

Atalanta (May 1999) 29(1/4): 107–124, colour plates VIII, IX, Würzburg, ISSN 0171-0079

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## New taxa of butterflies from Transbaikalia, Russia

(Rhopalocera: Satyridae, Nymphalidae)

by

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received 3.XII.1998

**Summary:** *Erebia dabanensis chingiza* subsp. nov., *Erebia kefersteini amica* subsp. nov., *Erebia erinny chara* subsp. nov., *Oeneis norna radnaevi* subsp. nov., *Boloria alaskensis bato* subsp. nov., *Clossiana erda puella* subsp. nov. and *Boloria purpurea* spec. nov. are described from the Barguzin and Kodar Mountains (Transbaikalia). The status of the species *Erebia erinny* WARREN, 1932 was confirmed by the characteristic of its genitalia. The status of *Erebia troubridgei* DUBATOLOV, 1992 is under discussion.

**Резюме:** *Erebia dabanensis chingiza* subsp. nov., *Erebia kefersteini amica* subsp. nov., *Erebia erinny chara* subsp. nov., *Oeneis norna radnaevi* subsp. nov., *Boloria alaskensis bato* subsp. nov., *Clossiana erda puella* subsp. nov. и *Boloria purpurea* spec. nov. описаны с Баргузинского и Кодарского хребтов. На основании исследования гениталий подтвержден видовой статус *Erebia erinny* WARREN, 1932. Обсуждается статус таксона *Erebia troubridgei* DUBATOLOV, 1992.

### Introduction

In the course of his work to investigate the Rhopalocera of Transbaikalia, the author and a group of enthusiasts and professional entomologists have undertaken a number of collecting trips to the Barguzin and Kodar Mts.

Expeditions worked in the Barguzin Mts. in June-July 1992, 1994 and 1996 with more successful result in the western edge of the range at the upper stream of the Nesterikha River. The Barguzin Mts. are situated between the Lake Baikal and the Barguzin River at a distance of 250 km to the NE from Ulan-Ude. Between this range and the Khamar-Daban Mts. the low Ulan-Burgasy Mts. are situated, which have no real developed tundra zone.

The Kodar range was visited in July 1996 and 1997. It is situated at a distance of 550 km from the Nesterikha River to the NE and to the north from the Chara River (Lena River system). The nature here is similar to the well-known Suntar-Khayata Mts., although the distance between these two localities is about 1200 km to the NE.

So far no real study has been published about the Rhopalocera of these regions.

Mainly the type material will be deposited in the Zoological Museum of the Moscow State University and in the author's private collection. Some paratypes will be deposited in the private collections of V. TUZOV, V. PLETNEV, and D. ZAMOLODCHIKOV.

### Abbreviations

FW – forewing

HW – hindwing

*Erebia dabanensis chingiza* subspec. nov.

Type material

Holotype ♂: Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Paratypes: 25 ♂♂, 5 ♀♀, same data, S. CHURKIN & A. PETROV leg.; same data, 5 ♂♂, 1 ♀♀, J. RADNAEV leg.; 2 ♂♂, same locality, 1100 m, 6., 8.VII.1997, A. PETROV leg.; 2 ♂♂, 2 ♀♀, same locality, 19.–25.VII.1996, V. KOMAROV leg.; 3 ♂♂, 2 ♀♀, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1900–2000 m, 28.–30.VI.1996, S. CHURKIN leg.; 2 ♂♂, same data, V. Tuzov leg.; 3 ♂♂, 1 ♀, same locality, 6.–13.VII.1996, V. PLETNEV leg.; 2 ♂♂, 1 ♀, same data, J. RADNAEV leg.

Description

Male. Holotype (colour plate VIII, figs. 7, 7A): FW length 20.5 mm, paratypes from Barguzin 17–20 mm, from Kodar 17–21 mm, usually 19–20 mm.

FW upperside dark with typical pattern of the species. In addition to 4 submarginal reddish spots 75% specimens have a small spot above M1, often with a black dot. All spots are separated, two apical dots are a little bit enlarged and elliptical. Generally, the good series of paratypes shows the great variability of the typical pattern of *E. dabanensis*. Spots are sometimes yellowish, but never totally yellow. Apical dots often elliptical (not so much) but often rounded and never drop-shaped. These apical dots sometimes bigger than two others, but in many paratypes the third dot is the biggest (we numbered the spots except the first additional one from apical to anal angle). In two paratypes dots 3 and 4 are reduced and almost invisible (on the underside, too). One specimen has the reddish spots practically evolved to a band, separated by veins, not so wide and not extended to the basal part of the wing.

HW upperside with 3 (seldom 4) rounded reddish spots with black dots.

FW underside with a submarginal reddish band darkened by veins. This band usually is bordered by a thick black line and suffused by greyish scales on the apical side. Black dots developed as much as on the upperside. Around the dots a very thick yellowish ring sometimes is present, but the band is never totally yellow. Width of the band generally less than in the nominate subspecies; often the band is only a little bit wider than the dots and cut out by the veins – but never looks as a separated oval spot.

HW underside darker than in the nominate subspecies. Median band variable in width, as well as the basal and submarginal greyish bands. Median band practically without grey scales, with a few in the middle only. The other two bands also suffused less than in the nominate subspecies. Moreover, the basal band sometimes divided to several (2–4, usually 3) grey spots; in two paratypes the basal band is practically absent. Submarginal band with black dots.

Genitalia (fig. 1) with all specific characteristics (WARREN, 1936: 244–245). Interesting to note, that the shape of the valva is not so variable as in the nominate subspecies. The “foot” is well developed, the proportion of the width of the spined ridge to the total length of the dorsal side of the valva is 58–60% (av. 50–63%). The spined ridge consists of 2 full and 1–2 not-full rows of spines. All aberrative specimens (see above) have genitalia very similar to the usual form.

Female (colour plate VIII, figs. 8, 8A): length of the FW 17–21 mm, usually 19–20 mm. Generally lighter than the male. The groundcolour of the upperside of the wings is the same on the whole surface not changed at the marginal part. HW underside is contrasting and similar to the nominate subspecies.

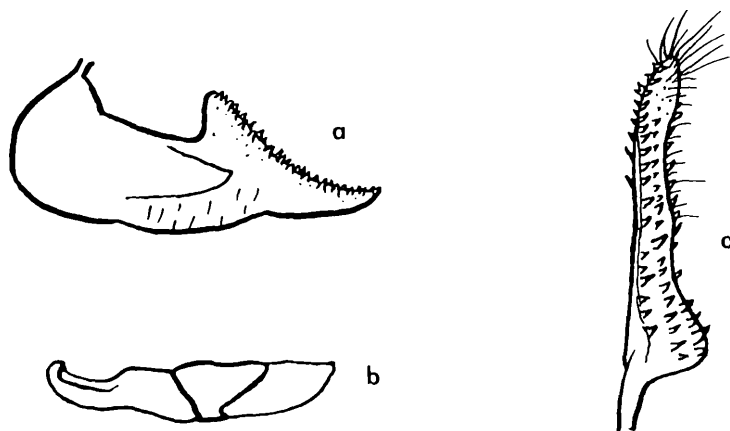


Fig. 1: Male genitalia of *E. dabanensis chingiza* subsp. nov., paratype (Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.): a – valva, inside lateral view; b – aedeagus; c – spined ridge, dorsal view.

#### Diagnosis and taxonomy notes

Three subspecies were described from Russia: *dabanensis* ERSHOFF, 1871 from the Khamar-Daban and Sayan Mts., *olschvangi* GORBUNOV, 1995 from the Polar Ural and *troubidgei* DUBATOLOV, 1992 from Yakutia.

