

**New records of butterflies for the Tyva Republic [Tuva].
II. Hitherto not reported species and some considerations
about the *Erebia magdalena* STRECKER, 1880
and *Polyommatus icarus* (ROTTEMBURG, 1775) groups**

(Lepidoptera, Diurna)

by

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Abstract: Recent collections made in Tyva Republic (Tuva) yielded 11 species so far not specially recorded for this territory. Seven of them (*Spialia orbifer* (HÜBNER, [1823]), *Pyrgus sibiricus* REVERDIN, 1911, *Parnassius stubbendorffii* (MÉNÉTRIÉS, 1849), *Brenthis daphne* ([DENIS & SCHIFFERMÜLLER], 1775), *Erebia pandrose* (BORKHAUSEN, 1788), *Aricia chinensis* (MURRAY, 1974), *Plebejidea cyane* (EVERSMANN, 1837)) were quite expectable as known from the adjacent regions. Records of *Erebia magdalena erynnin* WARREN, 1932, *Erebia dabanensis* ERSHOV, [1871], *Oeneis melissa tunga* STAUDINGER, 1894 are interesting as extending westwards the known range of this taxa from the East Sayan Mts; the first finding of *Hyponephele narica* (HÜBNER, 1808–1813) in Siberia is discussed in another paper. Specimens of *Thersamonolycaena dispar* (HAWORTH, 1803) from the Ubsu-Nur Hollow are attributed to ssp. *aurata* (LEECH, 1897). Taxonomy of *Erebia magdalena* STRECKER, 1880 s.l., and the status of *Polyommatus icarus korshunovi* GORBUNOV, 1995 s.l. are discussed; the holotype and two female paratypes of the latter taxon are depicted.

Резюме: Недавние сборы в Республике Тыва (Тува) дали 11 видов, до сих пор не отмеченных для этой территории. Семь из них (*Spialia orbifer* (HÜBNER, [1823]), *Pyrgus sibiricus* REVERDIN, 1911, *Parnassius stubbendorffii* (MÉNÉTRIÉS, 1849), *Brenthis daphne* ([DENIS & SCHIFFERMÜLLER], 1775), *Erebia pandrose* (BORKHAUSEN, 1788), *Aricia chinensis* (MURRAY, 1974), *Plebejidea cyane* (EVERSMANN, 1837)) были в достаточной степени ожидаемы, так как известны из прилежащих территорий. Обнаружение *Erebia magdalena* STRECKER, 1880 *erynnin* WARREN, 1932, *Erebia dabanensis* ERSHOV, [1871], *Oeneis melissa tunga* STAUDINGER, 1894 интересно, так как расширяет известные ареалы этих видов к западу от Восточного Саяна; первая находка в Сибири *Hyponephele narica* (HÜBNER, 1808–1813) обсуждается в другой статье. Экземпляры *Thersamonolycaena dispar* (HAWORTH, 1803) из Убсу-Нурской котловины отнесены к ssp. *aurata* (LEECH, 1897). Обсуждается таксономия *Erebia magdalena* STRECKER, 1880 s.l. и статус *Polyommatus icarus korshunovi* GORBUNOV, 1995 s.l.; у второго изображены голотип и два паратипа (самки).

The Tyva Republic is situated in southern Central Siberia and occupies the water catchment basin of the Yenisei River sources south of the Sayans, and also the northern part of the Ubsu-Nur Intermontane Hollow (mostly situated in Mongolia). In general its territory lies between 49°45' and 53°43' N and 88°48' and 99°15' E. Further in the text the traditional Russian

name "Tyva" will be used but the present official name "Tyva" is a more precise transliteration of the self-naming of the Tuvians.

During an expedition to Tyva in July 2000, kindly supported by Prof. T. FUJIOKA (Tokyo, Japan), I collected 7 species hitherto not reported for this Republic (plus one more found in 1990). One of this findings will be soon described as a new subspecies *Hyponephele narica ambaltaica* KOSTERIN in litt., the others are reported herewith. In June 2001, Dr. I. I. LYUBECHANSKII, Dr. R. A. DUDKO (Institute of Systematics and Ecology of Animals of Siberian Division of Russian Academy of Sciences) and A. A. DUDKO have collected three more hitherto not recorded species, although one of them was already collected in 1989 by I. V. TISHIN and identified by Dr. V. K. Tuzov (pers. comm.), but this was not published. The mentioned persons kindly allowed me to publish these finding here. The materials collected also inspired to discuss the range and status of two Lycaenidae subspecies and the intraspecific taxonomy of *Erebia magdalena* STRECKER, 1880 s.l. and *Polyommatus icarus* (ROTTEMBURG, 1775). The material mentioned in this paper is preserved in the Siberian Zoological Museum at the Institute of Systematics and Ecology of Animals of the Siberian Division of the Russian Academy of Sciences, Novosibirsk (SZMN) and in the collection of Prof. Tomoo FUJIOKA (Tokyo).

