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Systematics of the *Satyrium (Superflua) deria* (Moore, 1865) species group with description of a new species from Afghanistan (Lepidoptera, Lycaenidae)

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Abstract

Satyrium (Superflua) deria (Moore, 1865) species group is revised. The group contains four species: *S. (S.) deria* (northern Himalayan region and southwestern Pamirs), *S. (S.) muksuria* Churkin & Pletnev, 2010 (southwestern Alay Mountains and Peter the Great Range), *S. (S.) zabirovi* Churkin & Pletnev, 2010 (from northwestern Pamirs to Darvaz Range), and *S. (S.) hazarajatica* sp. n. (type locality: central Afghanistan, Bamyan Province, Band-e Amir valley, env. Yakawlang). The new species differs from the other members of the group in the male and female genitalia, wing pattern, and colouration. Female genitalia of the *S. (S.) deria*, *S. (S.) muksuria* and *S. (S.) zabirovi* are illustrated and discussed for the first time. *S. (S.) muksuria* is newly recorded from the Alay Mountains. A key to species of the *S. (S.) deria* group is provided.

Key words: Theclinae, Eumaeini, hairstreaks, morphology, genitalia, taxonomy, zoogeography, Hindu Kush, Palaearctic

Introduction

Superflua Strand, 1910 is a Palaearctic subgenus of the Holarctic hairstreak genus *Satyrium* Scudder, 1876. Some authors, e.g. Zhdanko (2000), treated it as a distinct genus based on the male genitalia and appearance, but morphological analysis revealed the unity of *Superflua* with *Satyrium* (Weidenhoffer *et al.* 2004, 2016), which is followed accordingly in our study. The subgenus is comprised of 12 species and divided into three species groups based on the morphology of the genitalia and appearance: *S. (S.) sassanides* (Kollar) species group, *S. (S.) lunulata* (Erschoff) species group, and *S. (S.) deria* (Moore, 1865) species group, inhabiting South Asian mountains from the Zagros across the Kopet-Dagh, Tian-Shan, Alay, Ghissar, Darvaz, Pamirs, and Hindu Kush to the Himalayas. In addition, a morphologically distinct *S. (S.) jebelia* (Nakamura), endemic to the mountains of the southern Sinai Peninsula in Egypt, is distributed far from the main distribution range of *Superflua* (Weidenhoffer *et al.* 2016).

The species of *Superflua* known from Afghanistan have been examined recently (Krupitsky *et al.* 2015a). The study revealed three species including a new one, *S. (S.) skrylniki* Krupitsky, Pljushtch & Pak, 2015. The two other species of *Superflua* known from Afghanistan are *S. (S.) mirabilis* and *S. (S.) deria* (Krupitsky *et al.* 2015a).

Thecla deria Moore, 1865 was described from «Upper Kunawur» (valley of the Spiti River, Kinnaur district, Himachal Pradesh state, India) in the northwestern Himalaya based on three specimens. The lectotype was recently designated by Korb (2014) and deposited in NHML. For a long time *deria* was treated as a subspecies of *S. (S.) sassanides*, but Weidenhoffer *et al.* (2004) proved its specific status. The species can be distinguished from *S. (S.) sassanides* and *S. (S.) mirabilis* by the following combination of characters: vestigial androconial patch on forewing, thick solid postdiscal line curved inwardly at anal angle of hindwing underside, and large sclerotised inward lobes of vinculum in male genitalia (Weidenhoffer *et al.* 2004, 2016). Despite these differences, some authors treated the taxon as a subspecies of *S. (S.) sassanides* (Korb 2014). It is worth noting that the latter species was described from «Persia» and, according to recent studies, inhabits exclusively the southern Zagros Mountains

in the southwestern Iranian Highland (Fars and Shiraz provinces, Iran) (Eckweiler & ten Hagen 2003; Krupitsky *et al.* 2015; Weidenhoffer *et al.* 2004, 2016), while the distribution range of *S. (S.) deria* covers much of the northwestern Himalaya (including the Karakoram and northeastern Hindu Kush) and southwestern Pamirs (Weidenhoffer *et al.* 2004, 2016).

Two more allopatric species related to *S. (S.) deria* were recently described from Central Asia: *S. (S.) muksuria* Churkin & Pletnev, 2010 (type locality: Tajikistan, Peter the Great Range, Depshar vill.) and *S. (S.) zabirovi* Churkin & Pletnev, 2010 (type locality: Tajikistan, western Pamirs, Vanch Mountains, Gyshkhun vill.). These taxa are closely related and share a wing pattern which is nearly identical to that of *S. (S.) deria*; differences were found in the male genitalia, especially in the vinculum and valva (Churkin & Pletnev, 2010). The specific status of these taxa was questioned by Korb (2014) who treated them as synonyms of *deria*. Here we follow Weidenhoffer *et al.* (2016) and treat *S. (S.) muksuria* and *S. (S.) zabirovi* as separate species based on differences in the male genitalia. This treatment is also supported by our study of the female genitalia (see below).