We studied two series of *E. d. olschvangi* from different parts of the Polar Ural. This subspecies is distinguished by very poorly developed reddish spots and reduced black dots. The submarginal band on the HW underside is often (not always!) divided into separated spots as in *E. kozhantshikovi* SHELJUZHKO, 1925, but the spots are angled, not oval. Genitalia quite specific for *E. dabanensis* with less spines and less proportion spined/total length of the valva. In some characteristics this subspecies is similar to the coastal subspecies of *E. youngi* HOLLAND (like subspecies *herscheli* LEUSSLER) but the proportion of the valva is 54%, average 47–57%. *E. youngi* has a very short spined ridge 43%, average 36–47% (TROUBRIDGE & PHILIP, 1982: 115). In spite of the correlation in the extreme case of 47%, we consider that these data confirm the division of the species: *E. d. olschvangi* has an elongated tip of the valva, distinct from the shortened tip of *E. youngi*. As a result this should be the main distinguishing characteristic. The new subspecies is distinct from *E. d. dabanensis* by its smaller size (usually 18–20 mm, up to 20–22 mm), a less developed grey suffusion of the median band on the HW underside and by an additional small spot with black dot which is often presented on the apical part of the FW upperside. *E. d. dabanensis* as a rule without this last spot. The female differs by a distinctively lighter groundcolour at the marginal part of the HW upperside which is visible in the nominate subspecies and absent in a the new one.

The spined ridge of the valva of *E. d. dabanensis* usually consists of two row of spines as shown by BELIK (1996: 24). Unfortunately he concluded that this is a invariable characteristic. Actually *E. d. dabanensis* sometimes has several spines more situated between the two usual

rows on the distal end of the spined ridge; several spines are sometimes presented at the tip of the spined ridge.

*E. d. chingiza* subsp. nov. always has 1 or 2 good visible additional rows of spines, one is practically full (fig. 1c). From the lateral view this seems as if the density of the spines in *E. d. chingiza* is higher than in the nominate subspecies.

The status of *E. d. troubridgei* is not clear. It is to be noted, that the description is absolutely bad and has no photos or figures. The results of the genitalia dissection are also absent. This taxon was compared with the nominate subspecies and the author did not mention *E. kozhantshikovi*. DUBATOLOV refers to *E. d. dabanensis* as a butterfly with a whole reddish band on the FW upperside. This is absolutely not true (the size of the butterflies is also mistaken). According to DUBATOLOV, *E. d. troubridgei* is distinguished by separated spots which do not evolve into a band, but this is a specific characteristic of the species. As a result, no one real distinction was observed.

It is to be noted also that the specimens from Chukotka determined later as a *E. troubridgei* DUBATOLOV, bona species in Tuzov (1997: plate 49, figs. 16–18) are practically identical with the specimens of *E. kozhantshikovi* their photos nearby at the same plate (plate 49, figs. 19–20). We dissected the specimens shown on the photos as *E. troubridgei* and as *E. kozhantshikovi* – they are identical and typical for the last.

The type material of *E. troubridgei* was mainly collected in June at the road Khandyga-Magadan (mostly at km 232, where this butterfly is one of most common according to the description) in the thin larch forest. Usually this time period and forest are native specially for *E. kozhantshikovi* (we collected here especially the last species). *E. d. dabanensis* is a mountain stone tundra butterfly flying mainly in July. But we have some records that in the Magadan region *E. troubridgei* was collected also in larch forest (own material and data of an american collectors).

We studied the photos of the one paratype – it is a true *E. dabanensis*. Tuzov examined the main series of the paratypes – mostly also belonging to this species. Without investigation of the holotype it is impossible to make a definite judgment (according to our information the holotype is lost). Summing up we can conclude that *E. d. troubridgei* is very close to the nominate subspecies – much more than the new one. Practically all external differences between the subspecies we marked before are present in this case – beginning from the distinct smaller size. In our opinion, *E. d. troubridgei* flies not only in Yakutia, but at least in the Magadan-Bilibino region. This subspecies lives mostly in another biotop, not so high and cold as *E. d. chingisa* and has some distinction going to the nominative as a return.

Besides, we can say that in practice it is not difficult to separate *E. dabanensis* from *E. kozhantshikovi*, if one has a series of the butterflies.

*E. kozhantshikovi* usually has a yellowish colour of the spots on the FW, the apical dots are always elliptical, larger than the others and often drop-shaped; they look as if they are somewhat separated from the other dots. In *E. dabanensis* the apical dots are reddish, usually not rounded, never drop-shaped and all dots look like a united system, the third dot being often the biggest one and this is easy to find in series.

The pattern on the FW underside of *E. kozhantshikovi* is the same as on the upperside: separated small spots with the dots. The pattern in *E. dabanensis* is different in upper- and undersides: it appears as if the underside pattern of *kozantshikovi* was put inside the reddish space of a united band. In practice it is not so easy to use this difference in the contrasting of the HW underside. The distinctions in genitalia are well presented by TROUBRIDGE & PHILIP (1982).

## Biology

*E. d. chingiza* subsp. nov. was found in the stone mountain tundra since the end of June, sometimes together with *E. rossi* or *B. eugenia*. Interesting to note, that the small places where *E. d. chingiza* was abundant we have not observed many specimens of all the other species.

## Etymology

The name of the new subspecies was made in a way to resemble the name of the famous Chingiz-khan, whose family allegedly originated from the Barguzin Valley.

### *Erebia kefersteini amica* subsp. nov.

## Type material

Holotype ♂: Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1600 m, 13.VII.1994, S. CHURKIN leg.

Paratypes: 3 ♂♂, 2 ♀♀, same data, S. CHURKIN leg.

## Description

Male. Holotype (colour plate VIII, figs. 9, 9A): FW length 17 mm, paratypes 17–18 mm.

FW upperside similar to the nominate subspecies, but the reddish-brown suffusion is much more developed. The submarginal band is yellowish, but also with dense reddish suffusion and not contrasted with the groundcolour. This band with usual 4 black dots (one paratype has a not clearly visible fourth dot). On the upperside edge of the band all specimens have an additional very small but distinctive black dot at the margin of the reddish spot.

HW upperside dark with a row of 4 submarginal reddish spots with black dots (only one paratype without one dot).

FW underside as in the nominate subspecies, submarginal band more yellowish and contrasting as on upperside.

HW underside with the pattern of the species, several spots with black dots developed.

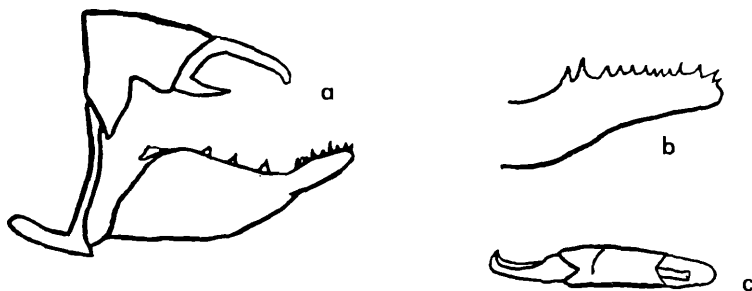


Fig. 2: Male genitalia of *E. kefersteini amica* subsp. nov., paratype (Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1600 m, 13.VII.1994, S. CHURKIN leg.): a – lateral view; b – tip of the valva; c – aedeagus.

Genitalia (fig. 2) similar to the nominate subspecies. It is to be noted that the number of spines on the dorsal surface of the valva is less (3-4 vs. 3-10 in *E. k. kefersteini*) and the distal end of the aedeagus is less sklerotized.

Female (colour plate VIII, figs. 10, 10A). FW length 17-18 mm. Similar to the male, but underside of HW not so contrasted and the black dots on the upperside are better developed.