Spialia orbifer (HÜBNER, [1823])

Material: Tyva Republic, Tes-Khem District, the Shivilig-Khem River gorge several km upstream of its leaving the East Tannu-Ola Mts., 50°47'N 94°36'E, a steppefied terrace meadow, 1.VII.1990 – 1 spec. (O. KOSTERIN leg.).

This Transpalearctic species is local and never abundant, that is true for Tyva as well, since it was never reported from there and now is reported by a single specimen.

Erebia magdalena STRECKER, 1880 *erynnin* WARREN, 1932 (= *Erebia erynnis* STAUDINGER, 1894, homonym; *Erebia erynna* STAUDINGER, 1894, homonym, = *E. sajanensis* KORSHUNOV, 1972, homonym).

Material: The border of Tyva and Khakas Republics, the Saylyg-Khem-Taiga Mt. Range; the Sayanskii Pass (of the road Abaza-Ak-Dovurak), 51°42'N 89°52'E, 2500 m above sea level, large-stoned screes at local mountain tops, 7.VII.2000 1 ♂, 1 ♀ (col. pl. VIII, fig. 1) (O. KOSTERIN leg.).

On 7th July 2000 on the Saylyg-Khem-Taiga Mt. Range (representing the central axis of the West Sayan Mts.) dividing the Tyva and Khakas Republic, I collected a male and female belonging to the *Erebia magdalena* STRECKER, 1880 group, hitherto unknown for the West Sayan. They were found on large-stoned screes at local mountain tops. Geographically the closest representative of this group is the so-called *Erebia erynnin* WARREN, 1932, considered as ranging in the East Sayan (the Tunkinskii Gol'tsy and Munku-Sardyk Mts., the latter being the type locality) (KORSHUNOV & GORBUNOV, 1995) and the Baikal area (Tuzov et al., 1997). Recently its subspecies *E. erynnin chara* CHURKIN, 1999 has been described from the Kodar Mts (N. Transbaikalia) (CHURKIN, 1999). The close taxon *E. magdalena sachaensis* DUBATOLOV, 1992 (= *ola* KORSHUNOV, 1995, mentioned also as a subspecies of *Erebia mackinleyensis* GUNDEL, 1932 sensu KORSHUNOV & GORBUNOV, 1995 and *Erebia semo* GRUM-GRSHIMAILO, 1899

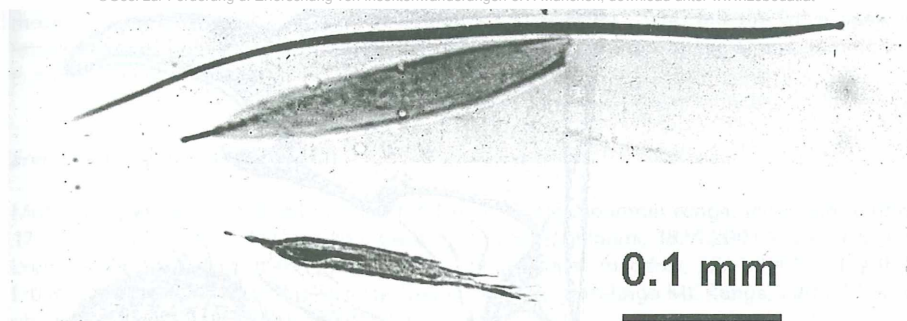


Fig. 1: A hair (above), an eomorphic androconial scale (in the middle), and a palaeomorphic androconial scale (below) found on the forewings of the male of *Erebia magdalena* STRECKER, 1880 *erynnin* WARREN, 1932 collected on the Saylyg-Khem-Taiga Mt. Range; the Sayanskii Pass, 7.VII.2000. A regular scale not shown.

sensu KORSHUNOV, 1996 et 2000) ranges from Yakutia and the mountains of Bureya to Magadan Province and Chukotka (KORSHUNOV & GORBUNOV, 1995; TUZOV et al, 1997; GORBUNOV, 2001). The nominotypical *E. magdalena* STRECKER, 1880 has been described from Colorado, another subspecies *mackinleyensis* GUNDER, 1932 is present in Alaska and the Rocky mountains (SCOTT, 1986). The main features thought to distinguish *E. erynnin* from *E. magdalena sachaensis* are the presumed absence of real (paleomorphic or neomorphic sensu WARREN, 1932) tufted androconial scales on the male wings (while *E. magdalena sachaensis* has quite variable palaeomorphic scales, shown in KORSHUNOV, 1996) and, in the male genitalia, a wider tegumen, a shorter valva with a more or less expressed neck and more blunt and inwards curved apices, so that valva sometimes looks somewhat truncated in lateral view, and a less sclerotized distal part of the aedeagus (LUKHTANOV & LUKHTANOV, 1994; KORSHUNOV & GORBUNOV, 1995; CHURKIN, 1999).

