

РОССИЙСКАЯ АКАДЕМИЯ НАУК
Южный научный центр

RUSSIAN ACADEMY OF SCIENCES
Southern Scientific Centre

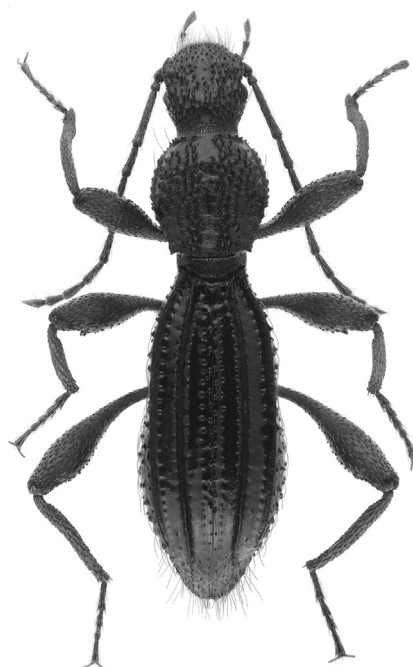


Кавказский Энтомологический Бюллетень

CAUCASIAN ENTOMOLOGICAL BULLETIN

Том 19. Вып. 2

Vol. 19. Iss. 2



Ростов-на-Дону
2023

Data to the knowledge of the Lycaenidae fauna (Lepidoptera) in Afghanistan

© Zs. Bálint¹, A. Karbalaye²

¹Department of Zoology, Hungarian Natural History Museum, Baross utca, 13, Budapest H-1088 Hungary. E-mail: balint.zsolt@nhmus.hu

²Darvazishemran Baharestan str., 140, Tehran IR-1149847113 Iran. E-mail: karbalaye@yahoo.com

Abstract. In total, 63 specimens of Lycaenidae collected in high altitude of the Bamyan Province, Waras District, vicinity of Doabi, a less explored area of Afghanistan from lepidopterological point of view, are evaluated. The material represents seven polyommata (*Afarsia hanna* (Evans, 1932), *Alpherakya bellona* (Grum-Grshimailo, 1888), *A. yakavlangi* (Tshikolovets, Pljusch, Pak et Skrylnik, 2018), *Aricia agestis* ([Schifferrmüller], 1775), *Eumedonia eumedon bamiana* (Tshikolovets, Pljusch et Skrylnik, 2018), *Polyommatus bilucha* (Moore, 1884), *P. icarus* (Rottemburg, 1775)), one scolitantidine (*Turanana laspura* (Evans, 1932)) and one callophrydine (*Satryium hazarajatica* Krupitsky, Pljusch et Pak, 2018) lycaenid butterfly species, all of them are briefly annotated. The species *Polyommatus nadirus* (Moore, 1884) is discussed. These results the following nomenclatural actions and changes: *Eumedonia eumedon bamiana* **comb. n.**; *Polyommatus muetingi* (Bálint, 1993), **sp. reinst.** from the synonymy of *Polyommatus nadira* (Moore, 1865) Tshikolovets, Pljusch et Skrylnik, 2018; lectotype is designated for *Lycaena nadira* Moore, 1884; *Afarsia sieversi nadira* (Moore, 1884), **comb. n.** = *Polyommatus sieversi felicia* Evans 1932, **syn. n.**

Key words: nomenclature, taxonomy, Lycaenidae, Eumaeini, Polyommata, Scolitantidina, Bamyan Province, Afghanistan.

Материалы к познанию фауны Lycaenidae (Lepidoptera) Афганистана

© Ж. Балинт¹, А. Карбалайе²

¹Отделение зоологии, Венгерский музей естественной истории, ул. Барош, 13 Будапешт H-1088 Венгрия. E-mail: balint.zsolt@nhmus.hu

²Ул. Дарвазишмеран Бахаристан, 140, Тегеран IR-1149847113 Иран. E-mail: karbalaye@yahoo.com

Резюме. На больших высотах в провинции Бамиан (район Варас, окрестности Доаби), наименее изученной с лепидоптерологической точки зрения территории Афганистана, собрано 63 экземпляра Lycaenidae: 7 видов из подтрибы Polyommata (*Afarsia hanna* (Evans, 1932), *Alpherakya bellona* (Grum-Grshimailo, 1888), *A. yakavlangi* (Tshikolovets, Pljusch, Pak et Skrylnik, 2018), *Aricia agestis* ([Schifferrmüller], 1775), *Eumedonia eumedon bamiana* (Tshikolovets, Pljusch et Skrylnik, 2018), *Polyommatus bilucha* (Moore, 1884), *P. icarus* (Rottemburg, 1775)), 1 вид из подтрибы Scolitantidina (*Turanana laspura* (Evans, 1932)) и 1 вид из подсемейства Theclinae, подтрибы Callophrydina (*Satryium hazarajatica* Krupitsky, Pljusch et Pak, 2018). Даны замечания по таксономии и распространению каждого таксона. В результате предложены следующие номенклатурные акты: *Eumedonia eumedon bamiana* **comb. n.**; *Polyommatus muetingi* (Bálint, 1993), **sp. reinst.** восстановлен из младших синонимов *Polyommatus nadira* (Moore, 1865) Tshikolovets, Pljusch et Skrylnik, 2018; обозначен лектотип для *Lycaena nadira* Moore, 1884; *Afarsia sieversi nadira* (Moore, 1884), **comb. n.** = *Polyommatus sieversi felicia* Evans 1932, **syn. n.**

Ключевые слова: номенклатура, таксономия, Lycaenidae, Eumaeini, Polyommata, Scolitantidina, Бамиан, Афганистан.

Introduction

Afghanistan is a country difficult to access. Nevertheless the butterfly fauna there is not the least known in the Palaearctic region. This is due to two splendid monographs authored by the Japanese [Sakai, 1981], and most recently by a team of Ukrainian lepidopterists [Tshikolovets et al., 2018]. These monographs showed how special the butterfly fauna of Afghanistan is, so of course the research continued despite the difficulties [Krupitsky et al., 2018, 2021, 2022].

The second author spent two summer months of 2021 in Afghanistan for exploring the Lepidoptera fauna. Present paper reports on the samples originating from the Bamyan Province, the vicinity of Doabi village, Waras District (33.98568°N / 66.65215°E) (Fig. 1), where an interesting Lycaenidae material has been harvested in the period of July 1–10 at elevation of 3300–3400 meters (Figs 2–4).