The combination of the diagnostic characters shared by all known species of the *S. (S.) deria* group is as follows: androconial spot vestigial or absent, solid postdiscal line of hindwing strongly curved inwardly at anal angle, and a large external spot of submarginal pattern in Cu2. Thus, three species of the *S. (S.) deria* group were known prior to the current study: *S. (S.) deria* from the northwestern Himalaya, *S. (S.) muksuria* from the Peter the Great Range, and *S. (S.) zabirovi* from the western Pamirs and Darvaz Range (Weidenhoffer *et al.* 2016). During field work in central Afghanistan in 2016 populations of an undescribed species of *Superflua* belonging to the *S. (S.) deria* group were collected in the mountains of Bamyan Province by two junior authors and Yury Skrylnik. The new species is described below.

Material and methods

The dissection, photography of specimens and image processing techniques were described recently (Krupitsky *et al.* 2015a). Images of genitalia were taken with a digital camera Canon EOS 6D equipped with a lens Canon MP-E 65 mm f/2.8, using two Micromed Dual Goose illuminators. The distribution map was generated using SimpleMappr (Shorthouse 2010), and then edited with Adobe Photoshop CS6.

Diagnostic characters applied to the current study, namely the shape of valva, aedeagus morphology, shape of lamella postvaginalis, shape of postdiscal line of hindwing underside, and arrangement of pattern details, are widely used in the genus *Satyrium*, including the subgenus *Superflua* (Lukhtanov 1995; Eckweiler & ten Hagen 2003; Weidenhoffer *et al.* 2004, 2016; Churkin & Pletnev 2010; Krupitsky *et al.* 2015a), as well as in other Palaearctic (Krupitsky *et al.* 2015b; Huang & Zhu 2016) and Neotropical (e.g., Prieto & Vargas 2016) genera of Eumaeini. The wing venation nomenclature follows the Comstock-Needham system adopted for butterflies (Miller 1969). In Eumaeini, allopatric populations, especially those inhabiting different major biogeographical regions, which are characterized by consistent differences in the above-mentioned characters of the male and female genitalia, are usually treated as species, while subspecies are allopatric populations sharing morphology of the genitalia and differing by wing pattern (Krupitsky *et al.* 2015a; Huang, Zhu 2016). This treatment agrees with subspecies concept proposed for butterflies by Braby *et al.* (2012). The studied populations sharing the same genitalia morphology are treated here as potentially reproductively isolated entities based on differences in the genitalia structures.

Abbreviations of the collections used throughout the text are as follows: ZISP, collection of the Zoological Institute, St. Petersburg, Russia; ZMMU, collection of the Zoological Museum of Moscow State University, Moscow, Russia; NHML, collection of the Natural History Museum, London, United Kingdom; AKM, private collection of Anatoly Krupitsky, Moscow, Russia; OPD, private collection of Oleg Pak, Donetsk, Ukraine.

The following specimens were compared with a new species of the *S. (S.) deria* group:

S. (S.) deria: 1 ♂, “Bashahr, India sept.” [India, Himachal Pradesh, Kinnaur and Shimla distr.] (ZISP); 1 ♀, “Таджикистан, г. Хорог, Памир, Ботан. сад, 2300 м, 1979 г. 1/VII, М.Л. Запрягаев” [Tajikistan, W Pamirs, Khorog, botanical garden, 2300 m, 01.VII.1979, Zapryagaev M.L. leg.] (ZISP); 2 ♂, 3 ♀, “Памир, Хорог, ущ. Шахдары, 28.VII.80, В. Прасолов” [Tajikistan, W Pamirs, Khorog, Shakhdara ravine, 28.VII.1980, Prasolov V. leg.] (ZISP); 1 ♀, “Памир, Хорог, ущ. Шахдары, 18.VII.80, В. Прасолов” [Tajikistan, W Pamirs, Khorog, Shakhdara ravine, 18.VII.1980, Prasolov V. leg.] (ZISP); 1 ♂, 1 ♀, “Тадж. ССР, ГБАО, Хорог, Н=2000, xp.

Ишкашимский, 19.VII.983, В. Прасолов” [Tajikistan, W Pamirs, Ishkashim Range, Khorog, 2000 m, 19.VII.1983, Prasolov V. leg.] (ZISP); 1 ♂, “Тадж. ССР, Памир, Ишкашимский хр., ущ. Бодом-Дара, 11.VII.1988, В. Прасолов” [Tajikistan, W Pamirs, Ishkashim ridge, Bodom-Dara creek, 11.VII.1988, Prasolov V. leg.] (ZISP); 1 ♀, “Тадж. ССР, Памир, Ишкашимский хр., ущ. Бодом-Дара, 7.VII.1988, В. Прасолов” [Tajikistan, W Pamirs, Ishkashim ridge, Bodom-Dara creek, 07.VII.1988, Prasolov V. leg.] (ZISP); 7 ♂ (3 specimens dissected), 3 ♀ (dissected), Tajikistan, W Pamirs, Shugnan Range, Khorog, 37°27' N, 71°35' E, 2400 m, 13.VI.2011, Krupitsky A. leg. (AKM); 1 ♂, same locality, 09.VI.1985, Tuzov V. leg. (AKM); same locality, 20.VII.1986, Devyatkin A. leg. (AKM);