However, PAVEL GORBUNOV, who examined my West Sayanian male specimen, has found palaeomorphic scales, although extremely rare, among abundant eomorphic (elongate but without a tuft) scales and hairs, just below the lower cell vein of on the wings of the male as well (GORBUNOV, 2001). I prepared and examined myself eight (!) slides from the same wing area and found one palaeomorphic scale (fig. 1). Additional fresh material from the West Sayan would be most welcome to study the real frequency and the range of shapes of the androconial scales in tuhe local population.

We should take into account that the butterflies of this group could have reached the West Sayan (presently the west extremity of the group's range) only through the East Sayan, that is the type locality of *erynnin*. This would allow to suggest that the androconial scales can be present in the East-Sayanian *erynnin* as well, at least in some specimens. Consequently, the difference between *erynnin* and *magdalena* may refer just to abundance of real androconial scales. Indeed, the androconial scales are obviously a plesiomorphic character for all butterflies, and cannot be considered as apomorphic for different *Erebia* species, as WARREN (1932) thought. This means that their absence or scarcity can result only from turning off the genetic programme transforming normal scales into androconial ones. In the taxon *erynnin*, this

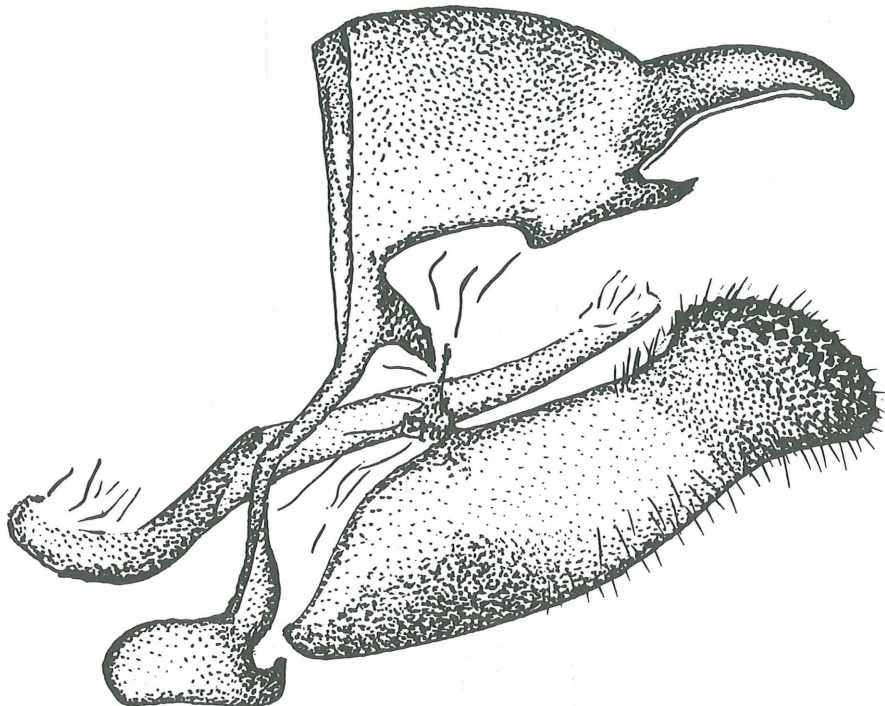


Fig. 2: The genitalia structures of the male of *Erebia magdalena* STRECKER, 1880 *erynnin* WARREN, 1932 collected on the Saylyg-Khem-Taiga Mt. Range; the Sayanskii Pass, 7.VII.2000, courtesy by PAVEL Y. GORBUNOV.

programme does work, although incompletely expressed, to produce numerous eomorphic scales, being the first steps of transformation of scales to the androconial ones. Our finding may indicate that in some scales this program can be expressed completely.

GORBUNOV (2001) considers that the differences in genitalia between *erynnin* and *magdalena* is insufficient for species separation, since the valva shape is very variable within the group, and they are at the level of good subspecies. The differences in androconial scales may also, as we have seen, be of a quantitative nature. Therefore, following Tuzov et al. (1997) and GORBUNOV (2001), I refer to the taxon *erynnin* as a Sayanian subspecies of *Erebia magdalena* and attribute my specimens to it.

The lighter chestnut central area is expressed on both sides of the forewing in the female and only on the underside in the male; on the hindwing underside of the female the traces of the reduced medial band can be noticed (col. pl. VIII, fig. 1). Hence, the lighter areas are much less expressed than in the specimens from Mondy, the East Sayan, described and drawn in KORSHUNOV (1996), with a lighter area well expressed on both wing sides in males and also on the hindwing upperside in females, but are almost identical to specimens from the very same

place depicted in (Tuzov et al, 1997). The genitalia of the West Sayanian male (fig. 2) resemble those of the lectotype of *E. erynnin* (LUKHTANOV & LUKHTANOV, 1994) but the valva apex, in lateral view, is somewhat more stretched out, as if a bit shifted to the shape common in *E. magdalena sachaensis*.

