beginning that they did not fit very well within this species. They show no close connection especially to the pale northern *Oeneis uhleri cairnesi*.

Following the publication of several more recent works about *Oeneis* or the butterflies of the Yukon over the last years (Tuzov 1997, Lafontaine & Wood 1997, Layberry et al. 1998, Lukhtanov & Eitschberger 2000, 2001), the task of correct identification was taken up again, and finally led to a surprising discovery: the specimens in question belong to *Oeneis nanna* (Ménétriés, 1859). Their habitus, however, is quite different from the Siberian populations of the species. They are much smaller and paler. Only one ♂ pictured in Lukhtanov & Eitschberger (2000: pl. 17, fig. 25) resembles the Yukon specimens more closely, but it is larger and more deeply colored, too. The three Yukon specimens are very homogeneous in their appearance and suggest a general and significant difference to Siberian populations.

The correct assignment to *Oeneis nanna* could finally be confirmed by comparison of the ♂ genitalia to all other species of the *nanna*-group. The genitalia of both *O. nanna jakutski* (Fig. 32) and *O. nanna nanna* (Fig. 34) are fully identical with *O. nanna kluanensis* (Fig. 31), and absolutely no differences can be found. In contrary, all examined genitalia of *O. uhleri* populations (examples see Figs. 33 and 35) show slight differences from *O. nanna*, which are very consistent. However, the close

relationship of *O. nanna, O. sculda* and *O. uhleri* as a natural group is obvious.

We do not want to artificially increase the already confusing "name game" in *Oeneis*, but the habitus difference of the populations is significant, and the geographic distance between the known American and Siberian localities is considerable. We describe the Yukon specimens in question therefore (although with some reluctancy) as a new subspecies of *Oeneis nanna*. It might very well be that other *"O. uhleri"* populations of the Yukon will finally turn out to be true *O. nanna*.

Oeneis nanna kluanensis M. Hassler ssp. n.

Holotypus: ♂, SW-Yukon, NW Burwash Landing, Quill Creek Area, 800–1200 m altitude, 15. VII. [19]91, leg. M. Hassler. To be deposited in coll. Forschungsinstitut und Natur-Museum Senckenberg (Frankfurt am Main, Germany), SMFL-no. 4207 (see Figs. 4, 19, 31).

Paratypes: 2 ♂♂, same data as holotype, in coll. M. Hassler (Bruchsal, Germany) (see Figs. 5–6, 20–21).

Derivatio nominis: The subspecific name comes from the Kluane region, in which the type locality is situated.

Description (see Figs. 4–6, 19–21)

♂: Forewing length 20–21 mm. Color light reddish-brown (much lighter than in nominate subspecies). Upperside: eyespots virtually absent, only some very small spots visible. Veins and cubital cell lightly emphasized by brown color, but not as dark as in the Asian populations. Underside of hindwing: mottled white and brown with a prominent, irregularly zig-zagged dark brown band. Borders of this band to the the surrounding whitish area very clear (unlike *O. uhleri*, where the band is straighter, but its borders are mottled).

♀: unknown.

Habitat (Figs. 38, 39)

O. nanna kluanensis ssp. n. flies in grassland habitat, which is partly covered by low shrubs (dominated by willows and the cinquefoil *Potentilla fruticosa,* Rosaceae). The altitude is near tree line. On the lower slopes of the surrounding mountain slopes we find some thin conifer forests, which quickly give way to floristically rich tundra on the upper slopes. The specimens were flying low and erratically along the edges of a dirt road (Fig. 39) and were resting on patches of bare ground, behaving very similar to other *Oeneis*-species.

Flight time

The fresh condition of all three collected specimens at July 15th suggest a comparably late flight period for an *Oeneis* species. The available Siberian comparison material of *O. nanna* in coll. Hassler and the data in Lukhtanov & Eitschberger (2000) confirm flying times of mostly July, only rarely June, for *O. nanna jakutski* in NE-Siberia. This late flight period may be an explanation why the species has so far not been observed in the Yukon — usually *Oeneis* peak season is mid- to late June.

Other possible habitats

Along the northern slopes of the Mt. Logan mountain massive and in adjacent eastern Alaska we should find many suitable habitats for *Oeneis nanna kluanensis*. The poor accessibility of most regions (and maybe the late flying period, as speculated above) are most likely the reason why this distinct butterfly has not been found earlier. We expect therefore that more localities will be found within the foreseeable future, and it might very well be that hitherto unrecognized collection material can be identified.

