Description of a new subspecies of *Erebia cassioioides* (Reiner & Hohenwarth, 1792) (Lepidoptera: Nymphalidae: Satyrinae) from Bulgaria

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Erebia cassioioides centrorilica ssp. n. from Rila Mountains, Bulgaria is described and figured. It is compared with other subspecies known from the Balkan Peninsula and especially with the closest *E. cassioioides macedonica* Buresch, 1918 and *E. cassioioides kinoshitai* Beshkov, 1996. The recent distribution of *E. cassioioides* (Reiner & Hohenwarth, 1792) in the mountains of Balkan Peninsula is displayed as a typical example of Glacial disjunction. Some bionomical notes are given.

Key-words: Satyrinae - Erebia - new subspecies - taxonomy - Bulgaria - Europe.

INTRODUCTION

The Common Brassy Ringlet, *Erebia cassioioides* (Reiner & Hohenwarth, 1792), is a characteristic representative of the Bulgarian high montane and alpine fauna. It also occurs in the mountains of Spain, France, Switzerland, Austria, Italy, Bosna and Herzegovina, Yugoslavia, Albania, Macedonia, Greece and Rumania. The Bulgarian part of the species range consists of three well separated geographically groups of colonies: in Stara Planina Range, Rila and Pirin Mountains (Fig. 1). The recent distribution can be considered as a typical example of Glacial disjunction.

Taxonomically the species is polytypic; formerly four endemic subspecies were known from the Balkan Peninsula. *Erebia cassioioides illyrica* Lorković, 1953 occurs in Bosna and Hercegovina (Maglič), Montenegro (Volujak, Durmitor, Žljeb) and North Albanian Alps; *Erebia cassioioides illyromacedonica* Lorković, 1953 occupies Macedonian mountains Šar, Korab, Jakupica and Pelister; *Erebia cassioioides macedonica* Buresch, 1918 is known from Pirin and *Erebia cassioioides kinoshitai* Beshkov, 1996 from Stara Planina. The taxon inhabiting Central Pindos Range (Athanason Mts) in Greece remains unnamed.

The occurrence of the species in Rila Mountains has been well known for many years but paradoxically specimens from this region have been considered great rarity (showing even a total absence in public collections). In 1998 during my visit to
Central Rila Mountains a fine series of specimens was collected. Additional material was gathered in 2000 in NW Rila. In a subsequent examination and comparison with specimens of the closest taxa from other mountains the taxon inhabiting Rila has also been found different taxonomically. Here it is described and named as follows.

Terminology concerning external anatomy used here follows the standard one already used by Higgins (1975), Higgins & Riley (1984), Tolman & Lewington (1997), etc. All the measures were taken with the help of a stereomicroscope MBS-10.

Acronyms used:

- CIZS Institute of Zoology, Sofia, Bulgaria
- CSAS Stanislav P. Abadjiev, Sofia, Bulgaria
- CSBS Stoyan Beshkov, Sofia, Bulgaria
- MHNG Muséum d’histoire naturelle, Geneva, Switzerland
- NMNH National Museum of Natural History, Sofia, Bulgaria

**Erebia cassioides centrorilica** ssp. n.

*Type locality:* Bulgaria: [Central] Rila Mts: [SW slope of] Suha Vapa [Peak]: 2450 m (holotype label, see below).

