

On the identity of taxa of the genus *Boloria* (*Smoljana*) *rhodopensis* (Lepidoptera: Nymphalidae, Heliconiinae)

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Samenvatting. Over de identiteit van enkele taxa uit het genus *Boloria* (Lepidoptera: Nymphalidae: Heliconiinae)

De studie van het type-materiaal van *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995 bevestigde dat dit taxon taxonomisch identiek is aan *Boloria* (*Boloria*) *graeca balcanica* (Rebel, 1903). De volgende nieuwe synonymie werd tot stand gebracht: *Boloria* Moore, [1900] = *Smoljana* Slivov, 1995 **syn. n.** en *Boloria* (*Boloria*) *graeca balcanica* (Rebel, 1903) = *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995, **syn. n.**

Résumé. Sur l'identité de certains taxons du genre *Boloria* (Lepidoptera: Nymphalidae, Heliconiinae)

L'étude du matériel-type de *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995 a confirmé que ce taxon est taxonomiquement identique à *Boloria* (*Boloria*) *graeca balcanica* (Rebel, 1903). La nouvelle synonymie suivante est établie: *Boloria* Moore, [1900] = *Smoljana* Slivov, 1995 **syn. n.** en *Boloria* (*Boloria*) *graeca balcanica* (Rebel, 1903) = *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995, **syn. n.**

Abstract. An examination of the type material of *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995 revealed its identity to *Boloria* (*Boloria*) *graeca balcanica* (Rebel, 1903). The following new synonymy has been established: *Boloria* Moore, [1900] = *Smoljana* Slivov, 1995 **syn. n.** and *Boloria* (*Boloria*) *graeca balcanica* (Rebel, 1903) = *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995, **syn. n.**

Key words: Lepidoptera – Nymphalidae – Heliconiinae – *Boloria* – taxonomy – synonym – types – Europe – Bulgaria.

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Introduction

Modern papers, containing descriptions of new butterfly taxa from Bulgaria, are considered a great rarity and, as far as Bulgarian zoological journals are concerned, they are even extraordinary. Somewhat unexpectedly, such a paper was published recently (Slivov, 1995). The work contains descriptions of a new genus-group and a new species-group nominal taxa as quoted below:

“*Smoljana* subgen. n.” Slivov, 1995: 62. Type species: *Boloria* (*Smoljana*) *rhodopensis* Slivov, 1995.

Original description: “*Smoljana* subgen. n. — form and venation of the wings similar to that of the genus *Boloria*. Uncus large, with bent almost at a right angle down distal half, and broad membrane in the central part. (Fig. 1)”.

“*Boloria* (*S.*[*moljana*]) *rhodopensis* sp. n.” Slivov, 1995: 63–65.

Original description: “[p. 63] *Boloria* (*S.*) *rhodopensis* sp. n. (Fig. 4 — 1, 2) — ♂ Similar to *B. graeca balcanica* Rbl. The termen and the apex of the forewing rounded. Dark marginal spots on the upper side of the forewing oval. Postdiscal spots on the upper side of [p. 64] hindwing thin, elongated and connected with veins in broken band; antemarginal and submarginal row of spots one next to the other. The dark antemarginal spots from the under surface of the forewing large and intensively coloured. Antemarginal spots on the under side of the hindwing round: in the 3rd and 6th cells, with a yellowish dot in the centre, in cell 1c very small and connected with dark spot in the submarginal field (Fig. 4 — 3).

♀ a little longer and paler. Spots on the under side of hindwings greenish.

[p. 65] Length of the forewing: ♂ 16 — 17 mm; ♀ 17.5 — 19 mm.

♂ genitalia (Fig. 2) similar to *B. graeca balcanica* Rbl. Tip of valva rounded. Distal part of costal growth triangular with numerous small spines on the upper surface, inner side rough, with broad central part and almost sharp tip. Penis lightly curved in middle and with thin cecum.”

Type locality: [p. 66]: “West Rhodopes, Smoljan lakes, 1600 — 1700 m a.s.l.”

Type material: [p. 66]: “Holotype ♂ West Rhodopes, Smoljan lakes, 1600 — 1700 m a.s.l., 13–14.07.1979 on damp meadows, leg. et coll. Al. Slivov.