Species figures, uppersides: The high variability of *Oeneis* populations can be illustrated only poorly with a limited number of figures. We encourage the reader to consult especially the treatment of Lukhtanov & Eitschberger (2000) for many more illustrations.

Diagnostic differences and comparison to other species of the *nanna*-group

***Oeneis nanna jakutski* Korshunov, 1998** (Figs. 7–8, 22–23): This subspecies is generally larger and much darker than *O. nanna kluanensis* ssp. n. Most specimens have well developed rows of eyespots on both fore- and hindwings. Only very rarely an odd specimen with few eyespots, similar to *O. nanna kluanensis* ssp. n., may be encountered (see plate 17, fig. 25 in Lukhtanov & Eitschberger 2000), but their color is darker. The genitalia are identical to *O. nanna kluanensis* ssp. n.

***Oeneis nanna nanna* (Ménétriés, 1859)** (Figs. 10–11, 25–26) and *Oeneis nanna anna* (Austaut, 1911): Both are populations of Central Siberia, Mongolia and the Central Asian mountains. They are large, red-brown to brightly ochre colored and have well developed eyespots. Their habitus, although variable, is very different from *O. nanna kluanensis* ssp. n. and would suggest no close relationship at first sight. Genitalia are, however, very similar to *O. nanna kluanensis* ssp. n.

***Oeneis* (*nanna* ssp.) *brunhilda* A. Bang-Haas, 1912:** This taxon is synonymized with *O. nanna anna* by Lukhtanov & Eitschberger (2001), but treated as a separate species with later flight period by Tuzov (1997, see figure there). It seems to be slightly smaller and paler than *O. nanna*, but has no obvious relationship to the Yukon population, too.

***Oeneis uhleri cairnesi* Gibson, 1920:** This northernmost *uhleri*-subspecies of the Yukon and NE-Alaska is paler and much more yellowish than *O. nanna kluanensis* ssp. n. (see figures in Howe 1975, which agree very much with the more southern *O. uhleri* populations), and also larger and paler than the more southern *Oeneis uhleri varuna* Edwards, 1882. *O. uhleri* has a slightly, but distinctly different genital from *O. nanna* (see Figs. 33, 35).

The underside hindwing pattern is also different: in *uhleri* it has a "striped" appearance, and the dark band in

the center is mottled and weakly defined. In the few specimens of *uhleri,* where this dark band is better visible, it has a fairly straight border. The distinct and in most cases prominent dark band in *nanna* has irregular white zigzagged borders (compare Figs. 16 and 19!). The dark striped pattern of upperside forewing in *O. nanna*, especially around the discoidal cell, is quite different from *uhleri*. *O. uhleri* displays a more "checkered" habit on the upperside, *O. nanna* has a more uniform color display.

The specimen pictured in Layberry et al. (1998) poses a problem, however. It is lightly ochre colored, but the hindwing underside patterns point more to *O. nanna kluanensis* than to *O. uhleri*. We cannot exclude that this specimen belongs to *O. nanna*, too, and it should be checked subsequently. It is furthermore very well possible that *"O. uhleri cairnesi"*-material in collections consists of both *uhleri* and *nanna.*

***Oeneis uhleri nahanni* Dyar, 1904:** A little known population from Mackenzie Mts. in southeastern Yukon/ southwestern N.W. Territories, being very dark and habitually very distinct from *O. nanna kluanensis* ssp. n. and *O. uhleri cairnesi*. See figures in Howe (1975).

***Oeneis* (*nanna* ssp.) *dzhugdzhuri* Sheljuzhko, 1929:** This taxon flies in Eastern Siberia (Amur, Magadan). It is pictured in Tuzov (1997). The ground color is greyish, the eyespots small or nonexistent. Slight differences in genitalia and the very distinct habitus suggest a status as a separate species (Tuzov 1997). Regional separation, differences in genitalia and habitus do not suggest any connection to *O. nanna kluanensis* ssp. n.

***Oeneis sculda* Eversmann, 1851:** This unmistakable species has very different genitalia (see plate and figures in Lukhtanov & Eitschberger 2000 and Tuzov 1997). *Oeneis sculda* has a more "spotty" and checkered appearance, the ground colour is yellowish (*O. sculda sculda*), very light yellowish (*O. sculda pseudosculda*) or yellowish-greyish (*O. sculda vadimi,* Figs. 9, 24). The northeastern ssp. *vadimi* is treated solely as a color morph of the nominate ssp. by Tuzov (1997).