S. (S.) *zabirovi*: 1 ♂ (dissected), Tajikistan, W Pamirs, Vanch Range, env. Gyskhkun, 07.VII.1991, Churkin S. leg. (AKM); 1 ♂ (dissected), 1 ♀ (dissected), Tajikistan, Darvaz Mts., Khaburabot pass, env. Khost, 1700 m, 17.VI.2012, Zubov A. leg. (AKM);

S. (S.) *muksuria*: 8 ♂, 3 ♀, “хр. Петра I, ущ. Муксу, хр. Мук, 9.7.79, В. Прасолов” [Tajikistan, Peter the Great Mts., Mook Range, Muksu canyon, 09.VII.1979] (ZISP); 2 ♂, “Таджикистан, р. Обихингоу, к. Ляйрун-Боло, 2.VII.1983, В. Прасолов” [Tajikistan, Obikhingou river, env. Lyairun-Bolo vill., 02.VII.1983, Prasolov V. leg.] (ZISP); 1 ♂ (dissected), 1 ♀ (dissected), Kyrgyzstan, SW Alai Mt. Range, Ok-Suu (Katta-Karamyk) river ravine, 39°30'59.5" N, 71°41'12.7" E, 2400 m, 03.VII.2012, Sobolevskaya Yu. leg. (AKM).

Systematic account

Satyrium (Superflua) hazarajatica Krupitsky, Pljushtch & Pak, sp. n.

(Plate 1, figs. 1–2; plate 2, fig. 1; plate 3, fig. 1)

Material: Holotype: ♂, C Afghanistan, Bamyan prov., 7 km NE Yakawlang, near Gazi vill., Band-e Amir riv. valley, 34°45'57.84" N, 67°02'5.35" E, 2650 m, 15.VI.2016, O. Pak leg. (ZMMU).

Paratypes: 7 ♂ (2 specimens dissected), 3 ♀ (dissected), same label as in holotype (AKM); 4 ♂ (3 specimens dissected), 4 ♀ (3 specimens dissected), C Afghanistan, Bamyan prov., 5 km NE Yakawlang, near Parjak vill., Band-e Amir riv. valley, 34°45'26.18" N, 67°01'8.90" E, 2770 m, 28.VI.2016, O. Pak leg. (AKM); same data, 27 ♂, 12 ♀ (OPD); 1 ♂ (dissected), C Afghanistan, Bamyan prov., 12 km NE Yakawlang, near Gumob vill., Baldarghanak Mt., 2800 m, 34°48'18.41" N, 67°04'3.35" E, 17.VI.2016, O. Pak leg. (AKM); C Afghanistan, Bamyan prov., 12km NE Yakawlang, near Gumob vill., Baldarghanak Mt., h=2800m, 34°48'18.41" N, 67°4'3.35" E, 17.VI.2016, O. Pak leg. (OPD).

Description. Male (plate 1, figs. 1–2).

Head: antenna black, white-ringed at bases of segments, club dark with brown tip. Eye surrounded by white stripe, brown with very short sparse hairs. Frons grey with black hairs on sides, top of head with black and white scales. Palpi: segment 2 white with black spot on base; segment 3 black outside, white inside, with white scales on top.

Thorax: upperside brownish-grey with grey hairs, underside grey with white hairs. Legs white with black scales and white hairs.

Abdomen: upperside brown, underside white.

Forewing: upperside brown, base of forewing lighter than rest of wing. Androconial patch absent. Outer margin same as background. Fringe white. Underside grey, outer margin brownish, underlain by whitish stripe disappearing towards apex. Spaces M3 and Cu1 with blurred black spots. White postdiscal line staircase, underlain by brown, well-developed in all spaces except Cu2 and 1–2A, staircase.

Hindwing: upperside brown (varying from light brown to dark brown), outer margin dark brown, more intense towards tail. Underside grey with bluish scales and hairs in basal area. Outer margin brownish, underlain by broad white stripe disappearing towards apex. Tail long, black with white tip. Fringe white inside, brown outside. Anal lobe small but conspicuous, marked with brush of black hairs and black spot. Postdiscal line rather broad, solid, J-shaped (smoothly inwardly curved), white with nearly reduced adjacent brown band more basally. Pattern of submarginal spots usually reduced in all spaces except Cu1 with small triangular internal black spot underlain by V-shaped white stroke, orange intermedial stroke and small external rounded spot, rarely also with very small black spot suffused by white scales. Spaces Cu2–1A with diffused patch of bluish grey and dark scales, internally shaded

by two white strokes; space 2A with small orange anal spot, small black stroke on inner margin underlain by diffused white line connected with postdiscal line.

Forewing length 15.0 mm in holotype and 13.0–16.0 mm in paratypes.