#### Diagnosis

Until now the eastern limit of the areal of *E. kefersteini* (EVERSMANN, 1881) was the Selenga River (Khamar-Daban Mts.) (BOGDANOV et al., 1997: 203). The type locality of the new subspecies is situated in another mountain system which lies to the east of the former areal.

The new subspecies is little similar to f. *effusa* GOLTZ, 1930 described from Altai. This form has together a with dense reddish suffusion "a loss of many of the black spots and looks like *E. kindermanni* STAUDINGER" (WARREN, 1936: 121). The new subspecies differs from all known forms of the nominate subspecies (and, of course, from *E. k. khalsunica* LUKHTANOV, 1990, which misses practically all dots) by a combination of the not contrasting suffused submarginal band on the FW and a full number of black dots, including the additional above M1. Usually *E. k. kefersteini* has only 2 dots and has no additional dot while the submarginal band is distinctive yellow without a dense reddish suffusion.

#### Biology

*E. k. amica* subsp. nov. was found flying among the high grass at the border of the mountain forest together with *Clossiana angarensis*, *Cupido minimus*, *Erebia ligea* and others species. The density of the population was very low.

#### Etymology

The name of new subspecies can be translated from the Latin language as "friend", feminine.

#### *Erebia erinnyn chara* subsp. nov.

#### Type material

Holotype ♂: Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600-1900 m, 10.-17.VII.1997, S. CHURKIN leg.

Paratypes: 23 ♂♂, 13 ♀♀, same data, S. CHURKIN and A. PETROV leg.

#### Description

Male. Holotype (colour plate VIII, figs. 1, 1A): FW length 25 mm, paratypes 22-26 mm.

FW upperside black with a large triangle red area, which consists of 5 parts. Four parts form a submarginal band obscured by veins. The last part extends from this band to the basal part of the wing being more or less darkened near the cell. The red area is present in all paratypes and appears distinctly as a whole even if it is densely darkened.

HW upperside black, but about 50% of the paratypes have a slight red suffusion on the outside of the cell.

FW underside dark with a reddish area from the basal to the marginal side. HW underside dark with a submarginal band indistinguished lighter than the groundcolour and with irregular light greyish accumulations of scales. Outside the cell between veins M1 and M2 the light

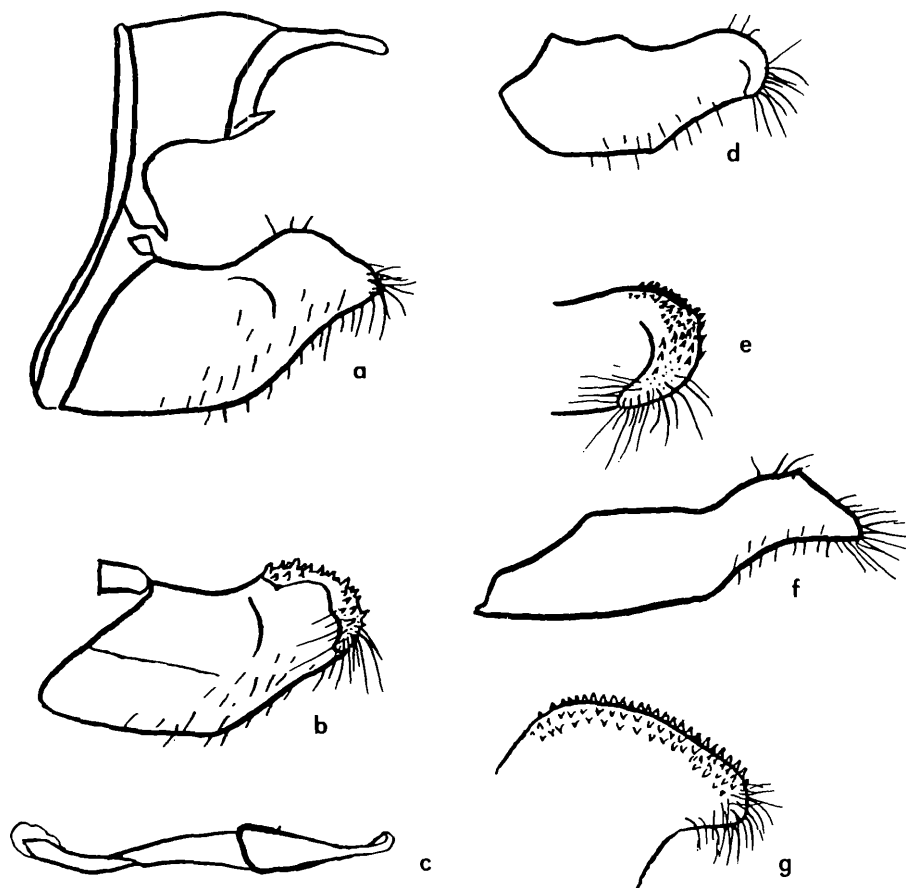


Fig. 3: Male genitalia of *E. erinnyn chara* subspec. nov., paratype (a, b, c), *E. erinnyn erinnyn* (d, e) and *E. sachensis* (f, g): a – lateral view (spines not figured); b, d – valva, inside lateral view; c – aedeagus; e, g – head of the valva, inside view (g – with blow up); f – valva, lateral view (spines not figured). (*E. e. erinnyn* – Buryatia, Tunkinskie Goltsy Mts., Mondy, 2500 m, 17.VI.1994, A. BELIK leg.; *E. sachensis* – E. Yakutia, Suntar-Khayata Mts., upper stream of E. Khandyga r., Kiurbiliakh r., 17.VI.1990, S. CHURKIN leg.; *E. e. chara* – Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.).

greyish oval spot is present. This spot is sometimes very small but always visible in fresh specimens.

Genitalia (figs. 3a–c). Shape of the valva similar to the nominate subspecies. Valva short and thick, proportion (fig. 3a) of the total length of the ventral side of the valva to the width of the

valva 2:1 (not more than 2.5:1). Valva with a small extended process usually less spined and curved to the space between the valves (fig. 3b). Length of this process variable and sometimes very small, in that case the head of the valva almost is rounded. The branches of the gnathos are unusually small, twice less than in all the other taxa of the *magdalena*-group, and 5–6 times shorter than the uncus. Aedeagus with a narrow, thin, less sclerotized distal part (fig. 3c).

Female (colour plate VIII, figs. 3, 3A). FW length is 22–26 mm. Groundcolour of upperside similar to the male but paler. Darkened suffusion on the red area not so extensive as in the male but developed. Red suffusion on the upperside of the HW is more visible but present also in 50% of the paratypes. Underside HW with more light-grey suffusion and as a result the white spot near the cell not so contrasting.

#### Diagnosis and taxonomical notes

The following taxa included in the *magdalena*-complex were described from Russia: *E. erinnyn* WARREN, 1936 from Sayan, *E. sachaensis* DUBATOLOV, 1992 from Yakutia and *ola* KORSHUNOV, 1995 from the Magadan region. The status of all taxa is not clear and in the latest work these taxa were treated as subspecies of *E. magdalena* STRECKER, 1880 (BOGDANOV et al., 1997: 209). However, KORSHUNOV considered that all three taxa are good species (1996: 35). He based this opinion on the distinctions of genitalia and androconial scales but without any real comments and diagnosis. When we prepared genitalia of *sachaensis* (topotypus) and *erinnyn* we discovered that the figs published in KORSHUNOV's work (1996: 57, fig. 6) are not correct. Different figures were taken from different views and in different styles (probably, by different persons). Some figures do not reflect the real volume structure and proportions are wrong (size of hairs also, for example). An observer is unable to judge on the real variability and differences between the taxa. As a result the conclusion of KORSHUNOV was rejected later (BOGDANOV et al., 1997: 209).