The comparison of the other known taxa of the group from Siberia confirms that the closest relative of the Yukon population is *O. nanna yakutski,* but even that population is habitually very much different.

Other butterfly records for the Kluane region

We take the opportunity to list the other observed butterfly species in the Kluane region ("Region 12" in Lafontaine & Wood 1997), compare it to the records in Layberry et al. (1998) as well as Lafontaine & Wood (1997), and add some comments.

1. Species flying in the Quill Creek area together with *O. nanna kluanensis* ssp. n.

Hesperiidae

Hesperia comma manitoba (Scudder, 1874) — Common Branded Skipper: Quite frequent, more than 10 specimens observed; also in the Destruction Bay area.

Pieridae

Colias canadensis Ferris, 1982 — Canada Sulphur: Fairly frequent, ♂♂ were much more abundant. The species was in mid-July still in the high season, and fresh specimens could be seen.

Colias hecla hecla Lefèbvre, 1836 — Hecla Sulphur: 2 ♂♂ in tundra habitat on a mountain slope above the Quill Creek area, flying here obviously in higher altitudes than *C. canadensis*, and being separated by habitat.

Colias palaeno chippewa W. H. Edwards, 1872 — Palaeno Sulphur: 2 battered ♂♂ in the scrubby willow habitat in the valley, suggesting that peak season was already over.

Pieris angelika Eitschberger, 1981 — Arctic White: Fairly frequent along Quill Creek. Seen also in many other places in the Yukon and Alaska. A very distinct species, which can be recognized in the field quite easily.

Pontia occidentalis (Reakirt, 1866) — Western White: 1 slightly worn ♀. Seen also in other places in the Alaska and Yukon, but mostly solitary, never in large numbers.

Lycaenidae

Cupido (Everes) amyntula albrighti Clench, 1944 — Western Tailed Blue: 1 ♂.

Glaucopsyche lygdamus couperi Grote, 1873 — Silvery Blue: 3 ♂♂. Probably widespread and frequent. Peak season earlier in the year.

Nymphalidae

Boloria (Clossiana) chariclea grandis (Barnes & McDunnough, 1916) transitional to *B. (C.) chariclea butleri* (W. H. Edwards, 1883) — Arctic Fritillary: One of the most abundant butterflies in the Quill Creek Area. It was observed in great numbers and also in several other places in the Lake Kluane region, mostly along the mountains. Lafontaine & Wood (1997) describe in detail the former confusion around those taxa: the populations formerly called *"B. titania"* of the Rocky Mountains (including *B. "titania" grandis*) superficially resemble the Old World *B. titania* (Esper, 1793), but have no connection to true *titania* and need to be regarded as boreal (southern) subspecies of *B. chariclea*. The populations of the Lake Kluane region show all kinds of transitions between "true tundra" *B. chariclea butleri* and "boreal woodland" *B. chariclea grandis*. This suggests secondary hybridization between both taxa, perhaps facilitated by recent range extension of *B. chariclea grandis* (Lafontaine & Wood

1997). Along Quill Creek we find a typical contact area between higher mountain tundra habitats for *B. chariclea butleri* and scrubby woodland areas, where the boreal *B. chariclea grandis* dominates.

Boloria (Proclossiana) eunomia denali (Klots, 1940) — Bog Fritillary: Moderately frequent, 3 ♂♂ and 3 ♀♀ seen.

Boloria (Boloria) frigga saga (Staudinger, 1861) — Frigga Fritillary: 1 very worn ♀. The species flies probably earlier (in June). The scrubby willows in Quill Creek suggest a potentially good habitat for the species.

Oeneis bore hanburyi Watkins, 1928 (= *mackinleyensis* dos Passos, 1949) — White-veined Arctic: Quite abundant, more than 20 specimens seen. The species is very variable in the Quill Creek area and other nearby places, and the theory of Ferris (cited in Lafontaine & Wood 1997) who believes that two species are involved in this complex, is very much plausible.

Coenonympha tullia kodiak W. H. Edwards, 1869 (= *yukonensis* Holland, 1900) — Common Ringlet: Frequent, more than 10 ♂♂ seen. Sometimes treated as separate species.