Male genitalia (plate 2, fig. 1). Falx narrow; valva short, with very massive basal part bearing rounded hump-shaped lateral process, and shorter narrow distal lanceolate part bearing thorn; vinculum inwardly with prominent projections; saccus triangular, rather long, with rounded tip. Aedeagus rather thin, gradually tapering to apex, about 1.4' genitalia length, with thin deflected upper cornutus, very small inwardly curved lower cornutus and deflected sclerotized keel.

Female (plate 1, fig. 3–4). Similar to male but slightly paler. Forewing length 15.0–16.0 mm.

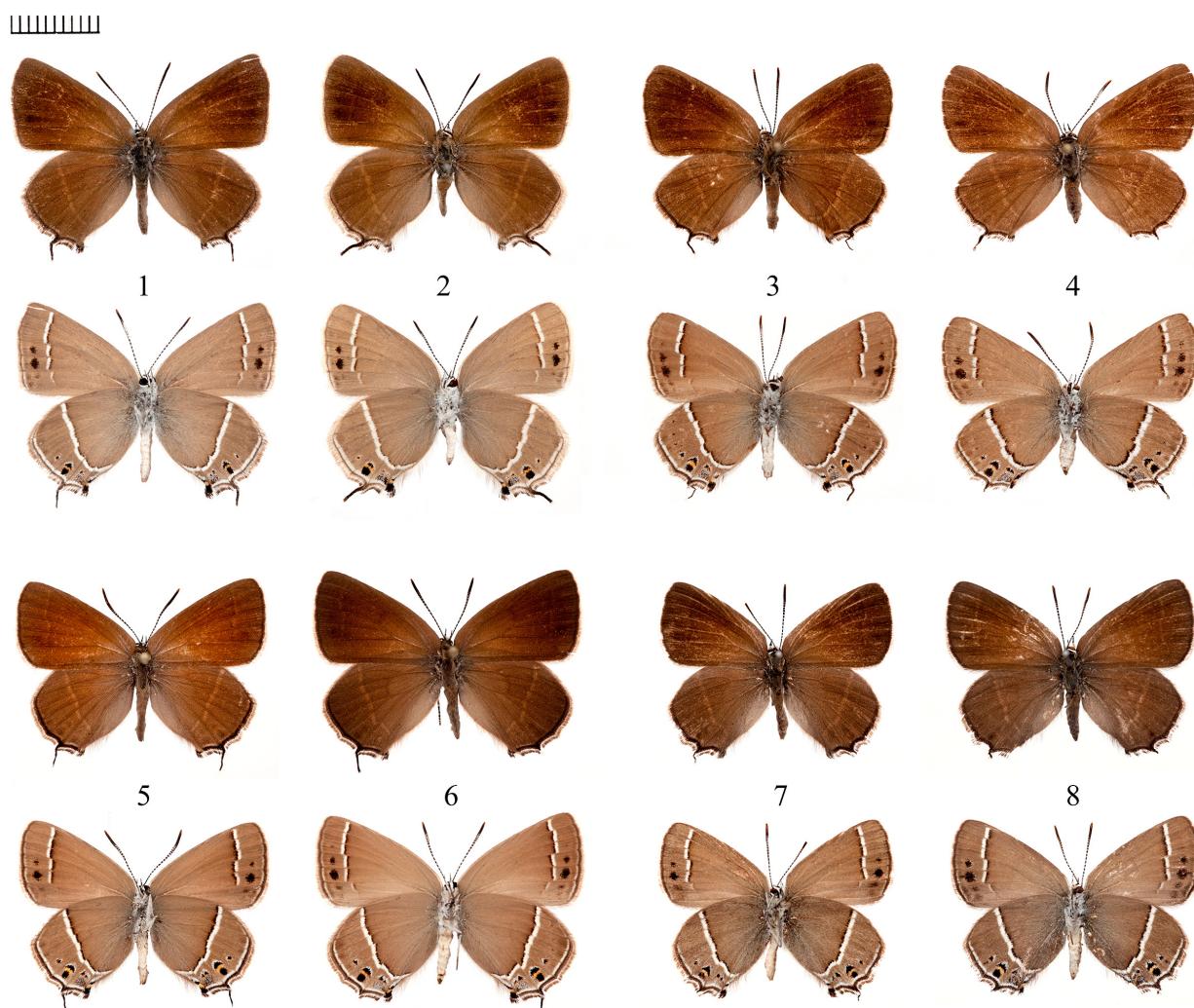


PLATE 1. Species of the *Satyrium (Superflua) deria* group, adults (upperside and underside of wings). Scale bar equals 10.0 mm.

