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Articles

Short review of Siberian Parnassius apollo Linnaeus, 1758 with the description of the new subspecies and designation of the neotype of P. a. sibiricus (Nordmann, 1851) (Lepidoptera, Papilionidae)

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The paper presents a short review of *Parnassius apollo* Linnaeus, 1758 from East Siberia and Mongolia. One new subspecies is described: *P. a. yenisei* **ssp. nova** (type locality: Siberia, Irkutsk region, Uda river, Nizhneudinsk town vic.). The neotype of *P. a. sibiricus* (Nordmann, 1851) is designated from the vicinity of Irkutsk. The distinctions and relations of the new subspecies are discussed with new data about the synonymy for the Siberian apollo-representatives. New synonymies are established: *Doritis apollo* L. var. *sibirica* Nordmann, 1851 [*Parnassius apollo sibiricus* (Nordmann, 1851)] = *Parnassius apollo pseudosibiricus* Bryk et Eisner, 1938, syn. n., *Doritis apollo* L. var. *hesebolus* Nordmann, 1851 [*Parnassius apollo hesebolus* (Nordmann, 1851)] = *P. apollo tshikoiensis* Möhn, 2003 syn. n., *Parnassius apollo tannuensis* Möhn, 2003 = *Parnassius apollo hirschfeldi* Möhn, 2003, syn. n.

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Keywords

Biodiversity, *Parnassius*, *apollo*, Siberia, Baikal, Khangai, taxonomy, new subspecies, zoogeography, Irkutsk

Introduction

In the vast area from the Ob River to Baikal (on the territory of the main part of the Yenisei River basin) there is not a single described taxon related to *Parnassius apollo* Linnaeus, 1758 (except for subspecies from the Altai, Sayan and Salair Mountains), despite the fact that local populations of this species exist and are very different from both the Baikal and Ob ones.

The new subspecies was collected in the Uda River basin, near the city of Nizhneudinsk in the Irkutsk region, during several different expeditions. The first collections in this area were made by S. Vaschenko (Kherson), during the research planned by the first author of the article. Later, the area was visited by several more expeditions (mostly Ukrainian). Initial attempts to determine the subspecific identity of the population found were unsuccessful due to confusion in the type localities of the various taxa, which could not be resolved in a simple way.

Only now, as part of a review of the entire complex of East Siberian and Daurian butterflies, has it become possible to clarify the situation.

Abbreviations:

FW − fore wings; HW − hind wings; m − m. a.s.l., metres above sea level; TL – type locality.

Material and methods

The adults were photographed using Canon 5DII with Sigma-60 Macro. For wing venation, the Comstock-Needham nomenclature adopted for butterflies (Miller 1970) was used. The present study is based on the collections of the following institutions: Zoological Institute of Russian Academy of Sciences (ZISP, St. Petersburg), Darwin State Museum (SDM, Moscow), Museum of Natural History St. Alexis Hermitage (MSAH, Yaroslavl reg.), collections of the authors, K. Kolesnichenko (Moscow), V. Tuzov (Moscow), B. Khramov (S.-Petersburg), S. Kovalev (Dolgoprudnyi, Moscow reg.), A. Kurmaev and P. Beda (Lyubertsy, Moscow reg.), A. Kryukov (Kirov).

The holotype and the neotype will be deposited in the collection of the Darwin State Museum (Moscow), the paratypes are in the collections of the authors, in the Museum of Natural History St. Alexis Hermitage, as well as in the private collections listed above.

Results

Taxonomical part

1. Neotype designation of Parnassius apollo sibiricus (Nordmann, 1851)

Parnassius apollo sibiricus (Nordmann, 1851) was described from a drawing of a female in a book about the Russian fauna (Eversmann 1851: plate XI: 1), the true diagnosis was not published. However, the validity of this name and taxon has never been questioned. The type specimen is deposited in the museum of ”Helsingfors” [Helsinki] and was collected in the vicinity of Irkutsk (Nordmann 1851: 423), but was never found subsequently. In the same book, *P. a. hesebolus* (Nordmann, 1851) (TL: Khentei) was described.