Erebia discoidalis mcdunnoughi dos Passos, 1940 — Red-disked Alpine: Only 1 ♂ seen.

Erebia mancinus (Doubleday & Hewitson, [1849]) — Taiga Alpine: Only 1 ♀ found. In the area probably not rare.

Erebia theano alaskensis Holland, 1900 — Theano Alpine: Abundant, more than 50 specimens seen, flying all over the place.

Together with *O. nanna kluanensis* ssp. n. we observed in only half a day of good weather a total of 16 butterfly and 1 skipper species, which amount to about 20% of the total butterfly and skipper fauna (89 species) of the Yukon. This shows the extreme richness of the habitat. Three species (*Erebia mancinus, Erebia theano* and *Coenonympha tullia kodiak*) were not listed for the Kluane region ("Region 12") in Lafontaine & Wood (1997), however, Layberry et al. (1998) already show map dots for this area. Additional field work in the area will doubtless further increase the number of known species.

2. Species observed along Lake Laberge and in the northern Kluane region

The 17 species records of Quill Creek were completed by 15 further species observations in the nearby habitats:

Papilionidae

Papilio machaon aliaska Scudder, 1869 — Old World Swallowtail: Several specimens seen hilltopping along dry hills in the northern Kluane NP.

Pieridae

Colias christina kluanensis Ferris, 1981 — Christina Sulphur: Fairly frequent in grassland habitats along Lake Laberge.

Colias philodice Godart, [1819] — Clouded Sulphur: 1 ♀ near Lake Laberge.

Lycaenidae

Lycaena dorcas arcticus (Ferris, 1977) — Dorcas Copper: Scattered along the shores of Lake Laberge.

Lycaena phlaeas feildeni (McLachlan, 1878) — American Copper: Scattered near Destruction Bay in prairie-like dry habitats.

Plebeius (Plebeius) idas alaskensis (F. H. Chermock, [1945]) — Northern Blue: Frequent along the shores of Lake Laberge.

Plebeius (P.) saepiolus amica (W. H. Edwards, 1862) — Greenish Blue: Quite frequent along Lake Laberge in grassland.

Plebeius (Vacciniina) optilete yukona (Holland, 1900) — Cranberry Blue: Scattered in bogs along the highway between Burwash Landing and the Alaska border.

Plebeius (Agriades) glandon franklinii (Curtis, 1835) — Arctic Blue: Several ♂♂ seen on rocky hills near Destruction Bay. Frequently treated as a separate species.

Nymphalidae

Euphydryas chalcedona anicia (Doubleday & Hewitson, [1848]) — Variable Checkerspot: Flying on dry hills and hummocks with steppe-like vegetation in the northern Kluane NP, occurring with its foodplants *Castilleja* and *Penstemon* (Scrophulariaceae).

Phyciodes pratensis pratensis (Behr, 1863) — Field Crescent: Scattered along the shores of Lake Laberge.

Argynnis mormonia opis (W. H. Edwards, 1874) — Mormon Fritillary: Only one ♂ near the shores of Lake Laberge. The species flies here near its northern limits.

Limenitis arthemis rubrofasciata (Barnes & McDunnough, 1916) — White Admiral: Only scattered individuals near woodland, along the highway close to the Alaskan border.

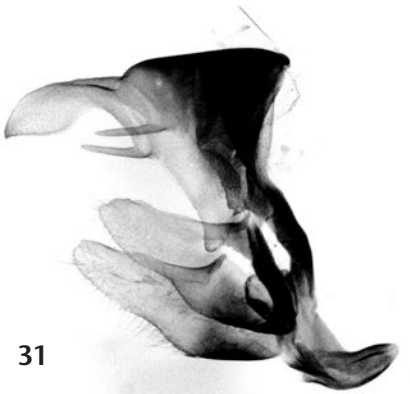
Oeneis jutta alaskensis Holland, 1900 — Jutta Arctic: In woodlands between Lake Laberge and Whitehorse. We saw only very few worn specimens. Peak season is much earlier in the year.