- 1—*S. (S.) hazarajatica* sp. n., holotype, ♂, C Afghanistan, Bamyan prov., 7 km NE Yakawlang, near Gazi vill., Band-e Amir riv. valley, 34°45'57.84" N, 67°02'5.35" E, 2650 m, 15.VI.2016, O. Pak leg. (ZMMU);
- 2—*S. (S.) hazarajatica* sp. n., paratype, ♀, same data (AKM);
- 3—*S. (S.) deria*, ♂, Tajikistan, W Pamirs, Shugnan Range, Khorog, 37°27' N, 71°35' E, 2400 m, 13.VI.2011, Krupitsky A.V. leg. (AKM);
- 4—*S. (S.) deria*, ♀, same data (AKM);
- 5—*S. (S.) zabirovi*, ♂, Tajikistan, Darvaz Mts., Khaburabot pass, env. Khost, 1700 m, 17.VI.2012, Zubov A. leg. (AKM);
- 6—*S. (S.) zabirovi*, ♀, same data (AKM);
- 7—*S. (S.) muksuria*, ♂, Kyrgyzstan, SW Alai Mt. Range, Ok-Suu (Katta-Karamyk) river ravine, 39°30'59.5" N, 71°41'12.7" E, 2400–2950 m, 03.VII.2012, Sobolevskaya Yu. leg. (AKM);
- 8—*S. (S.) muksuria*, ♀, same data (AKM).

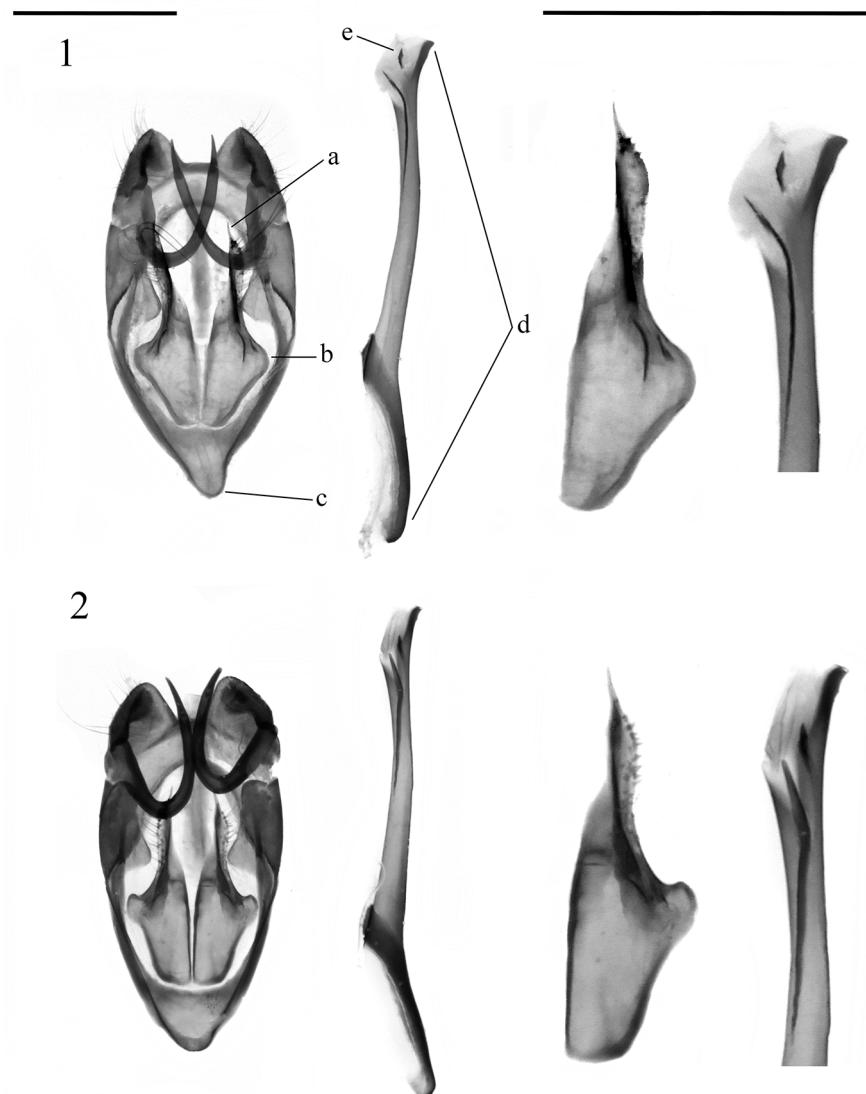


PLATE 2. Species of the *Satyrium (Superflua) deria* group, male genitalia (genital capsule in ventral view, aedeagus in lateral view; valva and distal part of aedeagus enlarged). Scale bars equal 1 mm. Letters indicate on diagnostic characters of the new species: a—length of distal part of valva, b—shape of basal part of valva, c—shape and length of saccus, d—shape of aedeagus, e—shape of inner cornutus. Explanations see in Diagnosis part.

1—*S. (S.) hazarajatica sp. n.*: paratype, C Afghanistan, Bamyan prov., 5 km NE Yakawlang, near Parjak vill., Band-e Amir riv. valley, 34°45'26.18" N, 67°01'8.90" E, 2770 m, 28.VI.2016, O. Pak leg. (AKM)

2—*S. (S.) deria*: Tajikistan, W Pamirs, Shugnan Range, Khorog, 37°27' N, 71°35' E, 2400 m, 13.VI.2011, Krupitsky A.V. leg. (AKM);

Female genitalia (plate 3, fig. 1). Lamella postvaginalis rounded, evenly sclerotised, antrum funnel-shaped, gradually convergent, turning into short straight ductus bursae; bursa membranous, with two very large bidentate signa. Papilla analis large, wide, gradually tapering to tip, apophysis posterioris rather short (about 1,2' of papilla length) and thin.