Paratype [sic]: 16 ♂♂ [sic] and 3 ♀♀ from the same locality and the same date, leg. et coll. Al. Slivov.”

The above citations are accompanied with 3 black and white figures. Fig. 1 in Slivov (l. c. p. 63) is an unclear photo of “uncus of male genitalia of *Smoljana* subgen. n.”. The uncus is illustrated repeatedly on Fig. 2 (l. c. p. 63) together with other structures (reproduced here on Fig. 1). Fig. 4 combines 6 photographs of the type specimens with inadequate explanation: “Fig. 4. *Boloria (Smoljana) rhodopansis* [sic] sp. n. 1 — upper surface of ♂; 2 — upper surface of ♀; 3–6 — under surface of ♂♂ (3 — *typus*; 4–6 *paratypae* [recte: *paratypi*])” (see below).

Type material of *Boloria (S.) rhodopensis*

In examining the type material of *Boloria (S.) rhodopensis*, kept in the collection of the Institute of Zoology, Sofia, it was established that it was not properly labelled; no identity labels stating the status of types were attached to the specimens from the type series (disregarding recommendation 72B of the ICZN); and only a label “BOLORIA Sl. [sic] | rhodopensis” (Fig. 6) pinned below the type series exists. Additionally, the number of type specimens is 21 and not 20 (see the above citation about type material).

In fact the type series consists of:

Holotype ♂, with labels: (1) printed (on white paper) “Rodopi, h. Smol.[yan] | ezera [lakes], 1600 m | 13-14.7.79, Slivov”; (2) printed (on red paper), double framed “HOLOTYPE ♂ | *Boloria (Smoljana) | rhodopensis* Slivov, 1995 | *Boloria (S.) rhodopensis* sp. n. | Slivov, A. V., 1995 | (A review of the species — | *Acta zool. bulg.* 48: 63) | [line] | label attachment S. Abadjiev, 1999”; (3) printed (on white paper) “*Boloria (Boloria) graeca* | (Staudinger, 1870) ♂ [handwritten] | S. Abadjiev det. 1999”; (4) printed (on white paper) “Gen. slide No. 1 | 2.XII.1999 | S. Beshkov prep. | [line] | *Boloria (Boloria) graeca* | (Staudinger, 1870) ♂ | S. Abadjiev & | S. Beshkov det. 1999”; in coll. Institute of Zoology, Sofia.

Paratypes 17♂, 3♀ with labels: (1) printed (on white paper) “Rodopi, h. Smol. | ezera, 1600 m | 13–14.7.79, Slivov”; (2) paratype [11] with handwritten (on white paper) “gen. pr. [in cyrillic] | Nr | 901”; paratype [12] with handwritten (on white paper) “gen. pr. [in cyrillic] | Nr. | 902”; paratype [13] with handwritten (on white paper) “gen. pr. [in cyrillic] | Nr. | 903”; paratypes [14] and [15] with handwritten (on white paper) “gen. pr. [in cyrillic] | Nr. | 904”; paratype [16] with handwritten (on white paper) “gen. pr. [in cyrillic] | Nr. | 905”; (3) all the paralectotypes with printed (on red paper), double framed “PARATYPE [number 1–20 respectively] ♂ [♀ respectively] | *Boloria (Smoljana) | rhodopensis* Slivov, 1995 | *Boloria (S.) rhodopensis* sp. n. | Slivov, A. V., 1995 | (A review of the species — | *Acta zool. bulg.* 48: 63) | [line] | label attachment S. Abadjiev, 1999; (4) all the paralectotypes with printed (on white paper) “*Boloria (Boloria) graeca* | (Staudinger, 1870) ♂ [♀ respectively] [handwritten] | S. Abadjiev det. 1999”; in coll. Institute of Zoology, Sofia.