Species discussed are listed in alphabetical order according to subfamily, tribal, subtribal, generic and species-group names. The species recorded are fully

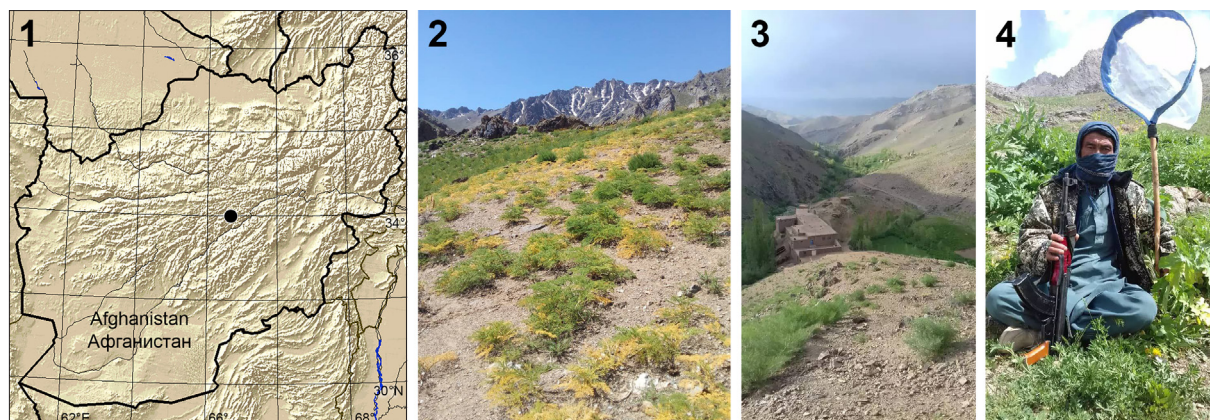
referred as appearing in the monographs of Sakai [1981] and Tshikolovets et al. [2018]. The amount of material is given for each species, which have been examined and are preserved in the Hungarian Natural History Museum (HNHM, Budapest, Hungary). Dissections were prepared when they are turned to be necessary as outlined in [Higgins, 1975]. Remarks are given for each taxon discussing nomenclatural or taxonomic questions.

Subfamily Polyommatae
Tribe Polyommata Swainson, 1827
Subtribe Polyommata Swainson, 1827
Afarsia hanna (Evans, 1932)
 (Figs 5, 6)

Vacciniina iris hanna Evans: Sakai, 1981: 127, pl. 43, figs 12–13, 15; D'Abrera, 1993: 492, figs "V. iris hanna, ♂R" (designated as lectotype by Bálint [1999: 34]), "V. iris hanna, ♂V" (paralectotype).

Plebejus hanna (Evans, 1932): Tshikolovets et al., 2018: 138, pl. 24, figs 21–24.

Material. 2♂.



Figs 1–4. Geographical origin of the material and its collector.

1 – collection site; 2–3 – the locality above the Doabi village: 2 – habitat, view northwards to the mountain ridge over 3300 m, 3 – habitat, view southwards from the collecting site down to the valley; 4 – equipped local lepidopterist above Doabi village.

Рис. 1–4. Географическое происхождение исследованного материала и его сборщик.

1 – место сбора; 2–3 – местонахождение выше села Доаби: 2 – биотоп, вид на север, на горный хребет высотой более 3300 м, 3 – биотоп, вид на юг с места сбора вниз на долину; 4 – экипированный местный лепидоптеролог выше села Доаби.

Notes. The genus *Afarsia* Korb et Bolshakov, 2011 (replacement name of *Farsia* Zhdanko, 1992 (nec *Farsia* Amsel, 1961, Pyralidae) with the type species “*Lycaena hircana* Lederer, 1869” (misidentification) by original designation = *Lycaena sieversi* Christoph, 1873), was recognized subsequently and the species was placed there [Tuzov et al., 2000; Talavera et al., 2012]. Less known species, identification is problematic. The relatively large size, dorsal wing surface with no bronze shine with a large discoidal spot and the dark ventral wing surfaces could help to associate the specimens with the type material illustrated [D’Abrera, 1993]. It is remarked that the distributional records available in the literature for the species need caution, because of the large similarity of the congeneric taxa identifications could be erroneous [Tshikolovets et al., 2018].

Alpherakya bellona (Grum-Grshimailo, 1888)
(Figs 7, 8)

Polyommatus devanica Moore, 1874 (!): Sakai, 1981: 236, pl. 44, figs 38–50.

Polyommatus bellona Grum-Grshimailo, 1888: D’Abrera, 1993: 505, figs “*P. Bellona* ♂R” and “*P. Bellona* ♂V” (lectotype designated by Bálint [1999: 19]).

Polyommatus devanicus bellonus (Grum-Grshimailo, 1888): Tshikolovets et al., 2018: 148, pl. 29, figs 24–26.

Polyommatus devanicus kohibabaensis Sakai, 1981: Tshikolovets et al., 2018: 148, pl. 29, figs 13–16.

Polyommatus devanicus tshikolovetsi Bálint, 1999: Tshikolovets et al., 2018: 148, pl. 29, figs 17–20.

Alpherakya bellona (Grum-Grshimailo, 1881): Bálint, 2022: 76.

Material. 6♂, 3♀.

Notes. The taxa *A. bellona* and *A. devanica* were distinguished on species level, and placed the nominal taxa *kohibabaensis* and *tshikolovetsi* under the former species as junior synonyms [Bálint, 2022]. The species *A. bellona* was not yet recorded in the Waras District, which is actually the most southwestern record of the species.

Alpherakya yakavlangi
(Tshikolovets, Pljushtch, Pak et Skrylnik, 2018)
(Figs 9, 10)

Polyommatus sartus yakavlangi Tshikolovets, Pljushtch, Pak et Skrylnik, 2018: Tshikolovets et al., 2018: 147, pl. 29, figs 34–36.

Alpherakya yakavlangi (Tshikolovets, Pljushtch, Pak et Skrylnik, 2018): Bálint, 2022: 81.

Material. 2♂, 1♀.