The actual distinction between *E. erinnyn* and *E. sachaensis* is very great and easy to find. The valva of *E. erinnyn* is short and thick (fig. 3d), the proportion (see above) of length to width is usually 2: 1 (not more than 2.5: 1). Valva have a real neck. There is a small process present at the tip of the valva curving into the inner space between the valves (fig. 3e). From lateral view this process is not visible and the valva's head is rounded. Sometimes this process is little developed but never the view as in the next taxon.

The valva of *E. sachaensis* is much longer and narrow (fig. 3f). The proportion is 3.5: 1 (or more). A neck is not distinct. The tip of the spined part of the valva is well elongated and without real curvature into the inner space. From lateral view it shows another shape of the valva (fig. 3g) with flattened head.

In *E. sachaensis* the distal part of the aedeagus is strong, well sclerotized with a developed lump at the end. In *E. erinnyn* the distal part is not so sclerotized, narrow and without a lump at the end.

It must be noted, that the important rule of the total proportion of the genitalia in this group of species was specified by WARREN when he disputed with CHAPMAN over *E. magdalena* and *E. fasciata* BUTLER, 1868 (WARREN, 1936: 176). At a first glance, the genitalia of these taxa are very similar, but in fact they are very different based on the total proportion of their structure. We consider that such a mistake has determined the position of *E. sachaensis* (*magdalena*-complex) close to *E. fasciata* as it's done once again in KORSHUNOV's paper.

We have examined the androconial scales also (the types of scales are given in WARREN's monograph, p. 15–21). Despite KORSHUNOV's notes (1996) there are no real androconial scales in *E. erinny*. We discovered only a primitive type of such scales. This conclusion is in accordance (!) with the figures of the scales published in the KORSHUNOV's work (1996: fig. 5).

*E. sachensis* has real androconial scales as well as primitive ones. Hairs are also present (in a lesser quantity than in *E. erinny*) in spite of the wrong opinion of KORSHUNOV, as he did not find hairs when trying to bring this taxon closer to *fasciata*.

All these data confirm that *E. erinny* is a good and very primitive species. We think that *E. erinny* and *E. sachensis* are sibling-species. Different types of androconial scales and construction of the valva must strictly separate the first species from the second one in nature—but the appearance of these butterflies is very similar.

The relationship between american taxa and *E. sachensis* falls beyond the frame of the present article. *E. ola* probably belongs to *E. sachensis* as a butterfly with real androconial scales. The new taxon has all characteristics essential for *E. erinny*. From this (and from all taxa which are included into the *magdalena*-complex) *E. erinny chara* subsp. nov. is distinguished by its very short and small branches of the gnathos in the male genitalia and the well developed red area on the wings of all specimens, this area extending to the basal part. The red suffusion on the HW upperside is also remarkable. Males of *E. e. erinny* and *E. sachensis* are mostly black or with the red spots only in the submarginal part of the forewings, HW upperside is totally dark, the branches of the gnathos in both species are twice as long.

### Biology

The butterflies was found at the rocks fall in the mountain valley.

### Etymology

The name of this subspecies was inspired by both Chara River and the russian word "chary" which means "charms"

## *Oeneis norna radnaevi* subsp. nov.

### Type material

Holotype ♂: Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoye Lake, 1800 m, 26.VI.1995, J. RADNAEV leg.

Paratypes: 5 ♂♂, same data, J. RADNAEV leg.; 2 ♂♂, same data, A. PHILIPPOV leg.; 5 ♂♂, same locality, 1500–1800 m, 29.–30.VI.1996, S. CHURKIN leg.; 2 ♂♂, 2 ♀♀, same locality, 1200–1400 m, 20.–25.VI.1996, S. CHURKIN leg.; 5 ♂♂, 6 ♀♀, same data, V. Tuzov leg., 1 ♀, same locality, 1800 m, 10.VII.1996, J. RADNAEV leg.

### Description

Male. Holotype (colour plate VIII, figs. 4, 4A) FW length 26 mm, paratypes 24–28 mm.

FW upperside dark-brown with a reddish submarginal band obscured by the veins. One black spot between M1 and M2 is present, often elliptical. Three paratypes have an extra small black spot between Cu1 and Cu2. Sometimes the band is reduced and looks like a complex of very small dark-reddish separated spots (colour plate VIII, figs. 5, 5A). Androconial spot as in *O. norna altaica* ELWES, 1899 straight and dark around the basal part of the Cu-veins.

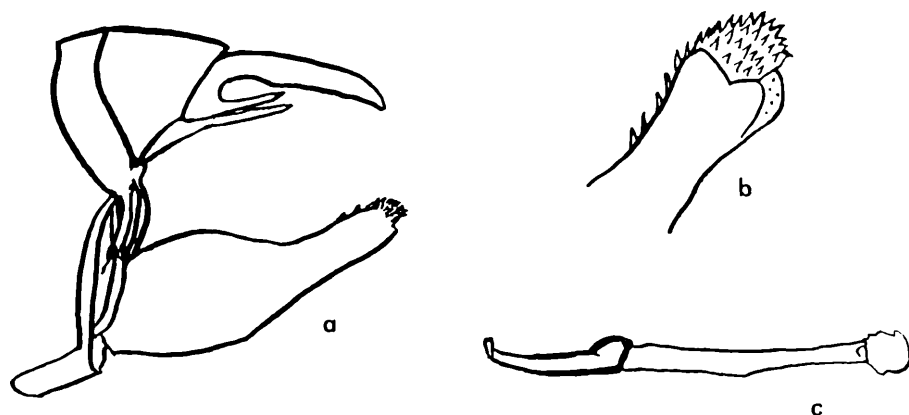


Fig. 4: Male genitalia of *O. norna radnaevi* subsp. nov., paratype (Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1500-1800 m, 29.-30.VI.1996, S. CHURKIN leg.): a lateral view; b tip of valva; c aedeagus.

HW upperside dark-brown with a reddish submarginal space. Several light (whitish) dots are at the outward side of this space and in some specimens one black spot.

Underside typical for the species but not so contrasting and not so light.

Genitalia (fig. 4) similar to *O. n. altaica*, but the uncus is narrower from the lateral view, not so strong, and in total the genitalia is smaller and weaker.

Female (colour plate VIII, figs. 6, 6A). FW length 26-28 mm, one specimen 23 mm.

Upperside FW with 2-3 black spots, submarginal band yellowish. One female with lighter basal part of the wing, like the females from northern Far East. Underside is as in the male, except for the number of spots.

#### Diagnosis

The new subspecies is very different from all known subspecies of *O. norna* THUNBERG, 1791 by its reddish colour of the band on the FW and generally the strongly darkened upperside. *O. n. altaica* from Altai has the same size (or something larger) but a very light and clear ochre on the upperside while the number of spots is 2 or more (LUKHTANOV, 1989: 31-34). *O. norna* from Yakutia is distinctive smaller, also ochre coloured and has many other differences (see in LUKHTANOV's review of the *norna*-group).

#### Biology

Shrubby mountain tundra and border of the mountain forest. The butterflies were found at different altitudes, but the density of the population was low everywhere.

#### Etymology

This subspecies is named after Mr. Jargal E. RADNAEV, a professional biologist and good friend, whose help had made possible all our expeditions.

*Boloria alaskensis* **bato** *subspec. nov.*

Type material

Holotype ♂: Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Paratypes: 2 ♂♂, same data, S. CHURKIN; 3 ♂♂, 1 ♀, same data, A. PETROV leg.; 7 ♂♂, 2 ♀♀, Russia, Chita reg., Kodar Mts., near Bolshoe Leprindo Lake, 1900–2000 m, 19.–25.VII.1996, V. KOMAROV & A. BRENEV leg.

Description

Male. Holotype (colour plate IX, figs. 4, 4A): FW length 19 mm, paratypes 18–20 mm, usually 18–19 mm.