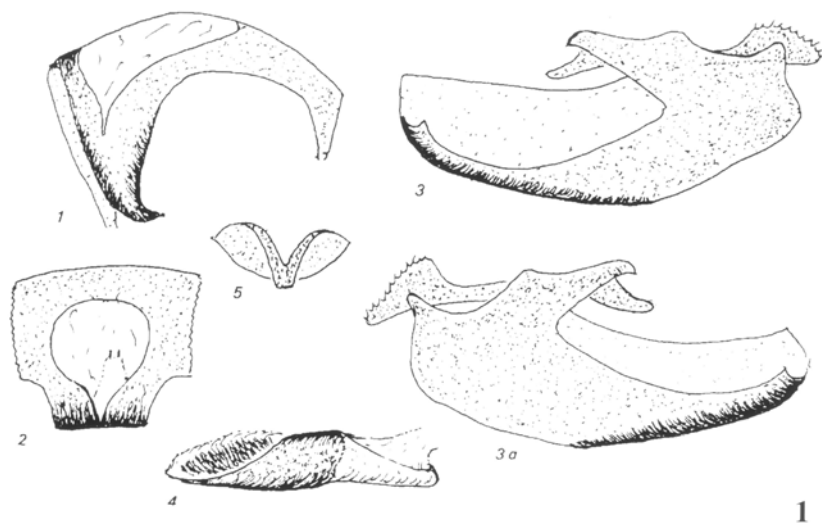
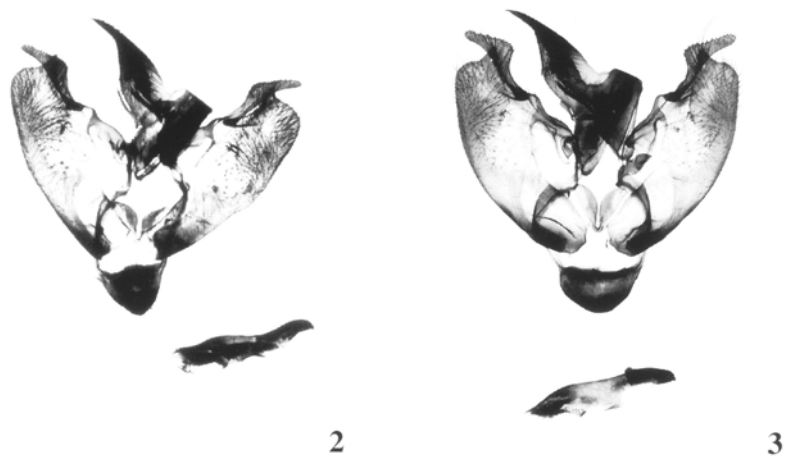
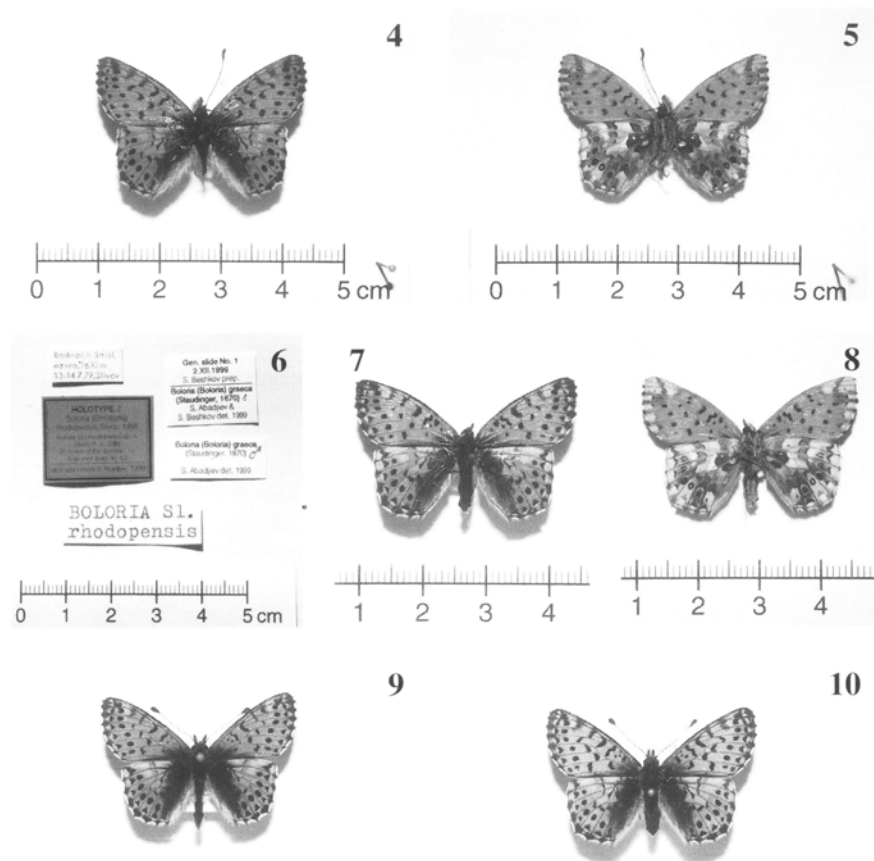