Notes. The genus *Alpherakya* Zhdanko, [1996] (type species *Lycaena sarta* Alpheraky, 1881, by original designation) was recognized [Tuzov et al., 2000; Talavera et al., 2012]. The nominal taxon *Polyommatus sartus yakavlangi* has been described as a subspecies of *Alpherakya sarta* (Alphéraky, 1881) on the basis of the male holotype and six paratypes (four males, and two females) all collected in “Baimyan prov., Yakawlang distr., Kotsak vill. Circ. 2800” in the beginning of July. It was noted that the taxon morphologically is indeed closer to *A. sarta* than to *A. rupala* (Evans, 1925), but on the basis of genitalia and wing traits, and the perfect isolation of the taxa *A. sarta* and *A. yakavlangi*, they were considered as distinct species [Bálint, 2022]. The record published here provides new data for geographical and altitudinal occurrences: it is somewhat 100 km more south and in 400–500 m higher than the type locality.

Aricia agestis ([Schiffermüller], 1775)
(Figs 11, 12)

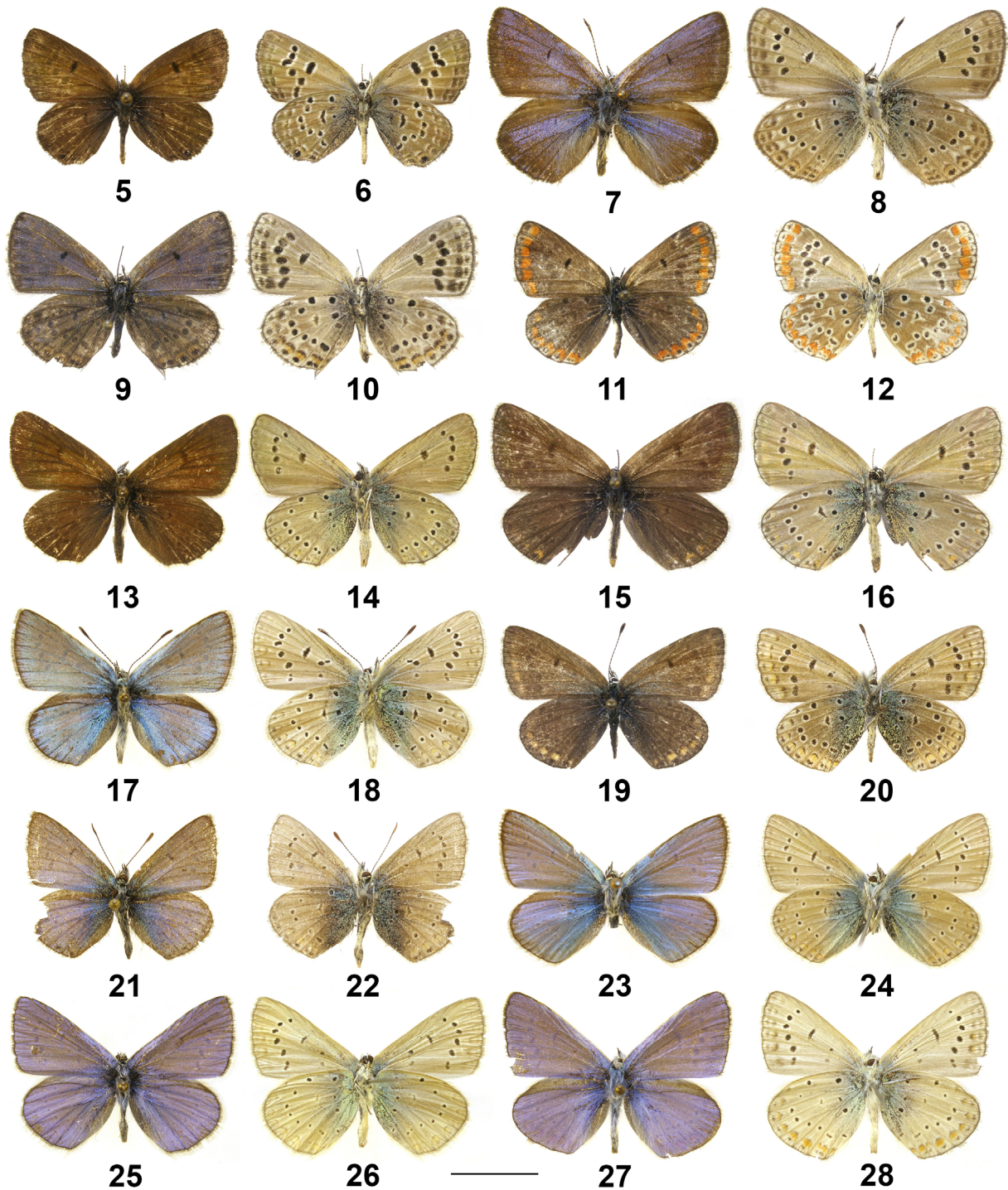
Aricia agestis nazira (Moore, 1865): Sakai, 1981: 126, pl. 42, figs 19–23.

Plebejus agestis agestis ([Denis & Schiffermüller], 1775): Tshikolovets et al., 2018: 140, pl. 24, figs 29–31, 36.

Plebejus agestis nazira (Moore, 1865): Tshikolovets et al., 2018: 140, pl. 24, figs 24, 33–35.

Material. 1♀.

Notes. The genus *Aricia* [Reichenbach], 1817 (type species *Papilio agestis* [Schiffermüller], 1775, by subsequent designation of Tutt [1906]) was recognized [Tuzov et al., 2000; Talavera et al., 2012]. *Aricia agestis* is a species

