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On the occurrences of *Euryommatus berytensis* (Marseul, 1868) and *E. mariae* Roger, 1856 (Coleoptera: Curculionidae: Conoderinae) in the western Palaearctic, and further considerations on the host plant of *E. berytensis*

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Abstract

After first records of a second species of the genus *Euryommatus* Roger, 1856 from Turkey, *E. berytensis* (Marseul, 1868), further specimens could be assigned to that species. *Euryommatus berytensis* and *E. mariae* are compared, and their occurrences are briefly presented. Further details and considerations on the association of *E. berytensis* with the tree *Liquidambar orientalis* Mill., 1768 (Hamamelidaceae) are given.

Key words: *Euryommatus berytensis*, *Euryommatus mariae*, records, faunistics, morphology, species recognition

Introduction

Among the eight species of the genus *Euryommatus* Roger, 1856, which are distributed from Turkey (Asia Minor) and the Arabian Peninsula to East Asia (Lyal 2013; Alonso-Zarazaga *et al.* 2017), only two reach Europe in the West. Recently Gosik *et al.* (2021) presented thrilling details on the biology and on the ecological demands of *E. mariae*, which lives saproxylophagous in the twigs of the Norway spruce (*Picea abies* (L.) H. Karst.), a host plant which had already been supposed a long time ago by Sartorius (1861). Other conifers may be accepted too, as *Pinus sylvestris* L. (Legalov in Gosik *et al.* 2021) or *Pinus mugo* Turra (Fuchs & Bussler 2014). Arnol'di *et al.* (1965) included this species in the key to weevils from European Russia as associated with *Abies* without precise data. Dedyukhin (2012) has found a single specimen near a recently logged *Abies sibirica* Ledeb. tree in Udmurtia (middle Volga basin, easternmost European Russia). L. Egorov *et al.* (2018) collected this species in numbers in the Chuvash Republic (middle Volga basin) with Flight Intercept Traps in a forest where *P. abies* was the only conifer; they also collected *E. mariae* in the adjacent Mordovia in a forest with *Picea abies* and *Pinus sylvestris*. Opanassenko (1976) reports the larval development of *E. mariae* under bark of *A. sibirica* based on two specimens from Novosibirsk Province and Altai. A. Egorov and Zherichin (in Egorov *et al.* 1996) recorded *E. mariae* from *Abies* and, more seldom, also from *Larix*.

Only scarce records of *E. mariae* became public in the western Palaearctic: those from Germany, Austria, Poland (type locality), Latvia, Slovenia and the European part of Russia (Arnol'di *et al.* 1965; Dedyukhin 2012; Alonso-Zarazaga *et al.* 2017; Egorov *et al.* 2018; Egorov 2019; Gosik *et al.* 2021). In Asia, the species is known from Eastern Kazakhstan (Egorov *et al.* 1996), West Siberia: Altai (Opanassenko & Kononenko 1966), East Siberia and the southern Russian Far East (Egorov *et al.* 1996), North Korea (Hong *et al.* 2001) and Japan (Kojima & Morimoto 2004).

The other species, *E. berytensis* (Marseul, 1868), was described based on a specimen from Beirut in the new monotypical genus *Zygopsides* Marseul, 1868 (synonymized with *Euryommatus* by Kirsch (1873)). This species was mentioned by Cebeci & Korotyayev (2019) for the first time from Turkey based on records from 2009 in Muğla

Province and a specimen from Fethiye, which was already caught in 1966. Furthermore, Alziar (2021) indicated *E. berytensis* in an additional note to the fauna of Curculionoidea of Cyprus, whereas in his catalogue, this species remained undetermined (Alziar 2017). Also, Germann & Lienemann (2021) recorded another specimen from Cyprus erroneously under *E. mariae*, which is corrected in this present contribution.

Euryommatus berytensis develops in the wood of *Liquidambar orientalis* Miller (Hamamelidaceae), Oriental Sweetgum, a tree commercially used to produce Styrax (or Storax) (Cebeci & Korotyaev 2019). The weevil can be found on standing trees, but also running quickly in the sunlight on logs of cut *Liquidambar* trees (P. Ponek, pers. observations; Fig. 1).



Figure 1. Habitat of *Euryommatus berytensis* in Turkey at Toparlar, logs of *Liquidambar* in the sunshine in a riparian forest. In this locality 18 specimens were collected on these logs and many more observed running, flying and copulating (photo: P. Ponek).