Until the end of the thirties of the twentieth century, the distribution of this subspecies along the northern shore of Lake Baikal and the environs of Irkutsk was not in doubt. This point of view was

held by L. Sheljuzhko (1924), who described *P. a. meinhardi* Sheljuzhko, 1924 (TL: Petropavlovsk [North-Kazakhstan Province, Kazakhstan]), which inhabits Northern Kazakhstan and Western Siberia, the Irtysh and Ob basins. F. Bryk also adhered to this point of view without any comments or doubts (Bryk 1912, 1935).

However, in 1938, *P. a. pseudosibiricus* Bryk et Eisner, 1938 was described with the same type locality (Baikal). The article itself consists of 12 lines of text, in which three taxonomic acts are performed at once. It was simply stated that F. Bryk made a mistake in 1912 (!), considering Irkutsk as a typical place of *sibiricus*, while the correct typical place is the Irtysh River. No arguments were presented, no specimens were found or re-examined, there was also no explanation of how the new point of view correlated with the indication of Irkutsk as the place of collecting *sibiricus*. However, it was concluded that Sheljuzhko was mistaken and his taxon *meinhardi* is a synonym of *sibiricus*. The Irkutsk-Baikal butterflies remained undescribed and were given the name *pseudosibiricus*. The authors promised to publish details later, which has never been done.

In all the subsequent publications F. Bryk, as well as C. Eisner, held the above point of view. *P. a. pseudosibiricus* was described from the vicinity of Irkutsk; types (including the holotype) appear in various works (Bryk and Eisner 1938: pl. 43 fig. 1, pl. 43 fig. 2; Eisner 1966: 36). Another photograph of the type specimen was published in a French work (Bernardi and Viette 1966: 229). For *sibiricus*, Irtysh was indicated as the type locality (Eisner 1961: 284; Eisner 1976: 155).

This point of view is fully rooted in the Western European tradition and can be found in most Internet sites and modern catalogues. Even in the well-known “The Parnassiinae of the world” the type locality for *sibiricus* is Irtysh (Weiss 2005: 385). In the same book of Weiss there is an obvious error about “paratype” (1851 year of the description!) of *sibiricus* from ”Petropawlowsk” (it is clear that it was just a type specimen of *meinhardi*)! We should also note that E. Möhn's speculations about *pseudosibiricus* (2003: 3) make no sense, as he also places Nordmann's taxon on the Irtysh, in Petropavlovsk, and in the same time publishes the syntypes (?) of *meinhardi* labelled ”Petropawlowsk” (Möhn 2005a, b: 2). H. Glaßl (2017) accepts the above-described concept of the distribution of the subspecies in Siberia.

Russian entomologists had a different position. V. Lukhtanov and A. Lukhtanov (1994: 39) indicate *P. a. meinhardi* for “SW. Siberia (Kurgan, Omsk, Novosibirsk, and Tomsk regions) and N. Kazakhstan (Petropavlovsk, Koktshetav, and Pavlodar regions)” and *P. a. sibiricus* for “Sajan Mountains; in NW Asia – Salair Mountains, Kuznezki Alatau”. Kaabak et al. (1997: 144) indicate as valid subspecies *P. a. meinhardi* for “N. Kazakhstan, W. Siberia” and *P. a. sibirica* for “E. Siberia”. P. Gorbunov (2001: 51) considers *meinhardi* as a synonym of *P. a. limicola* Stichel, [1907] (TL: Ural), and logically synonymizes *P. a. sibiricus* with *P. a. pseudosibiricus*. Y. Korshunov (2002: 194) also agrees on the synonymy of *P. a. sibiricus* and *P. a. pseudosibiricus*, and for the West Siberian plain he indicated *P. a. meinhardi*. S. Knyazev (2009: 445) points that in Omsk Province (Russia, Western Siberia) *P. a. meinhardi* is widespread. V. Ivonin with the co-authors (Ivonin et al. 2009: 95), analyzing the subspecies attribution of apollo from Novosibirsk Province (Russia, Western Siberia), indicated that *P. a. pseudosibiricus* is a younger synonym of *P. a. sibiricus*. The authors regarded this situation in connection with the status and distribution of *P. apollo meinhardi*, confirming that it is this subspecies that is widespread in the vicinity of Novosibirsk. It was noted that the butterflies from the left bank of the Ob are not identical to the normal *meinhardi*, and may be related to the taxon *sibiricus* (which is incorrect, given the characteristics of the latter). A full analysis of the emergence of a complex taxonomic collision was also not provided. Yakovlev et al. (2016: 69−70; Volgin and Yakovlev 2018) also report *P. a. meinhardi* for forest-steppe zone of Altai Province (Russia, South–Western Siberia). In the second edition of Catalogue of the Lepidoptera of Russia (Anikin et al. 2019: 200) for the West Siberian plain *P. a. limicola* is indicated, and for East Siberia – *P. a. sibiricus*.