Erebia dabanensis ERSHOV, [1871]

Material: Tyva Republic, Kyzyl District, the Dongul-Taiga mountain range, mountain tundra, 17.VI.2001 1 ♂ (R. A. DUDKO leg.); the same range, highlands, 18.VI.2001 1 ♂, 1 ♀ (I. I. LYUBECHANSKII & R. A. DUDKO leg.); the same range, alpine meadow, 22.VI.2001 1 ♀ (I. I. LYUBECHANSKII leg.); Tyva Republic, Kyzyl District, the Khertesh-Taiga Mt. Range, 2000–2500 m above sea level, 20.VI.2001 – 3 ♂ (I. I. LYUBECHANSKII leg.).

As in the previous species, the hitherto known westernmost locality of this one was the East Sayan. Now it was collected by Drs. I. LYUBECHANSKII and R. DUDKO on the Dongul-Taiga and Khertesh-Taiga mountain ranges being the western spurs of the Academician Obruchev Upland (or Range), the latter representing its main axis. The two ranges face the Ulug-Khem (Large Yenisei) River and form the left board of its quite a steep gorge. 300 km to the East, on its opposite end, the Obruchev Upland is joint to the East Sayan, so this finding is not too surprising. Yet this is the first report of this species for the Republic.

Oeneis melissa (FABRICIUS, 1775) *tunga* STAUDINGER, 1894

Material: Tyva Republic, Kyzyl District, the Dongul-Taiga mountain range, mountain tundra, 17.VI.2001 1 ♂ (R. A. DUDKO leg.); the same range, highlands, 18.VI.2001 1 ♂, 1 ♀ (I. I. LYUBECHANSKII & R. A. DUDKO leg.); the same range, alpine meadow, 22.VI.2001 1 ♂ (I. I. LYUBECHANSKII leg.).

The taxon *tunga* was described from the East Sayan, that was thought to be the westernmost part of the species' range in South Siberia. In 1989 it was collected in the Todzha Hollow in NE Tuva by I. V. TISHIN and determined by Dr. V. K. Tuzov (pers. comm.) but this finding was not published. This new record of *Oe. melissa* is simultaneous and fully analogous to the above considered finding of *Erebia dabanensis* and represents the presently known westernmost locality of this species.

Brenthis daphne ([DENIS & SCHIFFERMÜLLER], 1775)

Material: Tyva Republic, city park of Kyzyl: 51°43'N 94°27'E, alt. 650 m, open riparian poplar forest, 9.VII.2000 – 4 ♂♂; 18.VII.2000 – visually; 29.VII.2000 – visually; 30.VII.2000 – 1 ♂ (O. KOSTERIN leg.).

This species is widespread throughout the Palaearctic (mostly in the semiarid zone) and its presence in Tuva was expected with certainty, as absence from the checklists was rather accidental. The species was observed as numerous and collected in the city park of Kyzyl, being the left bank floodland of the Kaa-Khen (Lesser Yenisei) River covered with poplar (*Populus laurifolia* LEDEB.) parkland.

Thersamonolycaena dispar (HAWORTH, 1803) *aurata* (LEECH, 1807) (= *parva* (KURENZOV, 1941); = *dahurica* (GRAESER, 1888))

Material: Tyva Republic, Erzin District, sedge lake bank on the Tes-Khem right bank floodland 5 km SW of v. Erzin, 50°15'N 95°06'E, 13.VII.2000 – 1 ♂ (O. KOSTERIN leg.); Tyva Republic, Erzin District, a dry sandy steppe with *Caragana bungei* NW bank of Lake Tere-Khol', 50°03'N 95°00'E, 15.VII.2000 – 2 ♂♂, 2 ♀♀ (col. pl. VIII, fig. 2) (O. KOSTERIN, N. PRIIDAK leg.).

These butterflies collected in Erzin District undoubtedly belong to subspecies *aurata*. They demonstrate the diagnostic features of this subspecies (KORSHUNOV & GORBUNOV, 1995): a coffee-gray, without a blue tint, hindwing underside with well expressed black submarginal spots, and, in the males, absence of the black discal spot on the forewing upperside (col. pl. VIII, fig. 2). Earlier this subspecies was thought to range in Transbaikalia and more easterly (KORSHUNOV & GORBUNOV, 1995). Most probably, it inhabits also Mongolia. Tuzov et al. (1999) listed two eastern subspecies: “ssp. *dahurica* (GRAESER, 1888) – Transbaikalia” and “W. Amur region”; and ssp. *aurata* (LEECH, 1887) (= *borodowskyi* (GRUM-GRSHIMAILO, 1900); = *parvus* (KURENZOV, 1941) – “Central Siberia, E. Amur and Ussuri regions” Unfortunately, they did not report characters by which they distinguished these two subspecies, that would be very important in the case of such a strange distribution (the range of *dahurica* situated within the range of *aurata*).