The taxonomic placement of *E. berytensis* is problematic. The genus *Euryommatus* based on its most recent concept is primarily a catalogue entity: no taxonomic analysis of its composition has been undertaken. While preparing the short communication on the record of *E. berytensis* in southwestern Turkey, B. A. Korotyaev had a photo of the type of *E. dentatipes* (Pic, 1894) from Yemen, kindly sent by Dr. H. Perrin, depicting a weevil quite distinct from its presumed congeners and belonging apparently to a genus from tropical Africa. Unfortunately, neither of the two *Euryommatus* species described from Japan and recorded for the Russian Far East in Egorov *et al.* (1996) are represented in the ZIN collection and thus this issue cannot be discussed nor decided here. However, the database of the weevils of Japan (Kojima & Morimoto 2004) provides images of all species except for *E. japonicus* (Hustache, 1921), which do not fit with *E. berytensis*.

The distinctive characters of the male and female postabdomen of *E. mariae* reported and illustrated by Gosik *et al.* (2021), its association with the boreal conifers and the corresponding distribution imply its rather remote affinity to the southern Palaearctic allies and may favor the placement of the Middle Eastern species in a separate genus, hence the one erected by Marseul, *Zygopsides*, until its affinities are more profoundly understood. This option would provide a monotypical Middle Eastern genus with clear characteristics and would render *Euryommatus* to a less voluminous “magazine” with a more limited East Asian range, and probably also with a narrower host range, as far as details on the host plants are known.

We here compare the two species morphologically, and provide a short overview on the distribution of both species in western Palaearctic.

Material and methods

Abbreviations used: cKL—collection Klaus Lienemann, Krefeld; cCG—collection Christoph Germann, Rubigen; ZIN—collection at the Zoological Institute, Russian Academy of Sciences, St. Petersburg.

Genitalia were macerated in hot KOH, then investigated, photographed and conserved in glycerol. Photos were taken with a VHX-6000 Fotosystem by Keyence at Naturhistorisches Museum Basel (NMB). Additions to localities are written in square brackets. Body length is measured dorsally from anterior margin of the eyes to apex of elytra.

Results

Material examined: The following specimens (spm.) of *Euryommatus mariae* were used for comparison: 1 spm. AUSTRIA. Styria, ex coll. Aug. Schultze, coll. G. Frey (NMB). – 1 spm. Styria/Steiermark [old collection, label with red margin] (NMB). – 2 spms. RUSSIA. Republic of Mordovia, Temnikowsky Distr., 11 km NNW of Temnikov, 54°43'56"N, 43°09'29"E, mixed forest, window trap, 27.VII–6.VIII.2017, leg. L.V. Egorov, G.B. Semishin, ex coll. ZIN (NMB). Ditto of *E. berytensis*: 1 spm. CYPRUS. Platys, (Ni [Nikosia]), 600 m, unter Erlenrinde [under bark on elder], 1.XII.1993, leg. K. Lienemann (cKL). – 10 spms. TURKEY. Mugla Prov., Fethiye-Kargi (SW), 40 m a.s.l., reared from *Liquidambar orientalis* 8–12.VI.2009, leg. H. Cebeci, ex coll. ZIN (NMB); – 2 spms. Toparlar, bord route [roadside] 400, 36°59'32.0"N, 28°39'14.6"E, 9 m a.s.l., 17.V.2005, leg. P. Ponek (cCG).

The comparison of available specimens of *E. berytensis* from Turkey and Cyprus (from collections P. Ponek, ZIN and K. Lienemann) with those of *E. mariae* (collections ZIN and NMB) allowed a separation of the species by the following characters (Length/Breadth):

- different size: 4.1–5.5 mm in *E. berytensis* versus 3.3–4.0 mm in *E. mariae*;
- body coloration: *E. berytensis* has brown elytra while *E. mariae* blackish (Figs 3A–3B vs. 3C–3D);
- width of the elytra: *E. berytensis* (L/B: 1.1–1.2) compared to *E. mariae* (L/B: 1.3–1.5);
- elytron (in lateral view): disc flattened just behind scutellum in *E. berytensis* (Fig. 3B), versus faintly bowed around disc in *E. mariae* (Fig. 3D);
- apex of the elytra: subtruncate dorsally in *E. berytensis* (Fig. 3A), versus rounded in *E. mariae* (Fig. 3C);
- penis: broadened near apex, shovel-shaped in *E. berytensis* (Fig. 2E), versus narrow near apex, elongate-rhomboid in *E. mariae* (Fig. 2J);
- female tergite VIII: wide at base in *E. berytensis* (Fig. 2A), versus narrow in *E. mariae* (Fig. 2F);
- female sternite VIII: with plate widened shortly after its middle, fork with sharper angle (15–20°) in *E. berytensis* (Fig. 2D), versus widened in last third, fork with less sharp angle (40–45°) in *E. mariae* (Fig. 2I).

Regarding the patterns of hairs on pronotum and elytra, both species show similar ones, with two lateral bandings along the disc of pronotum, along the middle just before the scutellum, a stripe on the sutural margin of the elytra just behind the scutellum, and along the last one-sixth along the suture just at the apex.