Individual variations. Shape of the white submarginal line slightly varies as well as shape and length of wings. One paratype male from the type locality with a full row of small submarginal spots on the hindwing underside. Conspicuous variation in the male and female genitalia is absent.

Diagnosis. *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). Extended triangle saccus, long slightly curved aedeagus with slightly upturned basal

part and strongly deflected sclerotized keel, curved inner cornutus in aedeagus and elongate distal process of valva are unique characters in the male genitalia of the new species. Well developed inward projections of vinculum make the new species similar to *S. (S.) deria*. Compared with the latter, *S. (S.) hazarajatica* sp. n. has longer valva reaching base of falx (shorter valva failing to reach base of falx in *deria*), hump-shaped lateral process of base of valva (auriform in *deria*), longer and slightly curved aedeagus (shorter aedeagus with strongly upturned basal section in *deria*), thinner arcuate upper cornutus (very thick, slightly deflected in *deria*), curved inner cornutus and strongly deflected sclerotised keel (nearly straight, slightly deflected in *deria*). The shape of the basal part of valva makes the new species similar to *S. (S.) muksuria* and *S. (S.) zabirovi*, but they both have shorter valvae with different distal processes: thick in the first case and very thin in the second. Moreover, compared with *S. (S.) muksuria* and *S. (S.) zabirovi*, the new species has more thin and straight aedeagus (thick arcuate aedeagus in *muksuria* and *zabirovi*). Female genitalia of the new species are characterized by evenly sclerotised rather narrow rounded lamella postvaginalis, rather thin basal part of ductus, and thin long posterior apophyse (lamella postvaginalis broad, triangular, consisting of two sclerotized parts compounded by medial membranous stripe, posterior apophyse thicker in the other species of the *deria* group).



PLATE 2. (continued)

3—*S. (S.) zabirovi*: Tajikistan, W Pamirs, Vanch Range, env. Gyshkhun, 07.VII.1991, Churkin S. leg. (AKM);

4—*S. (S.) muksuria*: Kyrgyzstan, SW Alai Mt. Range, Ok-Suu (Katta-Karamyk) river ravine, 39°30'59.5" N, 71°41'12.7" E, 2400 – 2950 m, 03.VII.2012, Sobolevskaya Yu. leg. (AKM).

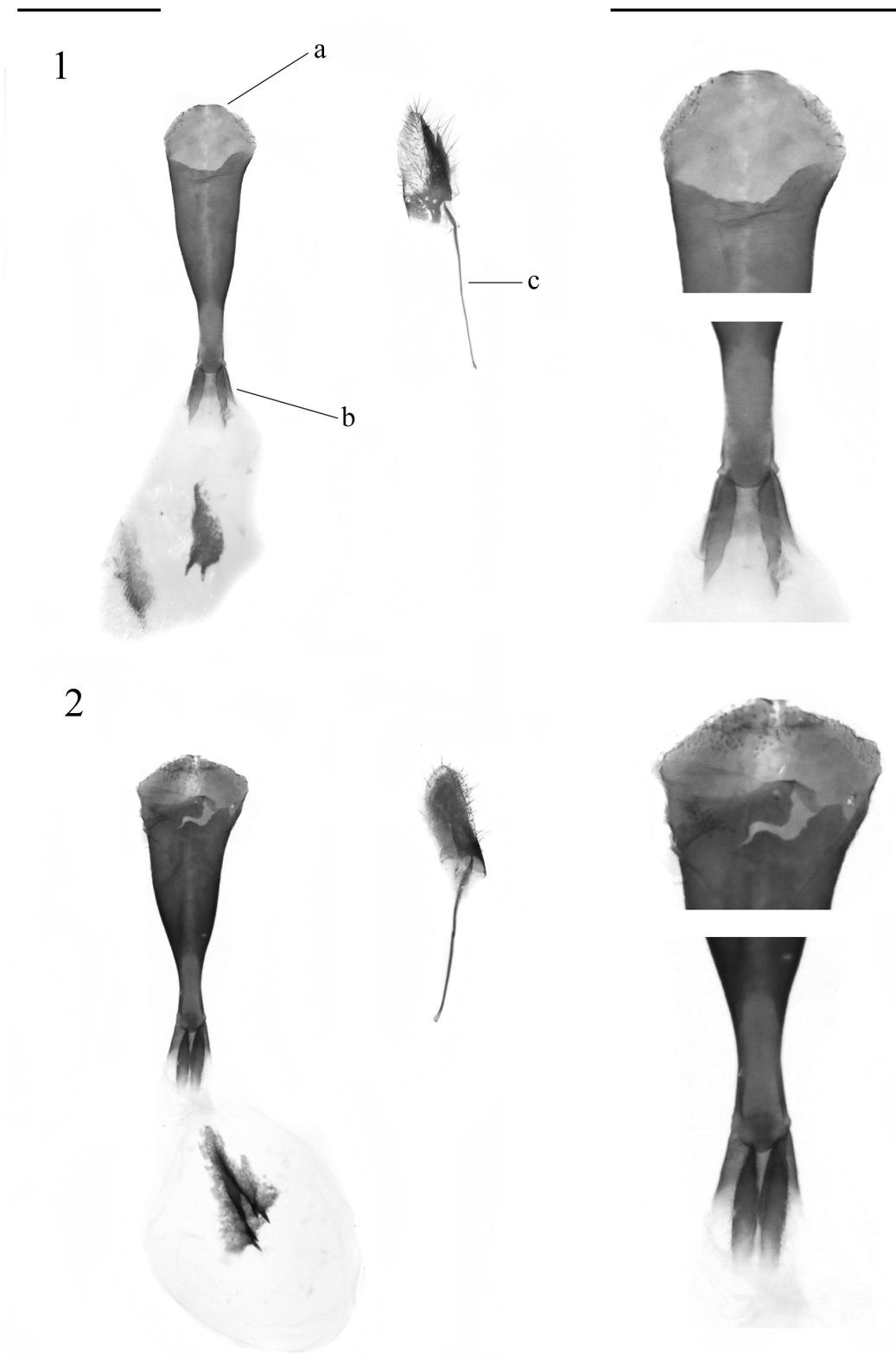
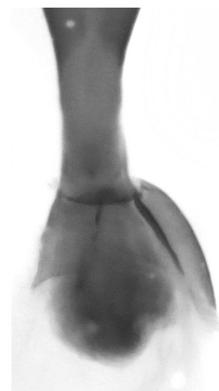