Aricia chinensis (MURRAY, 1974)

Material: Tuva Republic, at city Kyzyl, dry stony steppe on the southern slope of the mountains on the Ulug-Khem River right bank, 51°43–44'N 94°26'E, alt. 650–1000 m, 17.VII.2000 – 1 ♂ (O. KOSTERIN leg.).

This species is known from the regions situated just to the north (Lake Shira in Khakasia, the Tagar island at Minusinsk in the Krasnoyarskii Krai Province) and to the south (Mongolia) of Tuva (KORSHUNOV & GORBUNOV, 1995) but somehow was not hitherto found from Tuva itself. Now we are filling this gap.

Plebejidea cyane (EVERSMANN, 1837)

Material: Tyva Republic, Kyzyl District, the Malyi Shivilig River valley – 1 ♀ (I. I. LYUBECHANSKII leg.).

Again, a species quite expected but for some reason not yet reported for Tuva. It is monophagous and so strictly connected to *Gonialimon speciosum* (Plumbaginaceae), which is quite common in Tuva. Now a female was collected in the Malyi Shivilig River valley which descends from the Dongul-Taiga range southern slope and falls into the Bii-Khem (Large Yenisei) River.

Polyomatus icarus (ROTTEMBURG, 1775) *korshunovi* P. GORBUNOV, 1995

This subspecies was described by P. GORBUNOV in KORSHUNOV & GORBUNOV (1995) in Russian; below is an English translation (references to figures are introduced here):

"In the populations of S Siberia the appearance of butterflies is very diverse. However, in arid regions on the average smaller individuals, with somewhat narrower wings, a whitish wing underside ground colour in males and grayish in females, evidently predominate. The orange submarginal spots in them are smaller than in the butterflies from more northern regions and are isolated from each other. The females have or have not red small submarginal lunules on the wing upperside, which is often substantially suffused with blue scales. Based on these characters we state a subspecies *Polyommatus icarus korshunovi* P. GORBUNOV, sbasp.n.

Material: the holotype, male (col. pl. IX, figs. 1a, 2a) – 26.05.1990, Tuva, the Erzin River valley (V. V. DUBATOLOV). Paratypes: a male – the same locality; 2 females – 27.07.1972, Tuva, Toora-Khem (Yu. P. KORSHUNOV); a female – 19.08.1962, Tuva, the Tes[-Khem] River (L. VIOLOVICH); a female and male – 17.06.1963, the same locality; 2 males – 18.06, 1987, Tuva, the Toszha District, Lake Azas, (V. ZINCHENKO); a male – 1-5.05.1993, Tuva, the Kyzyl city environs (D. LOGUNOV); 2 males – Tuva, the Shivilig-Khem River, a bushy steppe (O. KOSTERIN); 3 males – 21.06. 1907, SE Altai, the Chuiskaya Steppe, Kosh-Agach; a female – 13.07.1997, the Chuiskii Tract road; the Kuraiskaya Steppe [collector is dropped – it was E. G. RODB]; a female – 19.07.1966, SE Altai, between the mountain Supor and the Chuiskaya Steppe, 2000–2400 m [above the sea level]."

First of all, it should be noted that the inclusion of the specimens from the Todzha Hollow (namely, 2 females from Toora-Khem and 2 males from Lake Azas) into the type series was misleading. Most probably, this was done automatically by preposition that all the Tuvian populations are homogenous. In fact, the Todzha Hollow differs drastically from the rest of Tuva, this is a rather humid woody area resembling the East Sayan and Baikal regions by its natural conditions. I examined the type series and visited Todzha on 20–27th July 2000 and collected *P. icarus* just at Toora-Khem and Azas. The specimens from Todzha, including the paratypes of *korshunovi*, are very different from those of arid Central and Southern Tuva: their wing underside ground colour is grayish in males and brownish-gray in females, the submarginal spots are large and contact each other but in males are often very bleached, yellowish and almost lacking the colour. The females show no blue suffusion above.

In our paper (IVONIN & KOSTERIN, 2000) we have attributed to ssp. *korshunovi* the butterflies from the highlands of the Yuzhno-Chuiskii Mt. Range in SE Altai (plate XIII: 9, 10). There all the females were deep violet-blue from above, but their red submarginal spots on the wing underside are quite large and contacting each other, as in the common Siberian ssp. *fuchsi* (ШЕЛУЗЬКО, 1928). Therefore, these butterflies cannot be considering as exemplifying ssp. *korshunovi* and perhaps represent a transition to *fuchsi*, being closer to the latter.

Specimens of *P. icarus* from Central Tuvian and Ubsu-Nor Hollows are very peculiar and fit well to the above translated description, being indeed quite different from those of more humid areas of Siberia, mostly by a light underside background and small and isolate but very bright and distinct submarginal orange spots in males. The same trend is seen in the females in which, however, the ground colour is darker and the orange spots often contact each other. Moreover, in our specimens collected in July the subspecific characters are even better expressed than in the holotype and those paratypes which were collected in May (col. pl. IX, figs. 1d–f, 2d–f). One female collected at Erzin (col. pl. IX, figs. 1e, 2e) has a bright-blue wing upperside, on both wings with diffuse dark areas along the costa and dark submarginal spots accompanied inside with diffuse dark chevrons without spots.