Antenna mostly yellowish; club not totally but mostly yellow, proportion of length to width in the middle segments is 3:1.

FW upperside is yellowish-orange and of typical pattern. This pattern is well developed as a rule, only 2 paratypes have reduced thin spots. The basal part is darkened including the first dark spot in the cell. Besides the cell has two dots (as a rule, seldom one dot or two joined dots), a vertical streak and a last one on the cell's border. The discal row of the spots looks like being permanent. Spots between Cu1–Cu2 are distinctively separated from the cell and the corner of Cu1. The postdiscal row consists of 6 spots, the upper three spots are separated from the other three. Marginal streaks usually not extended toward submarginal line, if so they are little extended, the triangles are not contrasting in shape and not sharp.

HW upperside is typical, the marginal streak is similar to the FW in shape, a little bit more triangular between Cu1–Cu2 and M3–Cu1.

FW underside mostly not contrasting, yellowish with only a small number of dots appearing from the upperside. The fringe is more or less contrasting but the darkened parts are always darker than the small suffusion spots on the wing bordered with the fringe.

HW underside is contrasting. The light median band yellowish, the submarginal part brown-reddish. Basal part on the outer side is arch-shaped but not so nice and perfect as in *B. a. sedykhi* DE CORMIER, 1977. The under angle of the inner border of the first light spot is moved to the corner of the R-vein (this characteristic is variable in length but always visible). The inner margin of the pearl spot in the cell touches the corner of Cu2. The light spot between Cu1 and Cu2 is not moved towards the basal part of the wing. The same spot between Cu2 and 2A is well developed. The distinctive black dot is developed inside the yellow spot on the marginal space.

Genitalia (fig. 5b) typical for the species, head of the harpe very long, usually more or less curved. We are preparing now a review of Sibirian *Boloria*, where genitalia distinction (including also *B. purpurea* spec. nov.) will be examined in details.

Female (colour plate IX, figs. 6, 6A). FW length 19–22 mm. Alike the male but paler and very obscured. Shape of the wings visibly angled. Reddish colour at submarginal part of the HW upperside well developed. Underside more contrasting than in the male.

Diagnosis

All characteristics of the new subspecies are specific to *B. alaskensis* HOLLAND, 1900 (du CORMIER, 1977: 37–43), as distinguished from the other sibirian species *B. napaea altaica* GRUM-GRSHIMAILO, 1893, *B. frigidalis* WARREN, 1944 and *B. banghaasi* SEITZ, 1909. There are

three subspecies of *B. alaskensis* noted in Russia: *sedykhi* DU CORMIER, 1977 from the Polar Ural, *nearctica* VERITY, 1932 from Chukotka and *nikolajewski* HEYDEMANN, 1920 (WARREN, 1944: 49- 50) from Yakutia. We compared good series from the Polar Ural, Taymyr, Putorana plateau, and Chukotka.

The status of *B. (napaea) vinokurovi* DUBATOLOV, 1992 is not clear. The description without any figures or photos is very bad and contains all characteristics of *B. alaskensis*, except for the united postdiscal band of the spots and the straight harpe. It is impossible to see the first distinction examining only one male as DUBATOLOV did. Another distinction is variable and sometimes presented in *B. alaskensis*, too. Moreover, we studied the photos of the holotype and concerned that the postdiscal row is not straight (!). We determined this specimen as *B. alaskensis*. So, if *B. vinokurovi* might be included in *B. alaskensis* this is a synonym of *B. a. nikolajewski*.

The new subspecies was collected very far from the known areal of the species. This is a first occasion when this species was found outside the Polar Circle at such a big distance. The differences from *B. a. sedykhi* are as follows: the male is paler but the underside of the wings is much more contrasting and darker reddish; the two spots in the cell are mostly separated (in *B. a. sedykhi* mostly joined), underside also without so many greenish hairs, especially in the female. The female of *B. a. sedykhi* is essentially brighter, sometimes with not extensive dark suffusion on the FW upperside; HW underside with a reduced reddish suffusion so that the underside is bright and not so contrasting.

*B. a. nikolajewski* has reduced dots in the cell, all black pattern on the upperside more reduced and the light spots on the discal band on the HW underside less developed.

*B. a. bato* always has a black dot in the yellow spot on the marginal space on the HW underside, while all other subspecies have this dot only virtually. More important, the arch-shape of the basal band on the underside HW is not so regular.

### Biology

The butterflies were found in the warmer grassy tundra but not at the bog. The density was low and females emerged only when females of *E. e. chara* and *E. d. chingiza* still flying were damaged.

### Etymology

The name of this subspecies is related to a member of our expeditions, Mr. BATOZHAB RADNAEV, whose help was sometimes especially necessary.

### *Boloria purpurea spec. nov.*

#### Type material

Holotype ♂: Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1900–2000 m, 6.–13.VII. 1996, V. PLETNEV leg.

Paratypes: 31 ♂♂, 3 ♀♀, same data, V. PLETNEV, J. RADNAEV & B. RADNAEV leg.

#### Description

Male. Holotype (colour plate IX, figs. 1, 1A): FW length 19.5 mm, paratypes 17–20 mm, usually 18–19 mm.

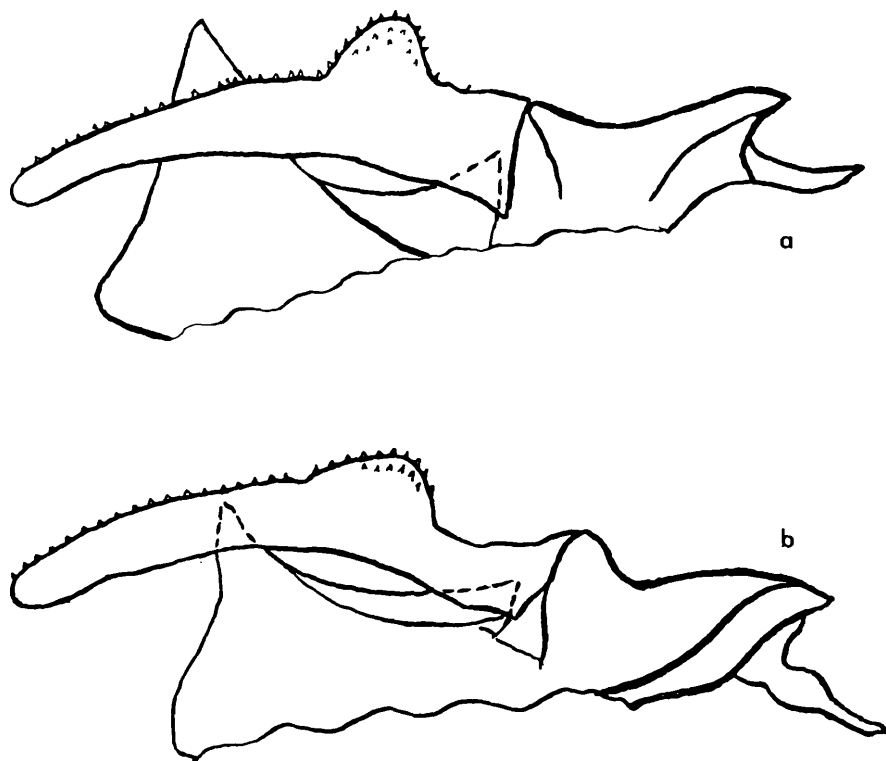


Fig. 5: Harpe and valva (part) of: a – *B. purpurea* spec. nov., paratype (Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoye Lake, 1900–2000 m, 6.–13.VII.1996, V. PLETNEV leg.); b – *B. a. bato* subsp. nov., paratype (Russia, Chita reg., Kodar Mts., near Sul’ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.).