The current taxonomic confusion is unbearable. To preserve the stability of zoological

nomenclature, it is important to have the name-bearing type of the taxon fixed by the neotype designation (ICZN 1998: 72.2, 75).

Let's consider the Bryk's attempt to move the type locality of *sibiricus* to Irtysh. This point of view (remember, published without any supporting arguments) contradicts several firmly established facts:

– Nordmann's original description clearly states that the butterfly was collected in the vicinity of Irkutsk;

– it was during the publication of the taxon that other descriptions of butterflies from the vicinity of Irkutsk appeared. For example, *Erebia kefersteinii* (Eversmann, 1851) was described in the same year, and Nordmann's article itself contains a description of another subspecies, *P. apollo*, brought from Dauria. There is no doubt that Nordmann could have had material from Irkutsk;

– the very name chosen for the subspecies logically fits Eastern Siberia, and has little to do with Petropavlovsk, the steppe outskirts of Western Siberia, now part of Kazakhstan; Bryk and Eisner did not consider the situation from the point of view of the chosen name at all, since for them the concept of Siberia was an abstraction.

The drawing published by Nordmann is done in a stylized manner and contains a number of features that make subspecies identification very difficult. The presence of a solid white transverse band on the forewing clearly shows that the artist had no idea about the importance of certain coloring details (such a band is simply absent from all species of the complex *apollo*). It is logical to assume that it depicts the submarginal series of whitish spots located between the marginal edge and the dark submarginal band. This series is noticeably better developed in Irkutsk butterflies, females from Irtysh are significantly darker, light spots are usually barely noticeable.

Another feature, the horizontally stretched costal red eye, is very rarely found as a form in various parts of the western part of the species range, while butterflies from the eastern part of the range are characterized by a narrowed and vertically elongated eye. Perhaps it was this very sign that led Bryk to the now incomprehensible abrupt change of position. However, it is on Lake Baikal and in the vicinity of Irkutsk that a significant proportion of females have a round eye (not stretched vertically or horizontally). Both possibilities are possible: the artist could have made another imaginative contribution to the image, the typical specimen could have had an unusual and uncharacteristic feature for the population.

A number of other features depicted in the drawing clearly indicate the Irkutsk population: the female is a relatively light specimen with poorly darkened discal portion of FW and the HW edge – all these are signs of eastern subspecies, not typical for very large and heavily darkened butterflies from Kazakhstan and Western Siberia (see Figs 1: 5−8 and 2: 2−4).

As a neotype we chose a small female, collected in the vicinity of Irkutsk, similar to the image in the original description. FW length 41 mm (wingspan 72 mm), label: Russia, Irkutsk region, Irkutsk city environs, 2.5 km NW Malaya Topka village, Angara river valley, h=450 m, 6.07.2012 (on white thick paper). We added the label: NEOTYPUS / *Doritis apollo* L. / var. *sibirica* / Nordmann, 1851/ Churkin & Yakovlev des., 2024. The neotype is designated to record the type locality, status and characteristics of the taxon from a place as close as possible to that indicated in the original description (ICZN 1998: 75.3.1, 75.3.6). As we marked above, the neotype will be deposited in the collection of the Darwin State Museum (Moscow) (ICZN 1998: 75.3.7)

The photo of the neotype is provided on Fig 1: 7.