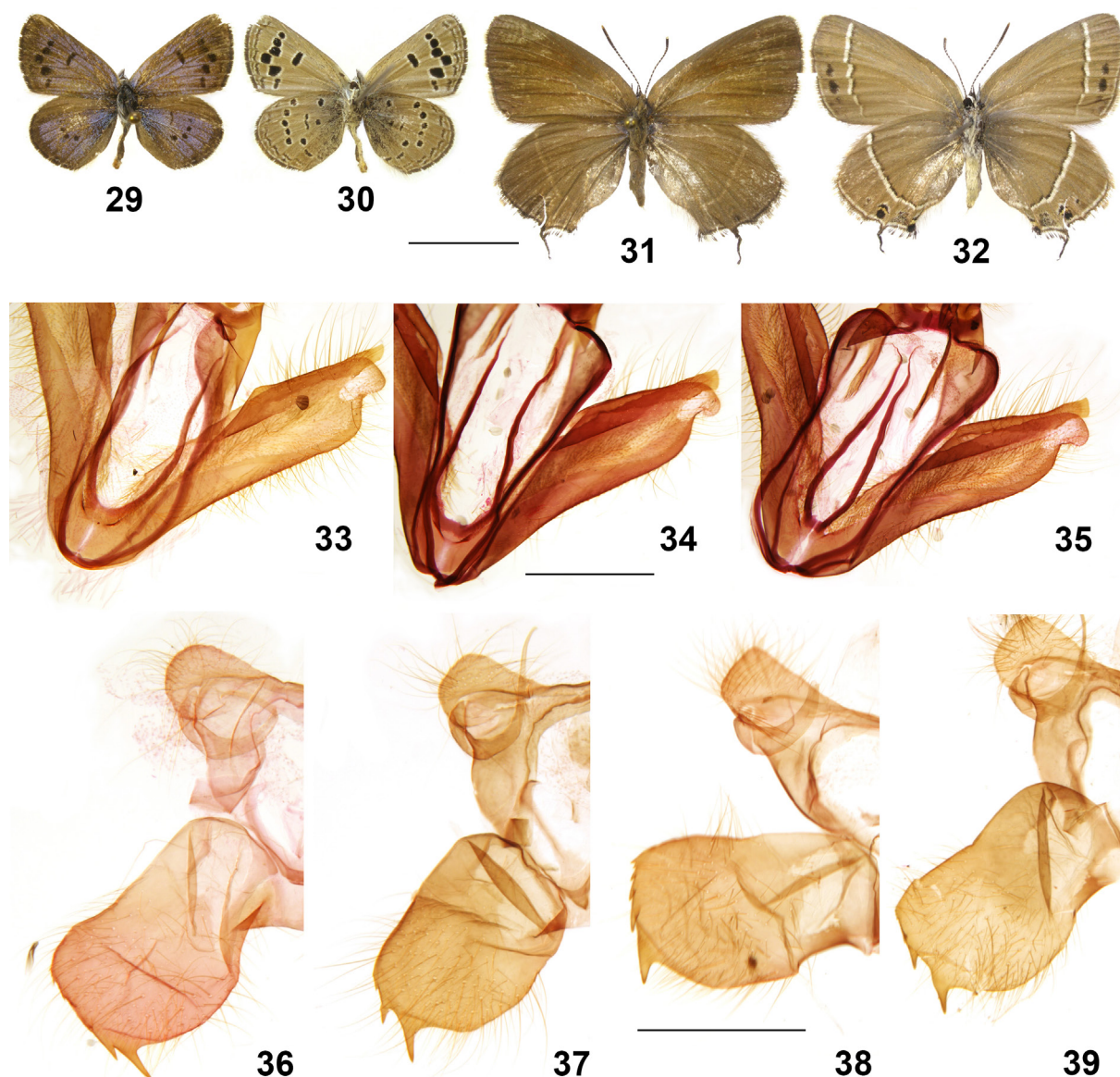


Figs 5–28. Lycaenidae species from Afghanistan.

5–6 – *Afarsia hanna*, male (Doabi village); 7–8 – *Alpherakya bellona*, male (Doabi village); 9–10 – *Alpherakya yakavlangi*, male (Doabi); 11–12 – *Aricia agestis*, female (Doabi village); 13–16 – *Eumedonia eumedon bamiana* (Doabi village): 13–14 – male, 15–16 – female; 17–20 – *Polyommatus bilucha* (Doabi village): 17–18 – male, 19–20 – female; 21–24 – *Polyommatus muetingi*: 21–22 – male, holotype (Kabul), 23–24 – male (Salang Pass); 25–28 – *Polyommatus icarus*, males (Doabi village): 25–26 – specimen with darker ventral wing surface colouration and vestigial pattern, 27–28 – specimen with lighter ventral wing surface colouration and more developed pattern. Odd-numbered figures – dorsal view, even-numbered figures – ventral view. Scale bar 1 cm. Photographs and composition by G. Katona.

Рис. 5–28. Виды семейства Лусенаиде из Афганистана.

5–6 – *Afarsia hanna*, самец (село Доаби); 7–8 – *Alpherakya bellona*, самец (село Доаби); 9–10 – *Alpherakya yakavlangi*, самец (село Доаби); 11–12 – *Aricia agestis*, самка (село Доаби); 13–16 – *Eumedonia eumedon bamiana* (село Доаби): 13–14 – самец, 15–16 – самка; 17–20 – *Polyommatus bilucha* (село Доаби): 17–18 – самец, 19–20 – самка; 21–24 – *Polyommatus muetingi*: 21–22 – самец, голотип (Кабул), 23–24 – самец (перевал Саланг); 25–28 – *Polyommatus icarus*, самцы (село Доаби): 25–26 – экземпляр с более темной окраской вентральной поверхности крыла и рудиментарным рисунком, 27–28 – экземпляр с более светлой окраской вентральной поверхности крыла и более развитым рисунком. Рисунки с нечетной нумерацией – вид сверху, рисунки с четной нумерацией – вид снизу. Масштабная линейка 1 см. Фотографии и составление Г. Катона.



Figs 29–39. Lycaenidae species and male genitalia.

29–30 – *Turanana laspura*, male (Doabi village, Afghanistan): 29 – dorsal view, 30 – ventral view; 31–32 – *Satyrium hazarajatica*, male (Doabi village, Afghanistan): 31 – dorsal view, 32 – ventral view; 33–35 – male genitalia of *Eumedonia eumedon* mounted on microscopic slides showing the anterior part with vinculum and in full one of the valvae: 33 – *E. e. eumedon* (Austria), 34–35 – *E. e. bamiana* (Afghanistan); 36–39 – male genitalia of *Turanana laspura* mounted on microscopic slides showing one part of the symmetric organ: 36 – specimen from “Turkestan”, 37 – specimen from Khorog, Tajikistan, 38–39 – specimens from Doabi village, Afghanistan. Scale bars: 29–32 – 1 cm; 33–35 – 2 mm; 36–39 – 1.1 mm. Photographs 29–32 by G. Katona, 33–39 by Zs. Bálint; composition by G. Katona.

Рис. 29–39. Виды семейства Lycaenidae и гениталии самцов.