Antenna and club mostly black; the proportion of length to width in the middle segments is 2:1.

FW upperside is intensively orange-red, very rarely yellowish with the typical pattern of this group: the black spots intensive and well developed. The basal part is darkened except for the first black spot in the cell. Then the cell has no dots (as a rule, sometimes one small is present, and very rare two joined dots), than the vertical spot and the last one on the cell’s border.

The discal row of the spots looks to be permanent. The location of the spot between Cu1–Cu2 is very unusual: all variations from separated to joined with the cell and corner of Cu1 are present. It is impossible to say what option is typical. There are many specimens with more or less separated location, but there is another location proving that the option itself is not so important in this species.

The postdiscal row consists of 6 spots, they appear as one line. Marginal streaks usually extended toward the submarginal line; some streaks always with a good visible triangular shape. HW upperside typical, actually all marginal streaks always with a contrasting triangular sharpened shape. The postdiscal row is very well developed, larger than others.

FW underside not contrasting, reddish, mostly without black dots. Fringe usually with no contrasting darkened part, not darker than marginal suffusion spots on the wing bordered with the fringe. But sometimes the fringe with a very small dark part a little bit darker than the marginal spots.

HW underside is contrasted but not so much because it is covered by a reddish suffusion of scales. Sometimes the total colour is paler, sometimes darker. The basal part on the outward side is not arch-shaped. Under angle of the inner border of the first light spot touches the corner of the R-vein. The inner margin of the pearl spot in the cell is moved from the corner of Cu2. The light spot between Cu1 and Cu2 is moved to the basal part of the wing. The same spot between Cu2 and 2A is reduced but not so much and usually visible.

The yellow spot on the marginal space always without a black dot, only sometimes this dot slightly appears from the upperside.

Genitalia (fig. 5a) characterized by intermediate (between *B. alaskensis* and *B. n. altaica*) size of harpe and by a very big membranous area on the tegumen.

Female (colour plate IX, figs. 3, 3A). FW length 19–20 mm. Pattern similar to that of the male, but groundcolour unusually deep red-purple with dense suffusion of dark scales. Shape of the wings rounded. HW underside deeply contrasted with greenish tinge, the fringe is contrasting.

### Diagnosis

All characteristics are not like in *B. alaskensis* HOLLAND, 1900; the butterfly is quite different from those from the Kodar range (see above), but belonging to the *napaea*-complex, not to the *pales*-group (long head of harpe, dimorphic females).

*B. purpurea* similar to *B. napaea* HOFFMANSEGG, 1804 in some characteristics, if we consider some european subspecies. From *B. n. altaica* the new species is distinguished by actual smaller size, more contrasting underside with a reddish (not yellowish or greenish) suffusion. The appearance of the butterflies is also different with more angled wings. *B. frigidalis* has a darker underside, a contrasting fringe in the male, and a black dot in the yellow spot on the FW underside is often present.

Both *B. napaea* (including *altaica*) and *B. frigidalis* are distinct from the new species by the usual location of the spot between Cu1-Cu2, which is always clearly separated from the cell. By this characteristic *B. purpurea* is closer to the *pales*-group, as noted above. The female, the appearance of which is much important in this genus for identification, has a very unusual colour, absolutely different from the paler females of *B. n. altaica* and *B. frigidalis*.

### Biology

This butterfly was found on a grassy tundra bog with several shrubs at a time when *B. eugenia* and *E. callias* fly in another part of the tundra. The population was very local and living near the place where we collected *Oeneis pansa* – the endemic of Transbaikalia rediscovered in the course of this expedition.

### Etymology

The name of this species means "purple" *Boloria*.

*Clossiana erda puella* subspec. nov.

Type material

Holotype ♂: Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1900–2000 m, 28.–30.VI.1996, S. CHURKIN leg.

Paratypes: 43 ♂♂, 17 ♀♀, same data, S. CHURKIN leg.; 30 ♂♂, 10 ♀♀, same data, V. Tuzov leg., 13 ♂♂, 17 ♀♀, same locality, 6.–13.VII.1996, V. PLETNEV & J. RADNAEV leg.

Description and diagnosis

Male. Holotype (colour plate IX, figs. 7, 7A): FW length 22 mm, paratypes 19–24 mm, usually about 21 mm.

Two subspecies were described from the Sayan mountains system: *erda* CHRISTOPH from Yakutia and *kitoica* BELIK (1996: 163–164). The latter one (only 4 type specimens known) is similar to the nominate subspecies but paler according to the description, the female is very darkened with a darkened basal area of the hindwings. Some published distinction are not true (we think that BELIK did not possess a good series of *C. e. erda* for comparison), but this is a good subspecies, if we mention the geographical factor. We studied more than 50 specimens from Yakutia (three places) and many from Kodar Mts.

*C. e. puella* is quite small, easy visible smaller than the known subspecies (24–25 mm in the Sayan subspecies and 24–27 mm in the nominate one, usually 24 mm). Of course, the new subspecies has the usual pattern of the species but the groundcolour is deeper and in red generally. In the postdiscal row of the black spots the last one (Cu2-A) lies in the middle between the submarginal and discal spots. In *C. e. erda* this spot usually (not always) is strongly moved to the marginal spot.

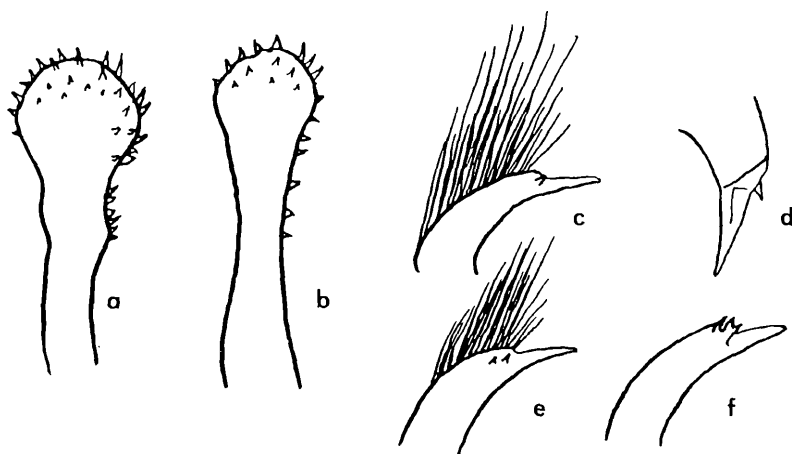


Fig. 6: Tips of the valva's processes: a, c, d – *C. erda erda* (E. Yakutia, Suntar-Khayata Mts., upper stream of E. Khandyga r., Kiurbiliakh r., 15.VI.1990, S. CHURKIN leg.); b, d, f – *C. erda puella* subspec. nov. (Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1900–2000 m, 28.–30.VI.1996, S. CHURKIN leg.).

HW upperside practically without lighter zone between the obscured discal row and the post-discal row. In both known subspecies this lighter zone is developed. The spot between R and M1 in the postdiscal row is well developed, in *C. e. erda* this spot usually looks like a small point, sometimes is even absent. Such a situation in the new subspecies is very uncommon. As it appears from the photos of all paratypes, *C. e. kitoica* is similar to the nominate subspecies by this characteristic.

The submarginal row of spots is not visible on the surface of the FW underside practically in all paratypes (in both known subspecies this row usually is visible).

The yellowish lighter spot on the submarginal space of the HW underside is not contrasted with groundcolour and obscured, as a rule. This distinction may be present in *C. e. kitoica*, too. The nominate subspecies has a contrasting lighter spot as a rule. In general, the whole underside surface of the new butterfly is darkened.