Fig. 1: "Male genitalia of *Boloria (Smoljana) rhodopensis* sp. n. 1 and 2 – uncus; 3 and 3a – right and left valvae; 4 – penis; 5 – juxta" (original drawing reproduced from Slivov 1995: 63, Fig. 2).



Figs. 2–3: Male genitalia: 2 – holotype of *Boloria (Smoljana) rhodopensis* Slivov, 1995; 3 – *Boloria (Boloria) graeca balcanica* (Rebel, 1903), Rila Mts., 3.VI.1986, Radev Leg. (Gen. slide 10/22.XII.94, S. Beshkov coll.).



Figs. 4–10: 4 — holotype of *Boloria (Smoljana) rhodopensis* Slivov, 1995, 5 — same, underside, 6 — same, labels, 7 — paratype [20] of *Boloria (Smoljana) rhodopensis* Slivov, 1995, 8 — same, underside, 9 — *Boloria (Boloria) graeca balcanica* (Rebel, 1903) ♂, E Rila Mts., Belmeken, 2000 m, 23.VIII.1997, S. Abadjiev leg. et coll., 10 — *Boloria (B.) graeca balcanica* ♀, Rila Mts., Rilska Valley, 1950 m, 29.VII.1994, S. Abadjiev leg. et coll.

A label stating “HOLOTYPE” has been attached to the specimen illustrated on Fig. 4: 3 in Slivov’s paper (bearing figure explanation “3 — typus” (Art. 73 (b), ICZN)) and on Figs. 4, 5 here; the specimen’s right antenna is broken and missing; the head is rotated and the left antenna is positioned to the right (after preparation). Labels stating “PARATYPE” have also been attached to the rest of the specimens. The following additional specimens are illustrated in Slivov (1995: 65): Fig. 4: 1 — paratype [10]; Fig. 4: 2 (upperside) and 5 (underside) — paratype [20]; Fig. 4: 4 — paratype [12]; Fig. 4: 6 — paratype [4]. It should be noted that Fig. 4: 5 in Slivov shows the same specimen [♀]

as on Fig. 4: 2 and not “under surface of ♂” (cf. citation about text explanation of Fig. 4 in Slivov’s paper above). The same is illustrated on Figs. 7, 8 here. The additional 21st paratype specimen is probably the one labelled as number [17]; the specimen’s abdomen is absent; it was identified here as a male only after the external features.

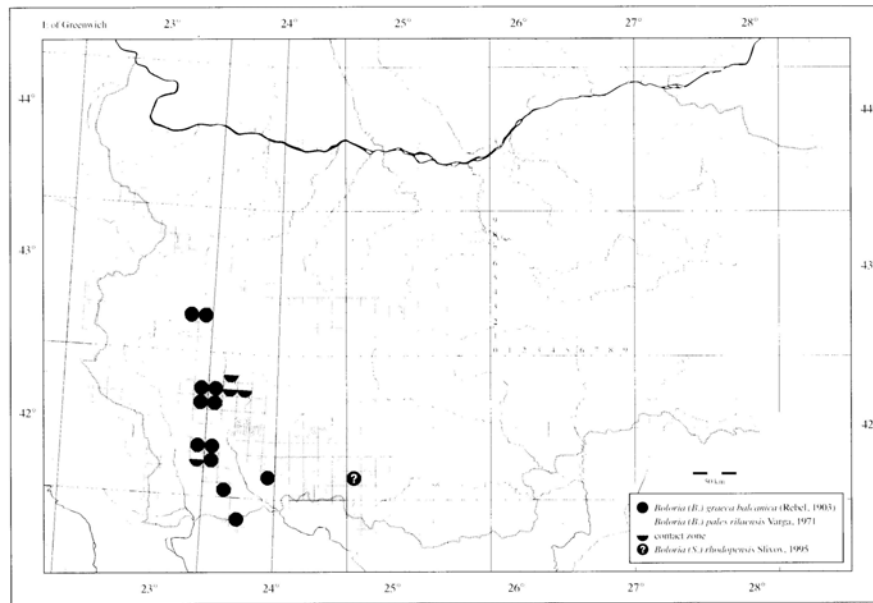


Fig. 11. UTM map showing the known distribution of *Boloria (Boloria)* spp. in Bulgaria and the position of the type locality of *Boloria (Smoljana) rhodopensis* Slivov, 1995.