29–30 – *Turanana laspura*, самец (село Доаби, Афганистан): 29 – вид сверху, 30 – вид снизу; 31–32 – *Satyrium hazarajatica*, самец (село Доаби, Афганистан): 31 – вид сверху, 32 – вид снизу; 33–35 – гениталии самцов *Eumedonia eumedon* на предметных стеклах, передняя часть с винкулюмом и одна из вальв полностью: 33 – *E. e. eumedon* (Австрия), 34–35 – *E. e. bamiana* (Афганистан); 36–39 – гениталии самцов *Turanana laspura* на предметных стеклах, показывающие часть симметричного органа: 36 – экземпляр из “Turkestan”, 37 – экземпляр из Хорога, Таджикистан, 38–39 – экземпляр из села Доаби, Афганистан. Масштабные линейки: 29–32 – 1 см; 33–35 – 2 мм; 36–39 – 1.1 мм. Авторы фотографий: 29–32 – Г. Катона, 33–39 – Ж. Балинт; составление Г. Катона.

described from the Vienna region (Austria) as *Papilio agestis* in an influential book of lepidopterology [Bálint, 2023]. It has a wide distribution from British Isles, from the Atlantic coast of Europe, via the Russian-Ukrainian steppes to Kazakhstan and Mongolia. *Aricia agestis* is a forest-steppe species which has been adapted to habitats of anthropogenic influences. In the Mediterranean region

A. agestis occurs together with its sister species *A. cramera* (Eschscholtz, 1821), what primarily may be distinguished by the more extensive orange colouration of the wing surfaces and some genitalia traits [Higgins, 1975].

For the Afghani populations, the species-group names *agestis* and *nazira* have been applied. The description of *Polyommatus nazira* Moore, 1865 was based on the

material of unstated number of specimen(s) with unstated sex collected in Kunawur (= Kinnaur, India). The lectotype has been designated on the basis of a syntypic male and the nominal taxon was considered as a subjective synonym of *Aricia agestis* [Bálint, 1999]. The lectotype matches perfectly with the male phenotype of the first brood of *A. agestis*, therefore there is no ground to apply the name suggesting that it represents a distinct population restricted to the provinces Baghlan, Kabul, Panjshir, Parwan and Wardak. The Waras record is the most southern known occurrence of the species in Afghanistan, and has a remarkable submarginal pattern formed by vivid orange lunules, somewhat reminiscent to *A. cramera*. Further studies are necessary to evaluate whether it is an aberrant individual or there is a *cramera*-like taxon which needs to be named.

Eumedonia eumedon bamiana
(Tshikolovets, Pljushtch, Pak et Skrylnik, 2018), **comb. n.**
(Figs 13–16, 34, 35)

Plebejus eumedon bamianus Tshikolovets, Pljushtch, Pak et Skrylnik, 2018: Tshikolovets et al., 2018: 139, pl. 23, figs 38–40.

Material. 4♂, 1♀ (HNHM, Tóth numbers 2185, 2186).

Notes. The genus *Eumedonia* Forster, 1938 (type species *Papilio eumedon* Esper, 1780, by original designation) was recognized [Tuzov et al., 2000; Talavera et al., 2012]. The species *Eumedonia eumedon* has been described from the vicinity of Erlangen (Germany) and has a wide distribution in the Palaearctic region from Europe, via the Russian-Ukrainian steppes and Siberia to the Pacific coast. It is a forest-steppe polyommata lycaenid specialized to Geranium inhabiting mesophilous meadows and marshlands, and has two ecotypes (cf. Eitschberger, Steiniger [1975]).

In the HNHM there are 530 specimens of *E. eumedon* representing the entire range of the species. On the basis of this material the taxon *E. eumedon bamiana* seems to be indeed unique. By the authors [Tshikolovets et al., 2018: 139] a good diagnosis is presented listing several characters, as: 1) “complete absence of white stripe on hindwing underside”; 2) “very weakly developed orange submarginal spots on hindwing, and especially on forewing on which they are obsolescent”; 3) “on hindwing these orange elements are very small and more widely separated” mentioning that “in all other subspecies they are significantly bigger and brighter; and finally, 4) “the black lunules edging submarginal spots are very weak and vestigial”. Character 1 is remarkable as in all known *E. eumedon* populations in the Himalaya region possess the white stripe (HNHM vouchers; [Tshikolovets, Pagés, 2016]). However in populations from Europe, Russia and Mongolia this character is not exclusive, as phenotypes with and without white stripe occur in the same location (HNHM vouchers; [Tshikolovets et al., 2009]). Characters 2–4 are especially obvious in the Doabi material, as in all the specimens these elements of the wing ventral surfaces are indeed vestigial.

In general, Polyommata male genitalia often provide good quantitative, sometimes qualitative characters for species discrimination. The male genitalia of *E. eumedon* is well documented [Higgins, 1975; Fernández-Rubio, 1976; Nekrutenko, 1985; Jakšič, 1998]. The Doabi specimens

have typical *Eumedonia* male genitalia with a developed membranous inner lobe and wider rounded apex, whilst the outer part is sclerotized with an angular terminus (Figs 33–35).

We presume that the lack of the white stripe associated with strongly reduced submarginal pattern with the genitalia trait mentioned are genetically coded characters and reflect a different biological species of *Eumedonia* which is distributed in the Bamyan Province. However this observation needs further supporting evidences. The record published here provides new data for geographical occurrence: it is somewhat 100 km south of the type locality.

Polyommatus bilucha (Moore, 1884)
(Figs 17–20)

Polyommatus eros bilucha (Moore, 1884): Sakai, 1981: 128, pl. 43, fig. 55.

Polyommatus bilucha (Moore, 1884): Tshikolovets et al., 2018: 154, pl. 28, figs 1–6.

Material. 20♂, 7♀.

Notes. Most of the specimens documented as *P. eros bilucha* actually represent different taxa [Sakai, 1981; Tshikolovets et al., 2018], and with *P. icadius* (Grum-Grshimailo, 1890) it forms a sister-clade of *P. icarus* (Rottemburg, 1775) [Vodolazhsky et al., 2011]. The species is relatively small with the forewing costa length in males 13–16 mm and in females 12–16 mm. Male dorsal wing surfaces are gleaming silvery blue (“brilliant, glossy, opalised, lilacine cobalt-blue” [Moore, 1884: 24]) with delicate forewing discoidal line, females are brown with slight blue basal suffusion, pale orange submarginal lunules, and well visible forewing discoidal spot. Ventral wing surfaces are highly *icarus*-reminiscent with forewing discal spot and basal suffusion of gleaming green scales. The intensity of the ventral wing surface markings is variable.