Genitalia similar to the nominate subspecies but the dorsal process of the valva is always rounded club-shaped and usually with a smaller number of spines on the neck (fig. 6b). Another process with 2–3 spines is close to the tip (fig. 6e). The latter spines are variable in size, sometimes very small and sometimes enlarged (fig. 6f). In the nominate subspecies the club on the dorsal process often (not always!) is symmetrical and not rounded and may look like a “foot”; there are more visible spines usually seated on the neck (fig. 6a); another process with one spine only (fig. 6c, d). 10 specimens of each subspecies are examined. These differences were not treated in the original description of *C. e. kitoica*.

Female (colour plate IX, figs. 9, 9A). FW length 20–25 mm, usually 21 mm, as in the male. FW length in the two other subspecies is the same: 24–25 mm (*B. e. erda* – up to 27 mm in our material) and more distinct than in male.

The female differs from the hitherto known subspecies more than the male: they are practically not darkened (obscured), mostly bright and contrasting. The postdiscal row of spots on the FW is practically straight – opposite to the row in *C. e. erda*, which is well divided in two lines, 3 spots in each as in the male.

The main obvious distinction is the shape of the forewings (both in male and female), they are elongated and angled in the apical part, not rounded as in the nominate subspecies. We have no definite opinion about *C. e. kitoica*.

The new subspecies was found in the area situated between the areals of the two known subspecies. When compared with *C. e. puella* both older subspecies show more characteristics which are similar, a cline of characteristics was not discovered.

In total, *C. e. puella* is a distinctive small form with not-rounded wings, bright females and with some distinction in male's genitalia, while *C. e. kitoica* has some characteristics of the nominate subspecies as a reversion. It is very important, that *C. erda* from Kodar Mts. (which we collected also) has no true differences from Yakutian butterflies and is distinctive from the new subspecies in all features.

## Biology

The butterflies inhabit the stony dry tundra. Flight was weak, sometimes the butterflies were found together with *Erebia rossi* and *Oeneis melissa*. The flight period was the last days of June and the first week of July.

## Etymology

The name may be translated from Latin as “small girl”

## Acknowledgments

We thank all our colleagues who worked with us in the expeditions or collected butterflies for us, namely JARGAL RADNAEV, BATOZHAB RADNAEV, VLADIMIR PLETNEV, ALEXANDER PETROV, VADIM KOMAROV, ALEXEI BRENEV, ALEXANDER PHILIPPOV.

Special thanks to VASILY TUZOV for his valuable participation in one of our expedition and also in the course of preparation and review of the manuscript.

ALEXEY DEVIATKIN and GENRIKH SAMODUROV were also very helpful as well as IGOR CHERNIAK who checked the English version of the present article.

All photos were taken by ANDREI SOTCHIVKO.

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Explanation of the colour plate VIII (p. 359):

Fig. 1: *E. erinny'n chara* subsp. nov., holotype ♂, Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Fig. 2: *E. erinny'n chara* subsp. nov., paratype ♂, same data.

Fig. 3: *E. erinny'n chara* subsp. nov., paratype ♀, same data.

Fig. 4: *O. norna radnaevi* subsp. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoye Lake, 1800 m, 26.VI.1995, J. RADNAEV leg.

Fig. 5: *O. norna radnaevi* subsp. nov., paratype ♂, same locality, 1500–1800 m, 29.–30.VI.1996, S. CHURKIN leg.

Fig. 6: *O. norna radnaevi* subsp. nov., paratype ♀, same locality, 1200–1400 m, 20.–25.VI.1996, S. CHURKIN leg.

Fig. 7: *E. dabanensis chingiza* subsp. nov., holotype ♂, Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Fig. 8: *E. dabanensis chingiza* subsp. nov., paratype ♀, same data

Fig. 9: *E. kefersteini amica* subsp. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoye Lake, 1600 m, 13.VII.1994, S. CHURKIN leg.

Fig. 10: *E. kefersteini amica* subsp. nov., paratype ♀, same data.

Figs. 1A–10A: same as figs. 1–10, undersides.

Explanation of colour plate IX (p. 361):

Fig. 1: *B. purpurea* spec. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoye Lake, 1900–2000 m, 6.–13.VII.1996, V. PLETNEV leg.

Fig. 2: *B. purpurea* spec. nov., paratype ♂, same data.

Fig. 3: *B. purpurea* spec. nov., paratype ♀, same data.

Fig. 4: *B. alaskensis bato* subsp. nov., holotype ♂, Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Fig. 5: *B. alaskensis bato* subsp. nov., paratype ♂, same locality, 19.–25.VII.1996, 1900–2000 m, V. KOMAROV leg.

Fig. 6: *B. alaskensis bato* subsp. nov., paratype ♀, same data as holotype.

Fig. 7: *C. erda puella* subsp. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoye Lake, 1900–2000 m, 28.–30.VI.1996, S. CHURKIN leg.

Fig. 8: *C. erda puella* subsp. nov., paratype ♂, same data.

Fig. 9: *C. erda puella* subsp. nov., paratype ♀, same data.

Figs. 1A–9A: same as figs. 1–9, undersides.

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| 1  | 4  | 7   |
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| 3  | 6  | 10  |
| 1A | 4A | 7A  |
| 2A | 5A | 8A  |
|    |    | 9A  |
| 3A | 6A | 10A |

Colour plate VIII

|    |    |    |
|----|----|----|
| 1  | 4  | 7  |
| 2  | 5  | 8  |
| 3  | 6  | 9  |
| 1A | 4A | 7A |
| 2A | 5A | 8A |
| 3A | 6A | 9A |

Colour plate IX

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# Colour plate VIII

CHURKIN, S. V.: New taxa of butterflies from Transbaikalia, Russia (Rhopalocera: Satyridae, Nymphalidae). – *Atalanta* **29** (1/4): 107–124.

Fig. 1: *E. erinnyn chara* subspec. nov., holotype ♂, Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Fig. 2: *E. erinnyn chara* subspec. nov., paratype ♂, same data.

Fig. 3: *E. erinnyn chara* subspec. nov., paratype ♀, same data.

Fig. 4: *O. norna radnaevi* subspec. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1800 m, 26.VI.1995, J. RADNAEV leg.

Fig. 5: *O. norna radnaevi* subspec. nov., paratype ♂, same locality, 1500–1800 m, 29.–30.VI.1996, S. CHURKIN leg.

Fig. 6: *O. norna radnaevi* subspec. nov., paratype ♀, same locality, 1200–1400 m, 20.–25.VI.1996, S. CHURKIN leg.

Fig. 7: *E. dabanensis chingiza* subspec. nov., holotype ♂, Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Fig. 8: *E. dabanensis chingiza* subspec. nov., paratype ♀, same data