Thus, the type localities of the two taxa coincide: ***Doritis apollo* L. var. *sibirica* Nordmann,1851 [*Parnassius apollo sibiricus* (Nordmann,1851)] =*Parnassius***

***apollo pseudosibiricus* Bryket Eisner, 1938, syn. rev.**

As already indicated, between the ranges of *meinhardi* and *sibiricus* there is a huge territory, the basin of the middle reaches of the Yenisei, where, in our opinion, the undescribed subspecies is widespread.

2. *Parnassius apollo yenisei* ssp. nova

https://zoobank.org/58D5D63C-AA18-48EE-9D5B-CA9123C3C610

Fig. 1: 1−4

Holotype: male, Russia, Irkutsk reg., 475 км NW Irkutsk, Nizhneudinsk distr., Uda R., Bolshoi Uk loc., 11−16.06.2011.

Paratypes: 14 males, 12 females, same data; 14 males, 6 females, same loc., Kurjaty st., 13−14.07.2006, E. Proskurjakov leg.; 6 males, 4 females, 8−14.06.2011; 11 males, 8 females, same loc., 450 m, 8−17.06.2011; 4 males, 5 females, Russia, Irkutsk reg., Nizhneudinsk distr., Uda R., Mara st., 16−19.07.2015.

Description. Holotype FW length 39 mm, in male and female paratypes − 37−44 mm (usually 38−42 mm).

Antennae, palpi, body and fringes coloration seem to have no taxonomically valuable characters.

Male. Upperside milky-white with small black spots and two reddish eyes on the HW.

FW: the translucent marginal band narrow, about 3 mm in the middle of the wing, only traces of dark color developed in the field Cu1−Cu2, the field Cu2−2A usually white. The submarginal row developed from the costal side of the FW extending to Cu2 vein and consists of diffuse blackish spots; it is sharply shifted towards the wing base on M2 vein. Between the marginal border and submarginal band there is a number of whitish spots, usually 4 or 5, the width of these spots in the median zone is slightly narrower than the width of corresponding marginal band.

The black spot inside the cell with more or less sharp edges, the discal spot and both costal spots in the postdiscal row have rounded outlines, like the anal spot.

HW: reddish spots are usually oval, sometimes vertically stretched (especially costal), half of the specimens have at least a lower spot with a small white pupil inside. The red color is not bright, unsaturated, pale. Along the anal margin of the wing (in zone 2A-Cu) there are two small stretched blackish spots.

Underside: the size of the spots (both black and red) is slightly smaller than on the upper surface. Red spots always have white ocelli. One of the anal spots sometimes has a red patch. Two lower red basal HW spots are often not normally developed (50% of males), darkened and diffuse – in contrast to the two upper spots.

Variability is normal for the species: sometimes the submarginal row is partially reduced, sometimes expressed, while the median spots in this row can acquire a sharp and arched shape.

Female. The general pattern as in males, all spots are enlarged, FW discal area often with a diffuse blackish suffusion. The marginal band is wider than in males and extends to the anal angle. The submarginal dark band is also enlarged and stretched at least to Cu2 – forming a series of narrow light internal spots (except for fields Cu2-2A). The width of these spots varies greatly.