The taxon *Lycaena bilucha* has been described by Moore in 1884 on the basis of an unstated number of male specimens from “Chaman, S. Beluchistan (April)”, deposited “In coll. Ind. Mus., Calcuta” (National Zoological Museum, Kolkata). The lectotype was designated on the basis of a male from “Chaman, 5. 80” deposited in the Natural History Museum (NHMUK, London, UK) [Bálint, 1999]. A further male syntype has been pictured, what is now a paralectotype [Sheela et al., 2019]. We remark that the month of collecting indicated by the labels of these formerly syntype specimens does not match with the original description. We have the opinion that the type material consisted several specimens collected in various months, and the collecting time was not precisely registered by Moore. It is well known that the Lepidoptera material of Frederick Moore (1830–1907), containing syntypes of taxa he collected and described in the subcontinent India, landed chiefly in the NHMUK [Horn et al., 1990]).

Polyommatus muetingi (Bálint, 1993), **sp. reinst.**
(Figs 21–24)

Polyommatus eros bilucha Moore, 1884: Sakai, 1981: 233, pl. 43, figs 48–54.

Polyommatus nadirus (Moore, 1884): Tshikolovets et al., 2018: 154, pl. 26, figs 49–54.

Material. 3♂, 1♀ (type material of *Agrodiaetus muetingi*; see [Bálint, 1993]), male (“Salang pass”).

Notes. The sympatric and congeneric Afghanistani species documented under the name *Polyommatus nadirus* [Tshikolovets et al., 2018] is somewhat similar to *P. bilucha* discussed above, but has a somewhat longer forewing outer margin resulting a more pointed apex, male dorsal forewing ground colour is gleaming sky blue and the ventral wing surface basal suffusion is also blue in both sexes. As the name *Lycaena nadira* Moore, 1884 represents an other species as we outline below, the valid name for this species is *Polyommatus muetingi* (Bálint, 1993), **sp. reinst.**, as according to our best knowledge this is the senior name available for the species.

The name *Lycaena nadira* was proposed on the basis of an unstated number of female specimens collected at Kabul, deposited in the “Indian Museum, Calcutta” [Moore, 1884]. One of the females (syntype) has been documented under the type registration number No. 3573/1 [Sheela et al., 2019: 147]. This specimen is hereby designated here as the lectotype of *Lycaena nadira* to objectively fix the name. The specimen represents the taxon documented as *Plebejus sieversi felicia* (Evans, 1932) [Tshikolovets et al., 2018]. The species *Lycaena sieversi* Christoph, 1877 and its related taxa have been placed in the genus *Afarsia* (Talavera et al., 2012), what results *Afarsia sieversi nadira* (Moore, 1884), **comb. n.** and *Lycaena nadira* Moore, 1884 = *Polyommatus sieversi felicia* Evans, 1932, **syn. n.**

Polyommatus icarus (Rottemburg, 1775)
(Figs 25–28)

Polyommatus icarus fugitiva Butler, 1881: Sakai, 1981: 127, 233, pl. 43, figs 29–32, 35–47.

Polyommatus icarus fugitivus (Butler, 1881): Tshikolovets et al., 2018: 149, pl. 27, figs 1–8, 10–12.

Material. 8♂, 1♀.

Notes. The difficulty what corroborates the taxonomy of Afghanistani *P. icarus* populations has been remarked, that because of their phenotypic plasticity there, it is difficult to apply the available names [Tshikolovets et al., 2018]. Seven male specimens of the examined material have no orange pattern in the submarginal area and have extensive blue basal suffusion in the hindwing ventral surface. They match with the specimens from the Joshanak Valley illustrated as figures 6 (male) and 8 (female) documented in the literature [Tshikolovets et al., 2018]. One of the males is identical with the specimen from Panjaw illustrated as figure 40 in another book [Sakai, 1981]. These specimens, including the ones from Doabi, are most reminiscent to the Central Asian *P. icarus*-like phenotype documented as *Polyommatus kashgarensis* Moore, 1890 [Tuzov et al., 2000].

The cold-shock experiments on *P. icarus* revealed that the most stable wing pattern elements of the ventral wing surface are the submarginal orange lunules and the blue suffusion of the scales in the basal area, whilst the black spots are highly sensitive [Kertész et al., 2017; Piszter et al., 2019, 2023], resulting some polyommatine phenotypes known to occur in extremely high altitudes [Bálint, 1995]. In drier and warmer climatic conditions *P. icarus* does not show these remarkable alterations but display variations

of the orange lunulation, the basal blue suffusion, and a versatility of ventral wing surface ground colour with tendency for whitening [Artemyeva, 2005, 2007]. It is important to breed *P. icarus* under warm-shock experiment and analyse the results.

Subtribe Scolitantidina Tutt, 1907

Turanana laspura (Evans, 1932)

(Figs 29, 30, 38, 39)

Turanana cytis laspura (Evans, 1932): Sakai, 1981: 229, pl. 42, figs 35–37, 41–44.

Turanana laspura laspura (Evans, 1932): Tshikolovets et al., 2018: 123, pl. 25, figs 31–36.

Material. 5♂, 1♀ (HNHM, genitalia preparation Tóth numbers 2179, 2180).

Notes. The nomenclature and the taxonomy of the genus *Turanana* Bethune-Baker, 1916 (type species: *Lycaena cytis* Christoph, 1877, by original designation) inhabiting the Central Asian mountain systems is complex. Besides the five monotypic brown species three further species have been recorded which have dorsally blue males [Tshikolovets et al., 2018]. The largest one amongst them is documented under the species-group name “*laspura*”, described as *Polyommatus cytis laspura* on the basis of an unstated number of male and female specimens from “Chitral” having pale lavender blue male upperside forewing with “3 discal spots in addition to the spot end cell” (= three additional postmedian spots to the discoidal spot) [Evans, 1932: 227]. The *laspura* phenotype has been documented as figures 35–36 (“Mt. Khwajaghar” and “Bala-Kuran”, respectively) in Sakai [1981] and as figure 32 (“Anjuman valley”) in Tshikolovets et al. [2018].