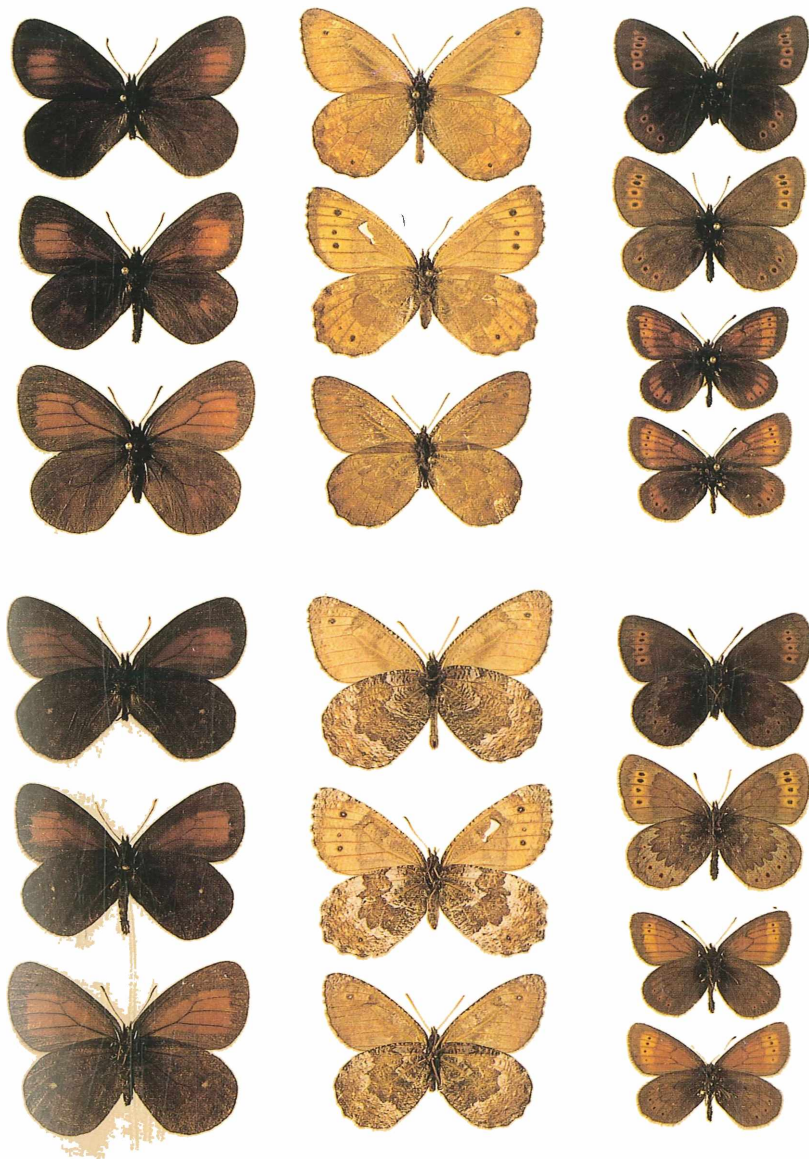
Fig. 9: *E. kefersteini amica* subspec. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1600 m, 13.VII.1994, S. CHURKIN leg.

Fig. 10: *E. kefersteini amica* subspec. nov., paratype ♀, same data.

Figs. 1A–10A: same as figs. 1–10, undersides.

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|----|----|-----|
| 1  | 4  | 7   |
| 2  | 5  | 8   |
|    |    | 9   |
| 3  | 6  | 10  |
| 1A | 4A | 7A  |
|    |    | 8A  |
| 2A | 5A | 9A  |
|    |    | 10A |
| 3A | 6A |     |

### Colour plate VIII



# Colour plate IX

CHURKIN, S. V.: New taxa of butterflies from Transbaikalia, Russia (Rhopalocera: Satyridae, Nymphalidae). – *Atalanta* 29 (1/4): 107–124.

Fig. 1: *B. purpurea* spec. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1900–2000 m, 6.–13.VII.1996, V. PLETNEV leg.

Fig. 2: *B. purpurea* spec. nov., paratype ♂, same data.

Fig. 3: *B. purpurea* spec. nov., paratype ♀, same data.

Fig. 4: *B. alaskensis bato* subsp. nov., holotype ♂, Russia, Chita reg., Kodar Mts., near Sul'ban River, 1600–1900 m, 10.–17.VII.1997, S. CHURKIN leg.

Fig. 5: *B. alaskensis bato* subsp. nov., paratype ♂, same locality, 19.–25.VII.1996, 1900–2000 m, V. KOMAROV leg.

Fig. 6: *B. alaskensis bato* subsp. nov., paratype ♀, same data as holotype.

Fig. 7: *C. erda puella* subsp. nov., holotype ♂, Russia, Buryatia, Barguzin Mts., Nesterikha River, Kedrovoe Lake, 1900–2000 m, 28.–30.VI.1996, S. CHURKIN leg.

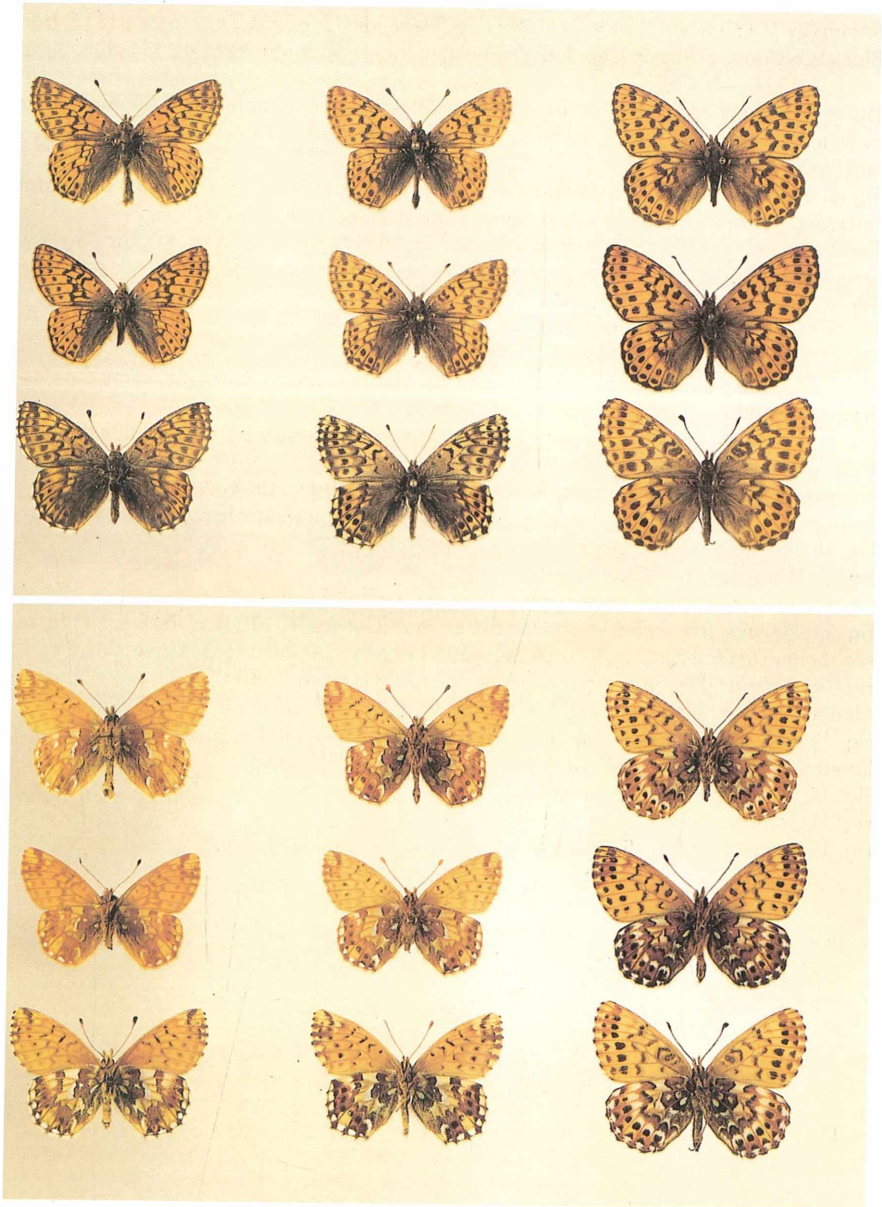
Fig. 8: *C. erda puella* subsp. nov., paratype ♂, same data.

Fig. 9: *C. erda puella* subsp. nov., paratype ♀, same data.

Figs. 1A–9A: same as figs. 1–9, undersides.

|    |    |    |
|----|----|----|
| 1  | 4  | 7  |
| 2  | 5  | 8  |
| 3  | 6  | 9  |
| 1A | 4A | 7A |
| 2A | 5A | 8A |
| 3A | 6A | 9A |

Colour plate IX



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