Hence, the name *korshunovi* should be attributed to an indeed clear-cut subspecies of the arid regions of Central and southern Tyva and the adjacent regions of Mongolia. Recently Tuzov et

al. (1999) referred to *korshunovi* as a synonym of the taxon *szabokyi* BALINT, 1990, described from southern Mongolia as a species, which, in turn, was considered a subspecies of *Polyommatus (icarus) kashgarensis* MOORE, 1878, earlier known as *Polyommatus persica* BIENERT, [1869], nom. praecox. We had the opportunity to examine the two paratypes, a male and female, of *P. szabokyi* preserved in the Siberian Zoological Museum, with the labels "MONGOLIA, Jh - Bogd., Orog-Nuur, 1988 - VIII, 3, leg. SZABOKY Cs." These butterflies exhibit an extreme expression of the same trend of reduction of the submarginal spots and lightening of the wing underside ground colour. The type series of *korshunovi* (excluding the Todzha specimens) are about intermediates between the "true" *P. icarus* (ssp. *fuchsi*) and *szabokyi*. This fact indicates that most probably there exists a cline of character change among conspecific forms from rather humid ranges of Siberia through Central and South Tyva to the most arid Central Asia. Hence, we would not synonymize *korshunovi* and *szabokyi* and doubt in species independence of *Polyommatus kashgarensis* from *P. icarus*. According to observations of V. V. DUBATOLOV in the Kopet-Dagh Mts. (pers. comm.), the second (summer) brood has very well expressed diagnostic characters of *kashgarensis* while the first (spring) brood is much closer to typical *icarus*. This indicates that the mentioned characters are most probably environmentally determined. If so, the characters considered may have no taxonomic value, but for synonymization serious studies are required.

Besides, there are a number of highland species observed on 7th July on the Sayanskii Pass (see the label of *E. magdalena*), that is on the very border of Tyva Republic, which were not mentioned for Tuva in the literature. We think that most of them should be observed in this place by Y. P. KORSHUNOV but he for some reason did not include them into the Tuvian fauna in his two special publications about it (KORSHUNOV, 1973 and 1979). It is clear that these species do belong to this fauna as inhabiting highlands at least along the northern border of Tuva and should be added to the checklist of this Republic. These species are as follows: *Pyrgus sibiricus* (REVERDIN, 1911) (common), *Parnassius stubbendorffii* (MÉNÉTRIÉS, 1849) (common), *Boloria napaea altaica* GROUM-GRSHIMAILLO, 1893 (a single male; this taxon was hidden in KORSHUNOV (1973, 1979) under the name *Boloria pales*), *Erebia pandrose* (BORKHAUSEN, 1788) (numerous).

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Explanation of colour plate VIII (p. 239):

Fig. 1: *Erebia magdalena* STRECKER, 1880 *erynnin* WARREN, 1932. The Saylyg-Khem-Taiga Mt. Range; the Sayanskii Pass, 7.VII.2000: ♀ (above) and ♂ (below), upperside (left) and underside (right).

Fig. 2: *Thersamonolycaena dispar* (HAWORTH, 1803) *aurata* (LEECH, 1897). NW bank of Lake Tere-Khol' 15.VII.2000: ♂ (above) and ♀ (below), underside (left) and upperside (right).

1
2

Explanation of colour plate IX (p. 241):

Fig. 1: *Polyommatus icarus* (ROTTEMBURG, 1775) *korshunovi* P. GORBUNOV, 1995; upperside. a – holotype ♂: [S Tuva / Erzin / river Erzin flood-plain / V. V. DUBATOLOV / 26.V.1990]; b – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of village Erzin, 17.VI.1963 (N. A. VILOVITSH leg.); c – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of Erzin, 19.VI.1963 (N. A. VILOVITSH leg.); d – ♂: Tuva, Ubsu-Nur hollow, village Erzin vicinity, left side of the Erzin River floodland, 12.VII.2000 (O. KOSTERIN, N. PRIIDAK leg.); e – ♀: Tuva, Ubsu-Nur hollow, village Erzin vicinity, the river Erzin River left side floodland, 16.VII.2000 (N. PRIIDAK leg.); f – ♀: C Tuva, Kaa-Khem District, right side of the Kaa-Khem River floodland, 15 km E of village Kaa-Khem, 30 km E of Kyzyl, 29.VII.2000 (O. E. KOSTERIN, N. PRIIDAK leg.).