*Type material:*


- **Paratypes** 24 δ δ, 4 ♀ ♀ of which: 1 δ, 1 ♀ with data labels same as in the holotype, but from 2200 m, and with additional rows “[line] / S. Abadjiev coll. 1277 (1278 respectively)”; 2 δ δ with labels: same as above, but from 2350 m, and in the last row “S. Abadjiev coll. 1331 (1332 respectively)”; 5 δ δ, 1 ♀ with data labels same as in the holotype with additional rows “[line] / S. Abadjiev coll. 1311 (1312, 1322, 1324, 1325 and 1327 respectively)”; 2 δ δ with data labels same as in the holotype: 1 δ with labels: (1) printed (on white paper) “Bulgaria, Rila Mts., / Dzhanka, 2400 m., / 03.VIII.1996, / S. Beshkov & / J. Nowacki leg.”; (2) printed (on light green paper) with handwritten inscriptions [here italicised] “Green. prep. / No. 6/03.III.97 / S. Beshkov”, (3) handwritten (on yellow paper) “E. cassioides / macedonica / Buresch. 1918”; 1 δ with labels: (1) printed (on white photo paper) “BULGARIA, Rila. mount. / Granthar hut, 2180 m. / 29.08.1987 / St. Beshkov leg.”; (2) handwritten (on white paper) “Gen. prep. 6./ / 06.III.1995 / Beshkov”; 1 δ with labels: (1) printed (on white photo paper) “Bulgaria, Rila Mt. / under Kanarata Top / 2500 m. / 30.VIII.1987 / S. Beshkov leg.”; (2) handwritten (on white paper) “Gen. prep. 4./ / 06.III.1995 / Beshkov”; 1 δ with labels: (1) printed (on white photo paper) “Bulgaria, Rila Mt. / under Angelov Vrah / Top. 2600 m. / 31.VIII.1987 / S. Beshkov leg.”; (2) handwritten (on white photo paper) “Gen. prep. 6./ / 06.III.1995, / Beshkov”; 1 ♀ with labels: (1), printed (on white photo paper) “Bulgaria, Rila Mt. / under Angelov Vrah / Top. 2600 m. / 31.VIII.1987 / S. Beshkov leg.”; (2) handwritten (on white paper) “Gen. prep. 6./ / 06.III.1995, / Beshkov”; 2 δ δ, 1 ♀ with labels: printed (on white paper) “BULGARIA / Rila Mts / [above Rilski Manastir] / VIII.1987 / [R. Radev leg.]”;
- 2 δ δ with data labels: printed (on white paper) “BULGARIA / Rila Mts / Tcherni Ridge 2300 m / 24.VII.2000 / Dr S. Abadjiev leg. / [line] / Dr S. Abadjiev coll. 1762 (1763 respectively); 4 δ δ with labels: same as above, but from 2400 m, and in the last row “Dr S. Abadjiev coll. 1764 (1765), 1766, 1767 respectively”; 1 δ with label: same as above, but lacking last 2 rows; all the paratypes with printed (on red paper), double framed “PARATYPE δ (♀ respectively) [1] ([2-28 respectively] / Erebia cassioides / centrorilica / subsp. nov. / nov. / [line] / Abadjiev det. 2000” (paratypes 1-10, 22-27 in CSAS, paratypes 11, 28 in CIZS, paratypes 12 in MHNG, and paratypes 13-21 in CSBS).

*Etymology:* Toponymical name, compound word derived from “central” and “Rila”.
Fig. 1

Provisional distribution map of Erebia cassioides (Reiner & Hohenwarth, 1792) in Bulgaria.


DESCRIPTION

♂ (Figs 2-3): right forewing length - average 15.5 mm, 15.0 mm in the holotype; wing upperside dark brown with greenish reflection; forewing apex slightly rounded; subapical fulvous-red patch not extending to cell but usually extending to vein 3 and enclosing twin, white-pupilled ocelli; forewing underside brown to fulvous; submarginal line dark brown; postdiscal band dark brown, wide and well-defined in spaces 4-6; postdiscal fascia fulvous, encloses the ocelli; hindwing upperside with fulvous-red postdiscal marks enclosing usually 3 well developed ocelli; underside ground colour silvery-gray finely dotted with brown; submarginal fascia not well defined; postdiscal fascia with usually 2 small ocelli; discal band darker, brown-greyish.

♀ (Figs 6, 8): right forewing length - average 15.5 mm; wing pattern as in male; upperside forewing subapical fulvous-red patch not extending to cell; submarginal line on the forewing underside dark brown and sharpened; postdiscal band clearly visible in spaces 1-3; hindwing underside ground colour lighter.

♂ genitalia (Fig. 10): uncus shorter than tegumen; gnathos slender, curved, shorter than uncus; saccus elongated. vinculum curved; aedoeagus short (but longer than valva), sclerotized in the middle; valvae on the costal part with a big proximal tooth; apically followed by another tooth (smaller than first one); apically valva rounded, usually with 2 small costal teeth; ♂ genitalia are illustrated also in Beshkov (1996: 118: Figs 32 [paratype 16] - 33 [paratype 15]) as “Erebia cassioides macedonica” (Buresch. 1918) [sic].