1
2
3
4
5
6
7
8

Figure 1. ***P. apollo*, adult specimens:** 1 – *Parnassius apollo yenisei* **ssp.nova**, holotype, male, Russia, Irkutsk reg., 475 км NW Irkutsk, Nizhneudinsk distr., Uda R., Bolshoi Uk loc., 11-16.06.2011.2 – *P. a. yenisei* **ssp. nova**, paratype, male, same data as 1.3 – *P. a. yenisei* **ssp. nova**, paratype, female, same data as 1.4 – *P. a. yenisei* **ssp. nova**, paratype, female, same data as 1.5 – *P. a. sibiricus*, male, Russia, Irkutsk, Angara r., 29.06.2011.6 – *P. a. sibiricus*, male, topotype, Russia, Irkutsk region, Irkutsk env., 2.5 km NW Malaya Topka village, Angara river valley, 450 m, 3.07.2011.7 – *P. a. sibiricus*, female, neotype, Russia, Irkutsk region, Irkutsk env., 2.5 km NW Malaya Topka village, Angara river valley, 450 m, 6.07.2012.8 – *P. a. sibiricus*, female, topotype, same data as 7.

The HW reddish spots are pale and unsaturated and more often than in males without white pupils (or with weakly marked ones). The submarginal dark pattern on the HW is expressed but not contrasting, discal zone is whitish but not bright, all pattern is not contrasting.

HW underside with fully developed 4 basal red spots, the anal spot here is often with red patch.

Variation is common for the species, white pupils sometimes more expressed, and, very rarely, the colour of the red HW eyes is deep and cherry. Some females are lightened, some darkened.

Diagnosis. New subspecies differs from the western ssp. *meinhardi* (Fig. 2: 3−5) by a narrow marginal band – so that submarginal whitish spots have almost the same width as the band. The males of *meinhardi* have the marginal band is twice as wide; the whitish spots are almost twice as narrow as the band. At the same time, the black submarginal row develops almost equally in both subspecies, but in *meinhardi* the spots in the middle part are usually arched and have sharp borders (this form is rare in the new subspecies). Postdiscal (costal) spots have practically the same size in both subspecies, which, with a difference in the development of the marginal band, indicates the genetic differences (i.e., different parts of the pattern are developed to different degrees, and therefore, the difference in pattern is not a result of just phenotypic variability).

New taxon differs from the eastern ssp. *sibiricus* (Fig. 1: 5−8) by the developed black pattern on the FW in males (in *sibiricus* the submarginal row is partially or completely reduced – taking into account the inevitable variations, the reduced black pattern unites a group of subspecies to which the ssp. *yenisei* does not belong).

Also from both neighbouring taxa *yenisei* **ssp. nova** is distinguished by the smaller and pale unsaturated reddish spots; the white ocelli are poorly developed or not contrasting (females of *sibiricus* usually have cherry reddish HW spots with well developed white ocelli).

The new subspecies is sharply smaller in size than *meinhardi* (FW length is usually 45−51 mm, 30 pieces were measured, but 5 females only) and – statistically, but noticeably – smaller than *sibiricus* (FW length is usually 40−45 mm with unusual exception 48 mm, 15 males and 10 females were measured). Measuring a large butterfly has its own particularity and can give a big difference depending on variant of the wings spreading (depend of the positions of the FW base, etc.) – so it makes sense to compare relative data, rather than some absolute values from different authors.

Figure 2. ***P. apollo*****, adult specimens:** 1 – *P. a. sibiricus*, male, Russia, Buryatia, Barguzin Mts., Nesterikha r., 650 m, 1.07.1993.2 – *P. a. meinhardi*, male, Russia, Novosibirsk reg., Barabinskaya steppe, Kunino v., 14.07.2001.3 – *P. a. meinhardi*, male, Kazakhstan, Akmola reg., Borovoye, 25.06.1927.4 – *P. a. meinhardi*, female, Kazakhstan, Akmola reg., Krasnaya Poljana vic., 3.06.1974.

We do not compare the characters of the new taxon with subspecies which distribution areas are not bordered, but we will discuss later the general subspecific situation in the Eastern Siberia and Mongolia.

Bionomics. Cliffs, rocky outcrops, forest edges. Feed plant – *Orostachys* sp. (probably, *O. spinosa* (L.) C.A. Meyer). Flies together with *P. phoebus* (Fabricius, 1793), that is absolutely unusually for Siberia and Far East (Churkin & Yakovlev 2024, in press), with the exception of the northern part of the Russian Altai (Beloe village in the Altai Provence; Cherga village in the Altai Republic) (Tshikolovets et al. 2009).