PLATE 3. Species of the *Satyrium (Superflua) deria* group, female genitalia, ventral view; enlarged distal and proximal parts of ductus, ventral view. Scale bars equal 1 mm. Letters indicate on diagnostic characters of the new species: a—shape and sclerotization of lamella postvaginalis, b—thickness of base of ductus, c—thickness of posterior apophyse. Explanations see in Diagnosis part.

1—*S. (S.) hazarajatica* sp. n.: paratype, C Afghanistan, Bamyan prov., 5 km NE Yakawlang, near Parjak vill., Band-e Amir riv. valley, 34°45'26.18" N, 67°01'8.90" E, 2770 m, 28.VI.2016, O. Pak leg. (AKM);

2—*S. (S.) deria*: Tajikistan, W Pamirs, Shugnan Range, Khorog botanical garden, 37°27' N, 71°35' E, 2400 m, 13.VI.2011, Krupitsky A. V. leg. (AKM);

3



4

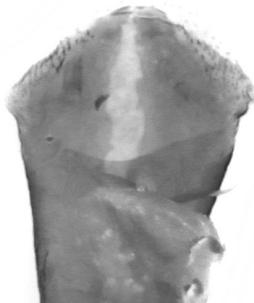


PLATE 3. (continued)

3—*S. (S.) zabirovi*: Tajikistan, Darvaz Mts., Khaburabot pass, env. Khost, 1700 m, 17.VI.2012, Zubov A. leg. (AKM);

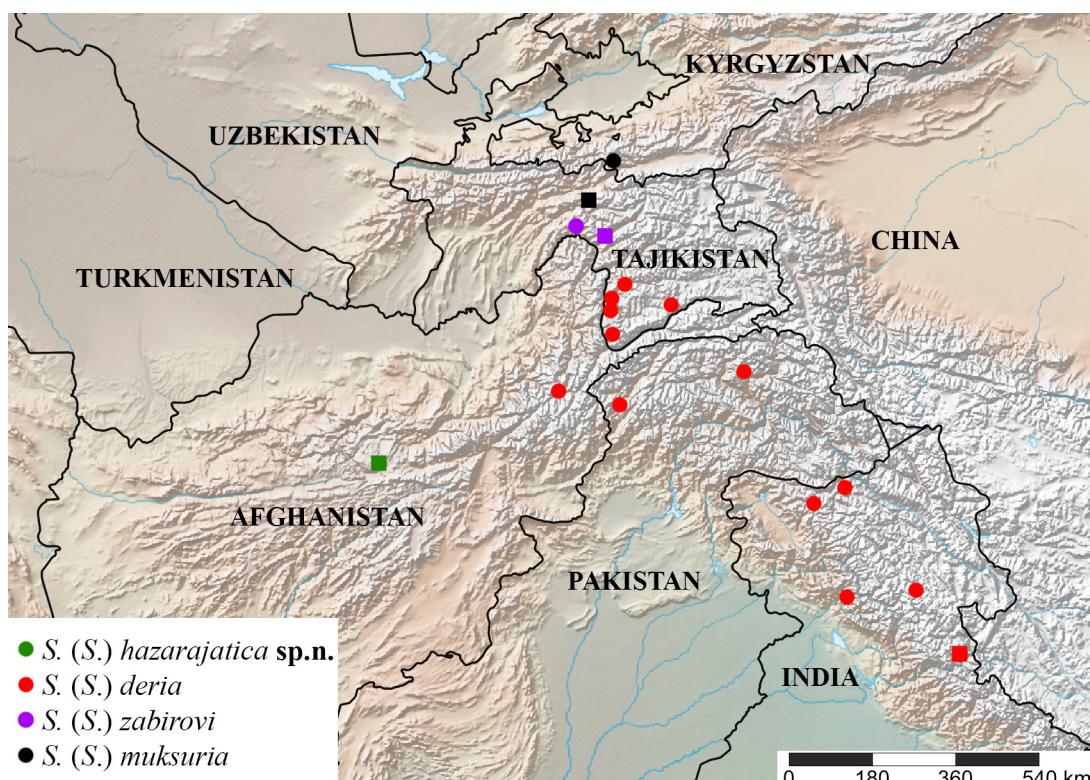
4—*S. (S.) muksuria*: Kyrgyzstan, SW Alai Mt. Range, Ok-Suu (Katta-Karamyk) river ravine, 39°30'59.5" N, 71°41'12.7" E, 2400 – 2950 m, 03.VII.2012, Sobolevskaya Yu. leg. (AKM).