The Bamyān male forewing dorsal surfaces are dark violet blue and patterned by five-six black postmedian spots. The hindwing dorsal surface has also postmedian spots what supposedly lack on *laspura* syntypes as this trait is not mentioned in the original description. This phenotype has been documented as figure 41 (“Korpetaw”) in Sakai [1981]. In Scolitantidina, the dorsal wing surface pattern composed using black melanin pigment can be highly variable intraspecifically. For example, in *Maculina arion* (Linnaeus, 1758), there are individuals of the same population having dorsal wing surfaces without pattern or individuals with postmedian region heavily black spotted (HNHM vouchers). The origin of this phenotypic plasticity is not yet known, but the key factor is provided during the time spent in the ant hill in larval or pupal stage.

The scolitantidine male genitalia often display diagnostic characters [Higgins, 1975; Coutsis, 2004, 2005, 2006]. Beside two Bamyān specimens, one male from “Turkestan” (HNHM, Tóth no. 2181) and one male from “Chorog” (HNHM, Tóth no. 2182) (Figs 36, 37) have been examined and dissected. The Turkestanian and the Pamirian specimens have no hindwing dorsal surface pattern, the wings are pure blue. We could not find any characteristic trait what could support to discriminate the phenotypes with or without hindwing dorsal surface pattern, and three versus five-six forewing postmedian spots: the valval shape of all the investigated specimens is wide, rectangle-shaped and the costa terminal part after

the angle is serrated (Figs 35–38). The valval shape and the degree of costal dentation are probably variable as indicated by the figure 45 of Zhdanko [2000].

Subfamily Theclinae Swainson, 1827

Tribe Eumaeini Doubleday, 1847

Subtribe Callophryidina Tutt, 1907

Satyrrium hazarajatica Krupitsky, Pljusch et Pak, 2018
(Fig. 31, 32)

Satyrrium skrylniki Krupitsky, Pljusch et Pak, 2015: Tshikolovets et al., 2018: 103, pl. 20, figs 25–28 (misidentification).

Satyrrium hazarajatica Krupitsky, Pljusch et Pak, 2018: Krupitsky et al., 2018: 263, pl. 1, fig 2, pl. 2, fig. 1, pl. 3, fig. 1.

Material. 1♂.

Notes. This is a poorly known species, belonging to the *Satyrrium deria* (Moore, 1865) species-group, representing to the close relatives of *Satyrrium sassanides* (Kollar, [1849]) (type species of *Superflua* Strand, 1910) [Krupitsky et al., 2015; 2018]. The identification is based on differential characters given by the original description [Krupitsky et al., 2018: 263]: “*S. (S.) hazarajatica* sp. n. can be differentiated from other members of the *S. (S.) deria* species group by larger size, pale fringe on hindwing, pale underside of wings, and postdiscal band with reduced dark suffusion (fringe dirty or brownish white; underside of wings darkened; postdiscal band underlain by dark line in all three closely related species)”. However the Central Asian *S. deria* and *S. skrylniki* cannot be distinguished on the basis of these quantitative characters (see the figure *S. sassanides deria* in D’Abrera [1993] and figures in Tshikolovets et al. [2018]). Further investigations are necessary to check statistically whether the characters used here to identify the taxon are indeed diagnostic and the possible synonymy of *S. deria* and *S. skrylniki* can be excluded. The record published here provides new data for geographical and altitudinal occurrences: it is somewhat 100 km more south and in elevation it is 600 m higher than the type locality.

Acknowledgements

Thanks are due the Gergely Katona and Balázs Tóth (both from HNHN) for their various helps during the preparation of the manuscript. We express our thanks to the reviewers for their critical and constructive comments.