Distribution. Known only from the type locality, where it was collected at several close points. The Uda River flows into the Chuna, which belongs to the Yenisei River Basin. Probably distributed sporadically throughout the middle reaches of Uda River. Certainly, the distribution area of the subspecies is fully isolated from that of neighbouring taxa.

Etymology. Toponimic name.

3. Subspecific structure in East Siberia, Dauria and Mongolia

In conclusion, we will express our point of view on the recently described Siberian taxa.

Comparison of a large amount of material from Dauria and the adjacent part of Mongolia shows the identity of populations throughout the indicated territory (which is logical, given that even small blues do not form subspecies within this zoogeographic region) (Fig. 3). We compared long (sometimes dozens of copies) series collected in the Transbaikal Territory (Ingoda r., Kilok vic., Yablonovaya st. vic.) and Mongolia (Sukhe-Bator aimak, Burentzogt somon; Ulan-Bator, Zhidzhid vic.; Central aimak, Batsumber somon; Central aimak, Erdene somon; Selenge aimak, Zuunkharaa somon; Bulgan aimak, Bayan-Agt somon), no fundamental differences were found: light males with a serious reduction of the black pattern, and smoky females.

Thus, ***Doritis apollo* L. var. *hesebolus* Nordmann, 1851 [*Parnassius apollo hesebolus* (Nordmann,1851)] (TL:Khentei)= *P. apollo tshikoiensis* Möhn,2003 (TL: Chikoi r.) syn. n.** (Möhn 2003a, 2003b).

The type locality of *hesebolus* was never clarified. It is highly likely that the specimens were collected at the vicinity of Bukukun village, situated in South Transbaikalia, not far from the Mongolian border and not so far from Sokhondo natural reserve (Onon River basin, 49°26'59'' N, 111°8'5'' E). Important to note that G. Radde exactly marked this area as a part of Dahuria (Radde 1861). This locality is figured in the diaries of Russian expeditions of that time and was opened as type locality of *Melitaea arcesia* Bremer 1861 (Churkin et al. 2022). It is very possible that the place was favorite at the middle of XIX century among scientific expeditions and collectors as placed at the known road and safely for the travelers.

The series we have from the Khilok region was collected in the Khilok River basin, a tributary of the Selenga River adjacent to the Chikoi River – the distance between the main rivers does not exceed 75−80 km, there are no barriers for this species. It should be noted that the female *tshikoiensis* selected as the allotype represents only the most darkened specimen; the series also contain the same specimens, as well as sharply lightened ones. The very idea of describing subspecies based on one pair or even one male (see below) is illiterate from the point of view of the biological concept of species.

In the series of butterflies from Sukhe-Bator aimak, closer to Khamar-Daban Range, there are females that resemble ssp. *burjaticus* Nardelli & Hirschfeld, 1994 – the females of the latter are distinguished by a distinct pattern and widened eyes (nevertheless, the series undoubtedly belongs to *hesebolus*).

The mentioned above *burjaticus* is close to Baikal/Irkutsk *sibiricus*, but we consider it appropriate to preserve this subspecies, which is distinguished by its large size and clear, distinct range, covering the lower basin of the Selenga River (primarily the environs of Ulan-Ude and the surrounding ridges, including the southern macroslopes of Khamar-Daban Range).

We also have a series collected in the Barguzin River valley, which is somewhat different from *burjaticus*, but generally corresponds to it (Fig. 2: 1).

P. a. wiljuiensis Möhn, 2003 (Möhn 2003a, b) from Central Yakutia, inhabiting the Lena River basin, apparently belongs to the same group of subspecies with the reduced black pattern. The females are more reminiscent of *hesebolus* than *sibiricus*

– and this is another case of the relationship between the Yakutian and Amur faunas

– an important zoogeographic fact.