♀ genitalia (Fig. 13): sterigma with an Y-shaped clape of the lamella antevaginalis, the basis is twisted once ventrally and symmetrically laterally, the part before the furcation large, but equal is size before and after furcation, apex of the Y-shaped clape bifid, both parts of furcation long, forming an U-shaped structure; lamella antevaginalis with 2 lateral lobes, sclerotized, twisted near ostium bursae; ductus bursae short; ostium bursae sclerotized; corpus bursae with 2 longitudinal signa, each one composed by about 30 radial sclerotizations.

Variability: This subspecies is variable in forewing length (13.6-17.0 mm in ♂; 14.5-15.8 mm in ♀). Instead of the usual subapical fulvous-red patch extension to vein 3 in 1/3 of the males a small fulvous-red patch also present in space 2; in half of the females the subapical fulvous-red extends to vein 1. In 21% of the males ocelli number on the hindwing upperside is 4. The postdiscal fascia on the hindwing underside in 11% of the males is with 1 ocellus; in additional 4% with 3 ocelli.

Differential diagnosis: E. cassioides centrotilica ssp. nov. can be distinguished from its nearest relatives by the following differential features: forewing (especially in ♂) is not pointed as in kinoshitai; ocellation is not so strongly developed as in illyrica and illyronacedonica: dark brown postdiscal band on the underside of the forewing in ♂ wider and better-defined in spaces 4-6 than in macedonica (cf. Figs 3 and 5); submarginal line on the underside of the forewing in ♂ sharpened (Fig. 8). in macedonica usually blurred (Fig. 9); postdiscal band on the underside of the forewing in ♀ clearly visible in spaces 1-3, a feature usually absent in macedonica; “Uncus/
(2) E. cassioides centrorilica ssp. n., holotype δ, underside. Bulgaria: Rila Mts: Suha Vapa: 2450 m: 13.VIII.1998: S. Abadjiev leg. (MHNG); (3) same, paratype δ [28], underside. Bulgaria: Rila Mts: Tcherm Ridge: 2400 m: 24.VII.2000: S. Aadjiev leg. (CIZS); (4) E. cassioides macedonica Buresch, 1918, syntype δ, underside. Bulgaria: Pirin Mts: Popovo Ezero: 2400 m: 16.VII.1915: I. Buresch leg. (NMNH); (5) same, underside; (6) E. cassioides centrorilica ssp. n., paratype ♀ [10], underside, same data as in holotype (CSAS); (7) E. cassioides macedonica Buresch, 1918 ♀, underside. Bulgaria. Pirin Mts: Kamenittsa Circus: 21.VII.1982: A. Slivov leg. (CIZS); (8) same as Fig. 6, underside; (9) same as Fig. 7, underside. Scale lines: 10 mm.

Subuncus-Längenindex” in illyrica and illyromacedonica is 75 (Lorkovic, 1957: 77), in macedonica - 75, in kinoshitai - 55, in centvorilica ssp. nov. - 65: “Höhenindex des dorsalen Valvenvorsprungs” in illyrica is 10, in illyromacedonica - 13 (Lorkovic, 1957: 76), in macedonica - 10, in kinoshitai 16, in centvorilica ssp. nov. - 17; the difference in size of the first 2 costal teeth is better-developed in kinoshitai and macedonica (Figs 11, 12); apically valva is more rounded than in kinoshitai; it bears 2 small apical teeth (Fig. 10), in macedonica - usually 1 (Fig. 11); Y-shaped clape of
lamella antevaginalis is with long part before the furcation in *kinoshitai*; the 2 parts are equal in size in *centrorilica* ssp. nov; the part after furcation forms a V-shaped structure in *macedonica*, rather than the U-shaped in *centrorilica* ssp. n. and *kinoshitai*.

**DISTRIBUTION**

The new subspecies is an endemic of Rila Mountains, Bulgaria. The colonies known are located at an altitude of 2180-2700 m. For exact localities see text explanation of Fig. 1.

**BIONOMICS**


*Habitat*: Reported as “... observed flying in scree formations often along the alpine lakes” (Abadjiev, 1993: 55: “Erebia cassioides macedonica Buresch, 1918”). The biotope on the slope of Tcherni Ridge is illustrated in Abadjiev (1995: Pl. II: Fig. 2: “Erebia cassioides macedonica”): represents a scree with SW exposition. Similar is the habitat at the type locality Suha Vapa, where *centrorilica* ssp. n. flies on the SW rocky slope of the peak (which exactly forms a NE side of the circus of Yakoruda Lakes).

*Larval hostplant and immature stages*: Unknown.

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**REFERENCES**