Origin of the type material of *Boloria (S.) rhodopensis*

The type locality of *Boloria (Smoljana) rhodopensis* (Smolyan Lakes) is in the square with UTM grid reference 35TLG01; it is widely separated from the known range of distribution of other high montane *Boloria (Boloria)* spp. in Bulgaria (Fig. 11).

Very recently, special enquiries in order to locate this species (or other representatives of the subgenus *Boloria*) in this area have been done; all of these proved fruitless (S. Beshkov; Z. Kolev, pers. comm.). The possible mislabelling of the specimens of the type series, needs to be mentioned here, although we do not have any clear evidence at hand. It is possible that they do not come from the Rhodopi Mountains at all, as has also been established for at least part of the material of *Erebia orientalis* Elwes, 1900 and *Euphydryas cynthia* ([Denis & Schiffermüller], 1775) from Slivov’s collection.

Taxonomic status of the taxa named by A. Slivov

A closer look at Slivov’s descriptions of new taxa has revealed some inconsistencies and contradictory data (cf. citations of original descriptions above): on the one hand “*Smoljana* subgen. n.” is similar in form and wing venation to that of *Boloria*, but its uncus is “large, with bent almost at a right angle down distal half” and on the other hand,

the male of “*Boloria (S.) rhodopensis* sp. n.” is similar to *Boloria graeca balcanica* both in general appearance and in genitalia (the characteristic features of the uncus were not mentioned!). As additional evidence of Slivov’s own misunderstanding of the matter, it should be noted, that immediately after the taxonomic features stated in “Key to subgenus [sic] and species of the genus *Boloria* in Bulgaria” (l. c. p. 66), some unnecessary statements are added, such as: “Occurs in Western Rhodopes” for *Smoljana* and “Occuring [sic] in higher parts of Vitosha, Rila, Pirin and Slavjanka Mountains” for subgenus *Boloria* (implying that every population from the Rhodopi Mountains should belong to *Smoljana* and every population from mountains of Vitosha, Rila, Pirin or Slavyanka should belong to *Boloria*).

Independently from forementioned data, the examination of the specimens from the type series of *Boloria (S.) rhodopensis* has revealed that they are indistinguishable from *Boloria (B.) graeca* (Staudinger, 1870) (cf. Figs. 4, 5, 7, 8, 9, 10) and, which is more important, the same applies to the male genitalia (cf. Figs. 2, 3). After examining the male genitalia of the holotype of *Boloria (S.) rhodopensis*, it has become clear that the misidentification (and the subsequent descriptions of new taxa) was a result of improper genitalic preparation done by the author. In this context, it is important to mention that an access to genitalic slide(s) made by Slivov himself was denied, notwithstanding our request.

As a result, we establish the following synonymy: *Smoljana* Slivov, 1995 (type species: *Boloria (Smoljana) rhodopensis* Slivov, 1995) to be a junior subjective synonym of *Boloria* Moore, [1900] (type species: *Papilio pales* [Denis & Schiffermüller], 1775, **syn. n.**; *Boloria (Smoljana) rhodopensis* Slivov, 1995 to be a junior subjective synonym of *Boloria (Boloria) graeca balcanica* (Rebel, 1903), **syn. n.**; *B. (S.) rhododpansis* Slivov, 1995 (65: Fig. 4 [text explanation]) is an incorrect subsequent spelling of *B. (S.) rhodopensis* Slivov, 1995, unavailable name.

Acknowledgement

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Reference

Slivov, A. V., 1995. A review of the species of the genus *Boloria* Moore, 1900 (Lepidoptera, Nymphalidae) from Bulgaria and description of a new subgenus and a new species. — *Acta zool.bulg.* **48**: 62–67.