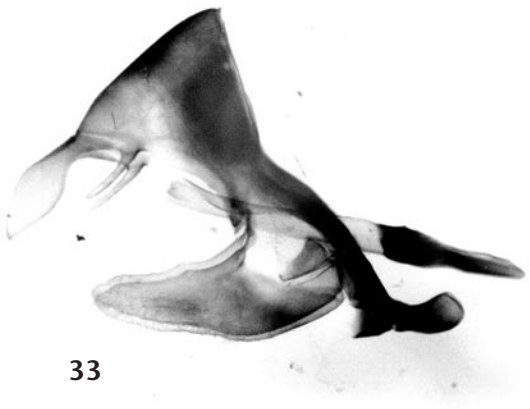
Oeneis chryxus caryi Dyar, 1904 — Chryxus Arctic: Seen rarely near Destruction Bay. This is the northernmost subspecies of *O. chryxus*, being small and pale.

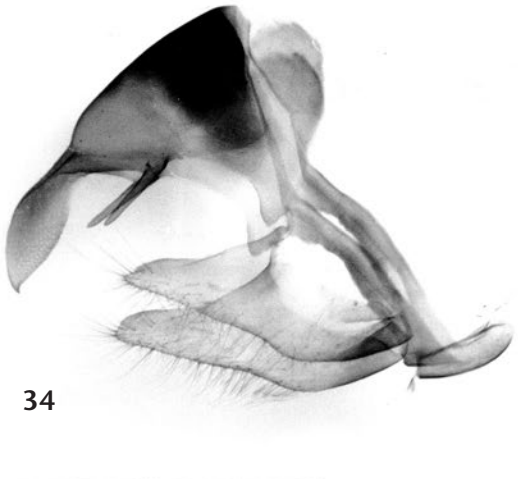
Fig. 1: *Oeneis uhleri uhleri* Reakirt, 1866. USA, Wyoming, Johnson Co., SW Buffalo, 3. vi. 1988. **Fig. 2:** *Oeneis uhleri varuna* Edwards, 1882. Canada, Alberta, Rocky Mts., Red Deer River River, 25 km west of Forestry Trunk Road, 1. vii. 1982, leg. J. Reichel. **Fig. 3:** *Oeneis uhleri reinthali* F. M. Brown, 1953. USA, Colorado, Lake Co., Weston Pass, West Ramp, 2850 m, 26. vii. 1995, leg. M. Hassler. **Fig. 4:** *Oeneis nanna kluanensis* ssp. n., holotypus ♂. Canada, Yukon, NW Burwash Landing, Quill Creek Area, 15. vii. 1991, 800–1200 m, leg. M. Hassler. **Figs. 5–6:** *Oeneis nanna kluanensis* ssp. n., paratypes ♂♂. Same data as holotype. **Fig. 7:** *Oeneis nanna jakutski* Korshunov, 1998. USSR, Yakutia, Yakutsk, 14.–18. vii. 1987, J. Volák leg. **Fig. 8:** *Oeneis nanna jakutski* Korshunov, 1998. USSR, Yakutia, Yakutsk, 6. vi. 1990, coll. L. Bieber. **Fig. 9:** *Oeneis sculda vadimi* Eversmann, 1851. USSR, Yakutia, Yakutsk, 14.–18. vii. 1987, J. Volák leg. **Figs. 10–11:** *Oeneis nanna nanna* Ménétriés, 1859. Russia, Burjatien, Mittellauf d. Flusses Tjomnik, 800 m, 18. vi. 1993. **Fig. 12:** *Oeneis sculda sculda* Eversmann, 1851. USSR, Siberia, Altai Mts., Aktash, 2500 m, 26. v. 1991, leg. Vodjanov. **Figs. 13–14:** *Oeneis*

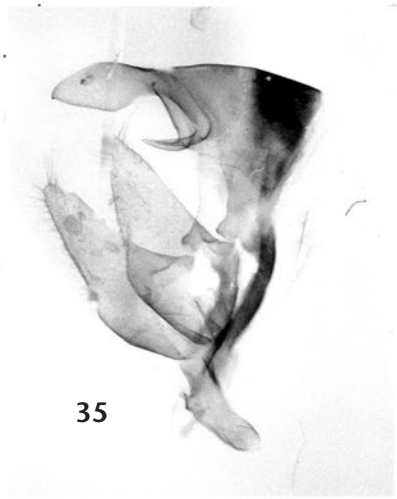
urda urda Eversmann, 1847. USSR, Primorje, Ussuri Region, Gornotajomnoje, 24. v. 1989. **Fig. 15:** *Oeneis* [*urda* ssp.] *mongolica* (Oberthür, 1876). Mongolia, Central aimak Bogdo ul, Bugijn az schuj, 1650 m, Exp. Dr. Z. Kaszab, 1967.