The taxon *P. a. sojoticus* Bryk, 1912 also belongs to the group *hesebolus*, with some increase in black markings, especially in males. The taxon was described from 'Arasagun-Gol', this locality was only recently deciphered by the authors of this article and is located slightly south of Lake Khovsgol [Hovsgol, Khövsgöl, or Huvsgul] in Mongolia (Churkin & Yakovlev 2024, in press). The subspecies

is distinguished by its small size; its range includes the Tunkinskaya Valley and the territory between the Eastern Sayan Mountains system and Khangai Mountains (or only the southern foothills of the Eastern Sayan). We have (in addition to the published photographs, including the typical ones, excellent color photographs – see Möhn 2003: plate 2) a small series collected in the vicinity of Tsetserleg somon [village] on the Northern Khangai, similar to *sojoticus* (the series is too small and the butterflies are not fresh and could be *hesebolus* as well). A small series from the Orkhon River (a tributary of the Selenga) in the mountains south of Bulgan includes both variants of the females (i.e. typical for *hesebolus* and typical for *sojoticus*), clearly being transitional, that is logical.

P. a. zavchanensis Möhn, 2003, TL – 45 km WNW Numrok somon, Zavkhan aimak, Mongolia.

The taxon is described from one pair, very similar to the type pair of *sojoticus*, enlarged in size, but lighter. We have two large and light males collected by V. Soljanikov in the vicinity of Tosontzengel somon [village], nearby Numrok. It is probable that *zavchanensis* is a synonym of *sojoticus* Bryk, 1912 – or, rather, of *hesebolus* itself, penetrating the lowlands between the ridges – but with such fragmentary material the synonymization with one of these subspecies would be premature.

P. a. churkini Möhn, 2003 inhabits the Southern Khangai Mts, its range is clearly isolated from the rest, the butterflies are distinguished by a sharp, developed black submarginal pattern (the females have no traces of smoky coloration), large size and a number of other features. It should be noted that, unlike many other subspecies, this one was described from a large series, at the insistence of the first author of this article (Möhn 2005a).

The two remaining new subspecies were described from Tuva Republic (Russia, Southern Siberia), one of them based on a single male – *P. a. tannuensis* Möhn, 2003

– from the Ak-Dovurak district, Western Tannu-Ola Range (a weird female appears in Möhn 2005a: 50, without explanation of where it came from and why it was not included in the type series). The second subspecies – *P. a. hirschfeldi* Möhn, 2003

– described according to one pair from the surroundings Khovu-Aksy village, Eastern Tannu-Ola Range. Both typical sites are located on the northern slopes of two ridges on small tributaries of the Yenisei within the single central Tuvan basin. The butterflies are obviously close to *sojoticus*, the only female is clearly smoky despite the darkening, the males differ only in size. We have 2 males collected on the Buren River, east Tannu-Ola Range, one of which is very similar to *tannuensis*, the second is larger and similar to *hirschfeldi*. From a zoogeographic point of view, Central Tuva may have its own subspecies of *apollo*, but there is no doubt that ***Parnassius apollo tannuensis* Möhn, 2003 = *Parnassius apollo hirschfeldi* Möhn, 2003, syn. nova.** As the first reviser, we choose the toponymic name *tannuensis* Möhn, 2003 as the one that best describes this subspecies.

It should be noted that the entire complex of Tuva-Sayan-Khangai subspecies is easily distinguished from the above described subspecies from the north (from the valley of the middle reaches of the Yenisei) in a series of characters (primarily due to the lack of smoky markings in females and the clearly expressed black pattern in males). The new subspecies falls somewhat outside the “northwestern” subspecies group (although it shows similarities with the western *meinhardi*), which speaks of its separate formation.