References

- Artemyeva E.A. 2005. Clinal variation in populations of the common blue butterfly *Polyommatus icarus* Rott. (Lepidoptera, Lycaenidae). *Russian Journal of Genetics*. 41(8): 859–870. DOI: 10.1007/s11177-005-0173-y
- Artemyeva E.A. 2007. Phenotypic diversity in populations of the common blue butterfly *Polyommatus icarus* Rott. as a trend in the ecenotic strategy of the species. *Russian Journal of Ecology*. 38(1): 58–67. DOI: 10.1134/S1067413607010109
- Bálint Zs. 1993. Faunistic data of Lycaenid butterflies from the Himalayan Region (Lepidoptera, Lycaenidae). *Linneana Belgica*. 13(8): 395–422.
- Bálint Zs. 1995. Two new *Polyommatus* species from the Himalayan region (Lepidoptera, Lycaenidae, Polyommataini). *Annales Historico-Naturales Musei Nationalis Hungarici*. 87: 93–102.
- Bálint Zs. 1999. Annotated list of type specimens of *Polyommatus* Section sensu Eliot of the Natural History Museum, London (Lepidoptera, Lycaenidae, Polyommataini). *Neue entomologische Nachrichten*. 40: 1–68, 23 figs, 4 pls.
- Bálint Zs. 2022. Guide to the Butterflies of the Palearctic Region. Lycaenidae Part V, Subfamily Polyommatainae, Tribe Polyommataini (partim). Milano: Omnes Artes. 106 p.
- Bálint Zs. 2023. Schiffermüller and the Jesuit lepidopterists of the 18th century: Further notes on the “Wiener Systematisches Verzeichniss”. *Lepidoptera Novae*. 16(2): 115–126.
- Coutsis G.J. 2004. Revision of the *Turanana endymion* species-group (Lycaenidae). *Nota Lepidopterologica*. 27(4): 251–272.
- Coutsis G.J. 2005. Revision of the *Turanana endymion* species-group (Lycaenidae). *Nota Lepidopterologica*. 28(3/4): 202.
- Coutsis G.J. 2006. Additional revisionary actions and corrections in the *Turanana endymion* species-group (Lepidoptera). *Nota Lepidopterologica*. 29(1/2): 17–25.
- D’Abrera B. 1993. Butterflies of the Holarctic Region. Part III, Nymphalidae (concl.), Libytheidae, Riodinidae & Lycaenidae. Victoria: Hill House. i–vii + 335–524.
- Eitschberger U., Steiniger H. 1975. Die geographische variation von *Eumedonia eumedon* (Esper, 1780) in der Westlichen Palaearktis (Lep. Lycaenidae). *Atalanta*. 6(2): 84–125.
- Evans W.H. 1932. The identification of Indian butterflies. Madras: Bombay Natural History Society. xii + 302 p., 32 pls, 11 figs.
- Fernández-Rubio F. 1976. Genitalias (Andropigios) de los Ropalóceros de Alava y su entorno ibérico. Part I: Lycaenidae. Vitoria: Diputacion Foral de Alava, Seccion de Ciencias. [2 + 4] p., 71 pls.
- Higgins L.G. 1975. The classification of European butterflies. London: Collins. 320 p.
- Horn W., Kahle I., Friese G., Gaedike R. 1990. Collectiones entomologicae. Eine Kompendium über den Verbleib entomologischer Sammlungen der Welt bis 1960. 1–2 Bände. Berlin: Akademie der Landwirtschaftswissenschaften der Deutschen Demokratischen Republik. 573 p.
- Jakšić N.P. 1998. Male genitalia of butterflies on Balkan Peninsula with a check-list. Lepidoptera: Hesperioidea and Papilionoidea. Bratislava: František Slamka. 144 p.
- Kertész K., Piszter G., Horváth Zs.E., Bálint Zs., Biró L.P. 2017. Changes in structural and pigmentary colours in response to cold stress in *Polyommatus icarus* butterflies. *Scientific Reports*. 7(1): 1118. DOI: 10.1038/s41598-017-01273-7
- Krupitsky A.V., Pljusch I.G., Pak O.V. 2015. Taxonomic notes on the genus *Satyrrium* Scudder, 1876 (Lepidoptera, Lycaenidae) of Afghanistan with description of two new taxa. *Zootaxa*. 3985(3): 421–431. DOI: 10.11646/zootaxa.3985.3.6
- Krupitsky A.V., Pljusch I.G., Pak O.V. 2018. Systematics of the *Satyrrium (Superflua) deria* (Moore, 1865) species group with description of a new species from Afghanistan (Lepidoptera, Lycaenidae). *Zootaxa*. 4399(2): 261–271. DOI: 10.11646/zootaxa.4399.2.9
- Krupitsky A., Pljusch I., Skrylnik Yu. 2021. A new species of the *Plebejus samudra* (Moore, 1874) (Lycaenidae: Polyommatainae) group from Afghanistan. *Zoology in the Middle East*. 67(2): 1–7. DOI: 10.1080/09397140.2021.1883643
- Krupitsky A., Skrylnik Yu., Pak O. 2022. A new species of the *Callophrys rubi* (Linnaeus, 1758) group from Afghanistan (Lepidoptera, Lycaenidae). *Zoology in the Middle East*. 68(4): 332–340. DOI: 10.1080/09397140.2022.2145798
- Moore F. 1884. Descriptions of some new Asiatic diurnal Lepidoptera; chiefly from specimens contained in the Indian Museum, Calcutta. *Journal of the Asiatic Society of Bengal*. 53, part 2(1): 16–52.
- Nekrutenko Yu.P. 1985. Bulavousye cheshuekrylye Kryma. Opredelitel’ [Papilionoformes of Crimea. A key]. Kiev: Naukova Dumka. 152 p., 24 pls. (in Russian).
- Piszter G., Bálint Zs., Kertész K., Szatmári L., Sramkó G., Biró L.P. 2023. Breeding *Polyommatus icarus* serves as a large-scale and environmentally friendly source of precisely tuned photonic nanoarchitectures. *Insects*. 14(716): 1–14. DOI: 10.3390/insects14080716
- Piszter G., Kertész K., Horváth Zs.E., Bálint Zs., Biró L.P. 2019. Reproducible phenotype alteration due to prolonged cooling of the pupae of *Polyommatus icarus* butterflies. *PLoS ONE*. 14(11): e0225388. DOI: 10.1371/journal.pone.0225388
- Sakai S. 1981. Butterflies of Afghanistan. Tokyo: Kodansha. 272 p., 48 pls. (in Japanese).
- Sheela S., Das D., Shah S.K., Chandra K. 2019. The type specimens in the National Zoological Collection. Lepidoptera. Kolkata: Zoological Survey of India. 342 p.
- Talavera G., Lukhtanov V.A., Pierce N.E., Vila R. 2012. Establishing criteria for higher-level classification using molecular data: the systematics of *Polyommatus* blue butterflies (Lepidoptera, Lycaenidae). *Cladistics*. 29(2): 166–192. DOI: 10.1111/j.1096-0031.2012.00421.x
- Tshikolovets V., Pagés J. 2016. The Butterflies of Pakistan. Pardubice: Tshikolovets Publications. 328 p., 64 pls.

- Tshikolovets V., Pliushch I., Pak O., Skrylnik Yu. 2018. The Butterflies of Afghanistan. Pardubice: Tshikolovets Publications. 262 p., 55 pls.
- Tshikolovets V.V., Yakovlev R.V., Bálint Zs. 2009. Butterflies of Mongolia. Pardubice: Tshikolovets Publications. 320 p., 48 pls.
- Tutt J.W. 1906. A study of the generic names of the British lycaenides and their close allies. *Entomologists Records*. 18: 129–132.
- Tuzov V.K., Bogdanov P.V., Churkin S.V., Dantchenko A.V., Devyatkin A.L., Murzin V.S., Samodurov G.D., Zhdanko A.B. 2000. Guide to the butterflies of Russia and adjacent territories (Lepidoptera, Rhopalocera). Volume 2. Libytheidae, Danaidae, Nymphalidae, Riodinidae, Lycaenidae. Sofia – Moscow: Pensoft. 580 p.
- Vodolazhsky D.I., Stradomsky B.V., Pljushtch I.G. 2011. Analysis of mitochondrial and nuclear DNA sequences in some butterflies of subgenus *Polyommatus* (s. str.) Latreille, 1804 (Lepidoptera: Lycaenidae) of Afghanistan. *Caucasian Entomological Bulletin*. 7(2): 217–218. DOI: 10.23885/1814-3326-2011-7-2-217-218
- Zhdanko B.A. 2000. Genus *Turanana*. In: Tuzov V.K., Bogdanov P.V., Churkin S.V., Dantchenko A.V., Devyatkin A.L., Murzin V.S., Samodurov G.D., Zhdanko A.B. Guide to the butterflies of Russia and adjacent territories (Lepidoptera, Rhopalocera). Volume 2. Libytheidae, Danaidae, Nymphalidae, Riodinidae, Lycaenidae. Sofia – Moscow: Pensoft: 148–151.

Received / Поступила: 16.10.2023

Accepted / Принята: 22.10.2023

Published online / Опубликовано онлайн: 14.12.2023