Fig. 2: *Polyommatus icarus* (ROTTEMBURG, 1775) *korshunovi* P. GORBUNOV, 1995; underside. Designation the same as in Fig. 1. a – holotype ♂: [S Tuva / Erzin / river Erzin flood-plain / V. V. DUBATOLOV / 26.V.1990]; b – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of village Erzin, 17.VI.1963 (N. A. VILOVITSH leg.); c – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of Erzin, 19.VI.1963 (N. A. VILOVITSH leg.); d – ♂: Tuva, Ubsu-Nur hollow, village Erzin vicinity, left side of the Erzin River floodland, 12.VII.2000 (O. KOSTERIN, N. PRIIDAK leg.); e – ♀: Tuva, Ubsu-Nur hollow, village Erzin vicinity, the river Erzin River left side floodland, 16.VII.2000 (N. PRIIDAK leg.); f – ♀: C Tuva, Kaa-Khem District, right side of the Kaa-Khem River floodland, 15 km E of village Kaa-Khem, 30 km E of Kyzyl, 29.VII.2000 (O. E. KOSTERIN, N. PRIIDAK leg.).

2d	2e	2f
2a	2b	2c
1d	1e	1f
1a	1b	1c

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Colour plate VIII

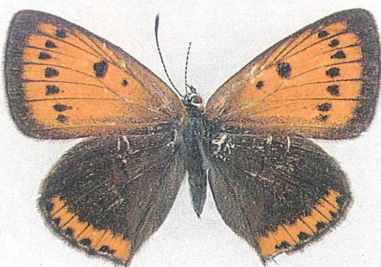
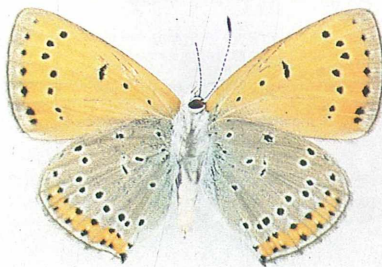
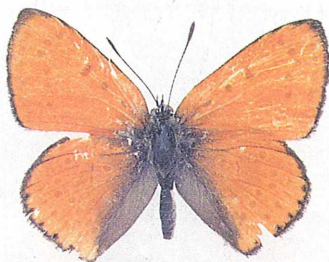
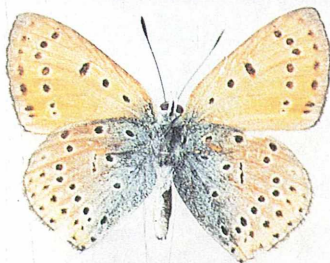
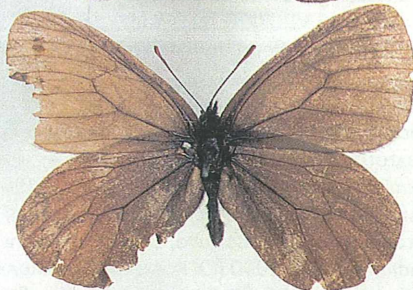
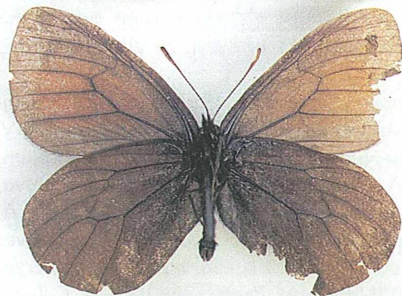
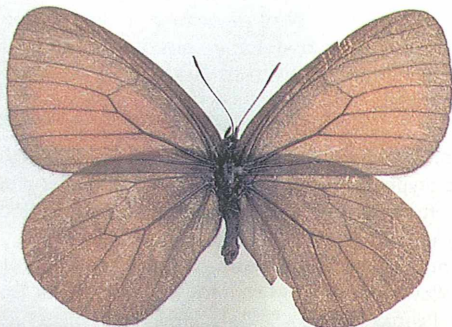
KOSTERIN, O. E.: New records of butterflies for the Tyva Republic [Tuva]. II. Hitherto not reported species and some considerations about the *Erebia magdalena* STRECKER, 1880 and *Polyommatus icarus* (ROTTEMBURG, 1775) groups (Lepidoptera, Diurna). *Atalanta* **33** (1/2): 177–186.

Fig. 1: *Erebia magdalena* STRECKER, 1880 *erynnin* WARREN, 1932. The Saylyg-Khem-Taiga Mt. Range; the Sayanskii Pass, 7.VII.2000: ♀ (above) and ♂ (below), upperside (left) and underside (right).

Fig. 2: *Thersamonolycaena dispar* (HAWORTH, 1803) *aurata* (LEECH, 1897). NW bank of Lake Tere-Khol' 15.VII.2000: ♂ (above) and ♀ (below), underside (left) and upperside (right).



