

***Rubrapterus bavius* (Eversmann, 1832), a butterfly genus and species new to Bulgaria (Insecta, Lepidoptera, Lycaenidae)**

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Abstract. *Rubrapterus bavius* (Eversmann, 1832), a steppe specialist of conservation concern in Europe, is reported from Sakar Mts. in Bulgaria: the first Bulgarian record of this species and of genus *Rubrapterus* Korshunov, 1987. The reported population has a remarkably late flight time and appears to be trophically connected to *Salvia pratensis* Linnaeus, 1753, not yet recorded as a larval host-plant of *R. bavius* in the wild.

Key words: *Rubrapterus, bavius*, Bulgaria.

Introduction

The butterfly *Rubrapterus bavius* (Eversmann, 1832) occurs in the steppes of South-eastern Europe and Western Asia. Its only congener, *R. fatma* (Oberthür, 1890), occurs in Northern Africa (Coutsis 2008). *Rubrapterus* Korshunov, 1987 is usually placed within genus *Pseudophilotes* Beuret, 1958 but molecular analysis shows that these sister taxa are much more diverged from each other than most other well-established sister genera within that section of Lycaenidae (Ugelvig *et al.* 2011). This supports the status of *Rubrapterus* as a distinct genus, as originally described.

The larvae of *R. bavius* feed on flowers of *Salvia* (Lamiaceae): so far, *S. nutans* Linnaeus, 1753 (König 1992), *S. verbenaca* Linnaeus, 1753 (Tolman 1992), *S. palaestina* Bentham, 1835 (ten Hagen 1996), *S. officinalis* Linnaeus, 1753 (Tolman 1997), *S. nemorosa* Linnaeus, 1762 (Budashkin 2003; Tikhonov *et al.* 2017), and *S. canescens* C.A. Meyer, 1831 (Tikhonov *et al.* 2017) have been recorded in the wild. *R. bavius* is monovoltine; the adults fly for 4-7 weeks from mid-April till mid-May (Crişan *et al.* 2011) or early June (Budashkin 2003), locally even until early July (Pamperis 2009; Tikhonov *et al.* 2017).

In the EU, *R. bavius* is known only from Greece and Romania where is locally threatened by overgrazing (Tolman 1992) or overgrowing (Crişan *et al.* 2011) and is listed on Annexes II and IV of the Habitats Directive 92/43/EEC. The Romanian range of *R. bavius* has generated expectations that it should occur in North-eastern Bulgaria (Abadjiev & Beshkov 2007; Dincă *et al.* 2011), but targeted search there has been futile (Beshkov 2011; pers. observ. 2009-2017). My search for the species in Bulgaria has been more extensive, considering records from neighboring states and the occurrence of recorded host-plants (Assyov *et al.* 2012) in Bulgaria. Since 2009, I have surveyed a total of 54 calcareous sites with various *Salvia* spp. at altitudes up to 1000 m across Bulgaria (Fig. 1).



Fig. 1. 1 - Records of *Rubrapterus bavius* in the Balkan Peninsula and adjacent regions. Triangles: personally surveyed localities (2009-2017). Solid black dots: confirmed records; white, black-centered dots: old and/or unconfirmed records (after Akimov 2009; Dincă *et al.* 2011; HabiProt 2017; Hesselbarth *et al.* 1995; Kovanci *et al.* 2009; Pamperis 2009; Savchuk 2017; Švara *et al.* 2016; Székely 2008; Székely 2016; Verovnik 2012), red dot: first Bulgarian record (Sakar Mts.) (Map: Google Earth®). 2 - Upperside, 3 - underside (Fig. 3) of *R. bavius* ♂, Sakar Mts., 12.06.2017, photos: Z. Kolev.

Results and Discussion

In May 2017, as a member of a biological expedition I visited the small Sakar Mts. (maximum altitude 856 m) in South-eastern Bulgaria. On 13.05.2017, in the foothills outside Topolovgrad at below 360 m a.s.l., I located a population of *Salvia nutans* on ca. 2700 m², with ca. 200 plants in full bloom, but found no *R. bavius*. By 12.06.2017, *S. nutans* had ceased flowering but another congener, *Salvia pratensis* Linnaeus, 1753 (R. Vassilev det.), was in full flower. The latter species, widespread in Bulgaria up to 1000 m a.s.l. (Assyov *et al.* 2012), was abundant in woodland glades and ruderal habitats (roadsides and verges of cultivated land) in the visited region. I surveyed a continuous area of ca. 4.9 ha containing mostly *S. pratensis* at varying densities as well as single flowering specimens of *Salvia sclarea* Linnaeus, 1753.

My repeated visits to the area produced a total of three specimens of *Rubrapterus bavius*: 1 ♂ on 12.06.2017 (Fig. 1: 2, 3), 1 ♀ on 21.06.2017, and 1 ♂ on 22.06.2017. They correspond well to the subspecies *Rubrapterus bavius egea* (Herrich-Schäffer, [1852]) which ranges from North-eastern Turkey to the Western Balkans (Hesselbarth *et al.* 1995) except the Peloponnese (Coutsis 2008). All specimens are very fresh which, considering the lack of adults in mid-May and the warm climate of the region, indicates a very late flight period. No specimens were observed on 20.07.2017. All observations were within 2 m of a *S. pratensis* plant; none were within less than 40 m of the other recorded *Salvia* species. Thus, *S. pratensis* is inferred to be the larval host-plant of *R. bavius* here. All butterflies were found within a patch of ca. 500 m² which was not isolated in any perceivable way from the remaining area with a similar abundance of *S. pratensis*. This agrees with observations on the puzzlingly erratic localisation of *R. bavius* populations within a seemingly uniform habitat in Greece (Tolman 1992), and suggests that the availability of a larval host-plant is not the primary limiting factor for the occurrence of the butterfly. My survey indicates that the population is very small and, given the apparently limited breeding habitat, is probably of conservation concern.

The first definitively proven population of *Rubrapterus bavius* in Bulgaria is remarkable for several reasons. It is far from where the species has been expected to occur in Bulgaria, being ca. 250 km from the nearest Romanian populations (Dincă *et al.* 2011; Székely 2008; Székely 2016). The new locality is also very dissimilar in its climate, which is mild, sub-Mediterranean in Sakar vs. cold, temperate continental in South-eastern Romania. This population is even farther, ca. 300 km, from the nearest populations in Turkey (Kovanci *et al.* 2009). The newly reported locality thus fills a significant gap between the previously known Balkan and Turkish populations of *R. bavius*. Significant new biological data are:

1. the observed close spatial and temporal association of *R. bavius* with, and inferred trophic connection to, *Salvia pratensis* which has not been reported as a larval host in nature despite being accepted by larvae of *R. bavius* in captivity (ten Hagen 1996); and

2. the remarkably late flight period (from the second decade of June till mid-July, based on the limited available observations) under climatic conditions where the butterfly might be expected to fly much earlier.

R. bavius is listed on Annexes II and IV of the Habitats Directive; moreover, the small size of the so far unique confirmed population and the limited area of its habitat indicate that this species has a high conservation priority in Bulgaria. This invites further research for formulating and implementing appropriate conservation measures.

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