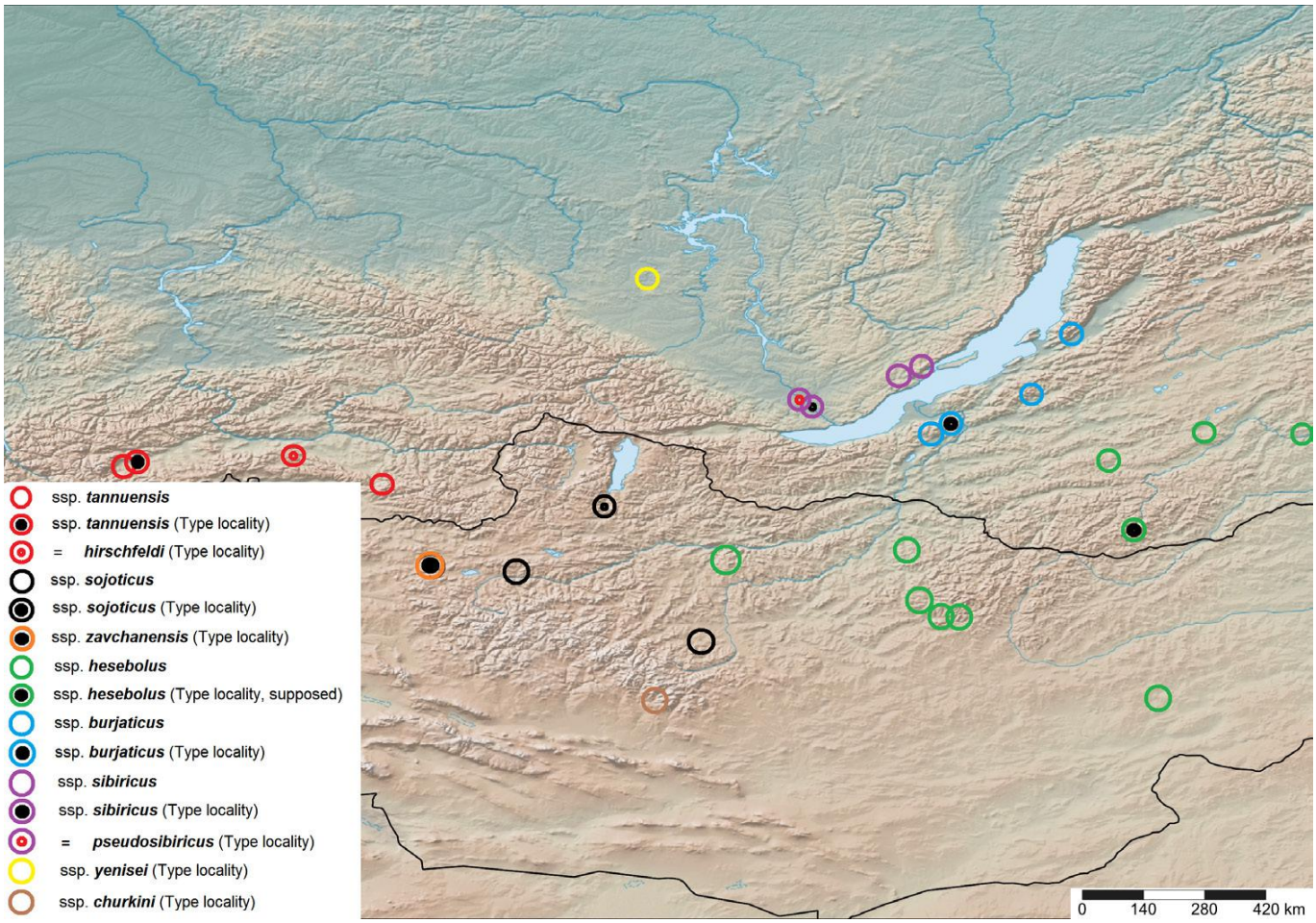

Figure 3. *Distributional map of P. apollo in the Eastern Siberia and Mongolia.*

E. Möhn represents the now archaic tendency to describe an infinite number of subspecies based on 1−2 specimens. Another, much more obvious tendency of European authors is an attempt to reduce the number of taxa of diurnal butterflies on the territory of Russia (for example, Rose and Weiss 2011). The main reason for this is that European colleagues project their own situation onto someone else's: in Europe the number of described taxa for any group of butterflies has long been clearly excessive, while in Russia and Central Asia the inventory of fauna is not yet complete, from many places there are no specimens at all.

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