Colour plate VIII



Colour plate IX

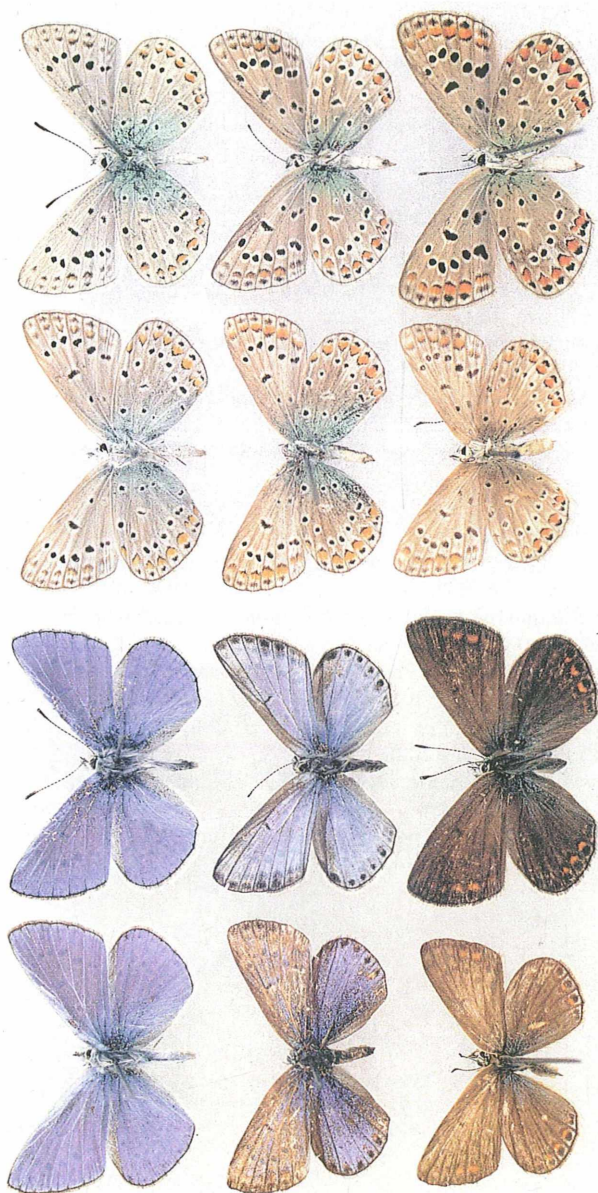
KOSTERIN, O. E.: New records of butterflies for the Tyva Republic [Tuva]. II. Hitherto not reported species and some considerations about the *Erebia magdalena* STRECKER, 1880 and *Polyommatus icarus* (ROTTEMBURG, 1775) groups (Lepidoptera, Diurna). *Atalanta* **33** (1/2): 177–186.

Fig. 1: *Polyommatus icarus* (ROTTEMBURG, 1775) *korshunovi* P. GORBUNOV, 1995; upperside. a holotype ♂: [S Tuva / Erzin / river Erzin flood-plain / V. V. DUBATOLOV / 26.V.1990]; b – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of village Erzin, 17.VI.1963 (N. A. VILOVITSH leg.); c – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of Erzin, 19.VI.1963 (N. A. VILOVITSH leg.); d – ♂: Tuva, Ubsu-Nur hollow, village Erzin vicinity, left side of the Erzin River floodland, 12.VII.2000 (O. KOSTERIN, N. PRIIDAK leg.); e – ♀: Tuva, Ubsu-Nur hollow, village Erzin vicinity, the river Erzin River left side floodland, 16.VII.2000 (N. PRIIDAK leg.); f – ♀: C Tuva, Kaa-Khem District, right side of the Kaa-Khem River floodland, 15 km E of village Kaa-Khem, 30 km E of Kyzyl, 29.VII. 2000 (O. E. KOSTERIN, N. PRIIDAK leg.).

Fig. 2: *Polyommatus icarus* (ROTTEMBURG, 1775) *korshunovi* P. GORBUNOV, 1995; underside. Designation the same as in Fig. 5. a – holotype ♂: [S Tuva / Erzin / river Erzin flood-plain / V. V. DUBATOLOV / 26.V.1990]; b – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of village Erzin, 17.VI.1963 (N. A. VILOVITSH leg.); c – paratype ♀: Tuva, Ubsu-Nur hollow, river Tes-Khem flood-plain, 30 km downstream of Erzin, 19.VI.1963 (N. A. VILOVITSH leg.); d – ♂: Tuva, Ubsu-Nur hollow, village Erzin vicinity, left side of the Erzin River floodland, 12.VII.2000 (O. KOSTERIN, N. PRIIDAK leg.); e – ♀: Tuva, Ubsu-Nur hollow, village Erzin vicinity, the river Erzin River left side floodland, 16.VII.2000 (N. PRIIDAK leg.); f – ♀: C Tuva, Kaa-Khem District, right side of the Kaa-Khem River floodland, 15 km E of village Kaa-Khem, 30 km E of Kyzyl, 29.VII.2000 (O. E. KOSTERIN, N. PRIIDAK leg.).

1a	1d	2d
1b	1e	2e
1c	1f	2f

Colour plate IX



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