Etymology. The new species is named after Hazarajat, historical region in central Afghanistan inhabited by the Hazara people. This region includes the Band-e Amir Mts. where the type locality of the new species is situated.

Distribution and biology. As far as we know, the distribution range of *S. (S.) hazarajatica sp. n.* is restricted to a small sector of the valley of the Band-e Amir River at an altitude of 2700–2800 m above sea level, higher than the other species of the *deria* group. Adults are on wing in June. The new species is probably endemic to the Band-e Amir river valley between the Koh-i-Baba and Koh-i-Hisar ranges in the southwestern foothills of the Hindu Kush, Bamyan Province, central Afghanistan (plate 4). This locality is strongly isolated from those of the other species of the *deria* group, which inhabit the Himalayan region, Pamirs, Darvaz and Alay, though it is close to the type locality of a recently described *S. (S.) skrylniki* Krupitsky, Pljushtch & Pak, 2015 that belongs to the *sassanides* group (Krupitsky *et al.* 2015a) and *Callophrys succuba* Krupitsky, Pljushtch & Pak, 2015, which also has close relatives in the Iranian Highland (Krupitsky *et al.* 2015b). The discovery of the new species from the *S. (S.) deria* species group confirms a unique zoogeographical status of the mountains of central Afghanistan, which hosts both Irano-Turanian and Western-Himalayan species as well as endemic species (Kryzhanovsky 2002; Krupitsky *et al.* 2015a; Krupitsky *et al.* 2015b).

Notes. We report here the first record of *S. (S.) muksuria* in the Alay Mountains in Kirgystan (for the data see Materials and methods). The presence of the species in the Alay valley was suspected by Churkin & Pletnev (2010). Specimens from the Alay show no significant differences in the appearance and the male and female genitalia structure.

The female of *S. (S.) skrylniki* Krupitsky, Pljushtch & Pak, 2015 from Band-e Amir depicted in Weidenhoffer *et al.* (2016: 49) actually belongs to *S. (S.) hazarajatica sp. n.*



Key to species of the *Satyrium (Superflua) deria* species group

- 1 Fringe whitish; wings underside pale, grey; postdiscal band with strongly reduced black suffusion. Aedeagus long, slightly curved, with slightly upturned basal section, inner cornutus curved; saccus extended, triangle; valva with elongate distal process. Lamella postvaginalis narrowed, rounded, evenly sclerotized. Band-e Amir Mts. *S. (S.) hazarajatica sp. n.*
- Fringe from greyish to brown; underside dark, from greyish-brown to brown; postdiscal band underlain by black stripe. Aede-

	agus short, with strongly upturned basal section and straight inner cornutus; saccus shortened, rounded; valva with shortened distal process. Lamella postvaginalis broadend, triangle, consisted of two sclerotized parts compounded by membranous stripe	2
2	Vinculum with large inward projections; valva with prominent auriform process; lamella postvaginalis short and very broad; aedeagus with nearly straight distal part. Base of ductus thin; papilla analis thick, ovoid. W Himalaya, S Pamirs	<i>S. (S.) deria</i>
-	Vinculum with reduced inward projections; valva with hump-shaped process; lamella postvaginalis long and broad; aedeagus with curved distal part. Base of ductus thick; papilla analis thin, elongated	3
3	Vinculum with very small inward projections; distal process of valva thick. Sides of lamella postvaginalis straight. Peter the Great Range, Alai Mts.	<i>S. (S.) muksuria</i>
-	Vinculum with small but prominent inward projections; distal process of valva very thin. Sides of lamella postvaginalis rounded. Vanch and Darvaz Mts.	<i>S. (S.) zabirovi</i>

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