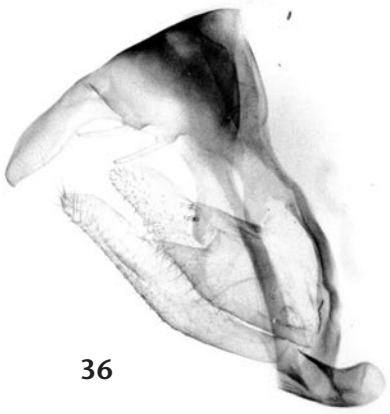
Fig. 16: *Oeneis uhleri uhleri*, underside of Fig. 1. **Fig. 17:** *Oeneis uhleri varuna*, underside of Fig. 2. **Fig. 18:** *Oeneis uhleri reinthali*, underside of Fig. 3. **Fig. 19:** *Oeneis nanna kluanensis* ssp. n., holotypus ♂, underside of Fig. 4. **Figs. 20–21**: *Oeneis nanna kluanensis* ssp. n., paratypes ♂♂, undersides of Figs. 5–6. **Fig. 22**: *Oeneis nanna jakutski*, underside of Fig. 7. **Fig. 23**: *Oeneis nanna jakutski*, underside of Fig. 8. **Fig. 24**: *Oeneis sculda vadimi*, underside of Fig. 9. **Figs. 25–26**: *Oeneis nanna nanna*, undersides of Figs. 10–11. **Fig. 27**: *Oeneis sculda sculda*, underside of Fig. 12. **Figs. 28–29**: *Oeneis urda urda*, undersides of Fig. 13–14. **Fig. 30**: *Oeneis [urda* ssp.] *mongolica*, underside of Fig. 15. — All specimen photographs M. Hassler.











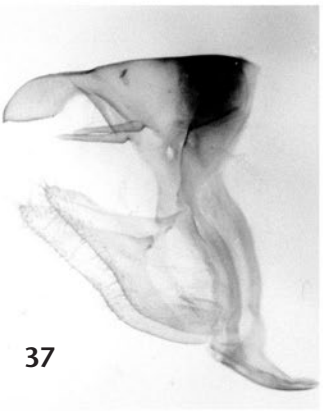


Fig. 31: *Oeneis nanna kluanensis* ssp. n., holotypus ♂. **Fig. 32:** *Oeneis nanna jakutski* Korshunov, 1998. USSR, Yakutia, Yakutsk, 6. vi. 1990, coll. L. Bieber. **Fig. 33:** *Oeneis uhleri uhleri* Reakirt, 1866. USA, Wyoming, Johnson Co., SW Buffalo, 3. vi. 1988. **Fig. 34:** *Oeneis nanna nanna* Ménétriés, 1859. Russia, Burjatien, Mittellauf d. Flusses Tjomnik, 800 m, 18. vi. 1993. **Fig. 35:** *Oeneis uhleri varuna* Edwards, 1882. Canada, Alberta, Red Deer River Xing, Forest Trunk Road, 29. vii. 1991, leg. Anweiler. **Fig. 36:** *Oeneis urda urda* Eversmann, 1847. USSR, Primorje, Ussuri Region, Gornotajomnoje, 24. v. 1989. **Fig. 37:** *Oeneis sculda vadimi* Eversmann, 1851. USSR, Yakutia, Yakutsk, 14.–18. vii. 1987, J. Volák leg. — Genitalia photographs H. Feil.

Fig. 38: Canada, Yukon, Upper Quill Creek, 15. vii. 1991. The flat valley bottom is covered with moraine debris. Vegetation consists of grassland and low shrubs, largely the yellow-flowered tundra rose (*Potentilla fruticosa* L., Rosaceae). The lower slopes of the adjoining mountains are covered with scattered conifers. Type locality to the left of the picture. **Fig. 39:** Upper Quill Creek, 15. vii. 1991. Type locality of *Oeneis nanna kluanensis* ssp. n., which was flying along this dirt road. — Photographs M. Hassler.

Proposed conservation measures

The high butterfly and habitat diversity, which is connected to an equally rich flora, suggest future protection measures for the upper Quill Creek Area. However, since the former mining activities seem to have ceased, an obvious threat was not existing during the visit of the senior author in 1991.

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[**Cautionary address:** Internet addresses are notoriously unstable. The authors recommend the use of a search engine to confirm the validity of the addresses listed. The sites are listed as of October 2001.]

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