In a former article Germann & Linnemann (2021) claimed that no relevant differences between the seemingly recorded *E. mariae* (actually *E. berytensis*) and *E. mariae* were detectable. Thanks to availability of small series of specimens of both species, which could be used for a detailed comparison, this statement could be revised, and is corrected here. Thus, the valid distribution of both species in the western part of the Palaearctic is presented in Figure 4.



Figure 2. Genitalia of *Euryommatus* spp. **A–E:** *E. berytensis*: **A**, female tergite VIII; **B**, ovipositor; **C**, spermatheca; **D**, female sternite VIII; **E**, penis. **F–J:** *E. mariae*: **F**, female tergite VIII; **G**, ovipositor; **H**, spermatheca; **I**, female sternite VIII; **J**, penis. (photos: C. Germann).

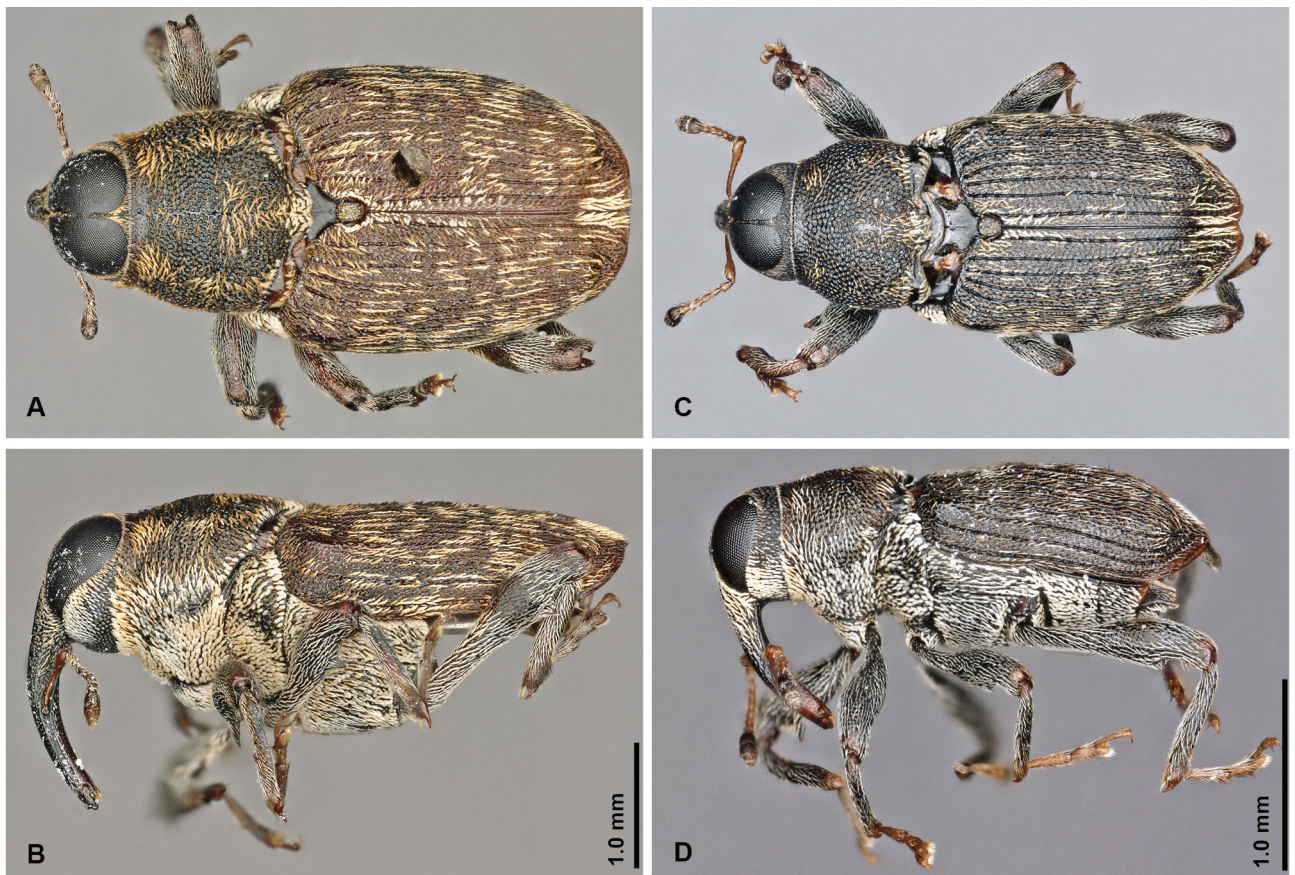


Figure 3. Dorsal and lateral habitus of females of *Euryommatus* species. **A–B,** *E. berytensis* (Marseul, 1868), Platys, Cyprus; **C–D,** *E. mariae* Roger, 1856, Temnikov, Russia. Note the different scale bars (= different sizes) between the species (photos: C. Germann).

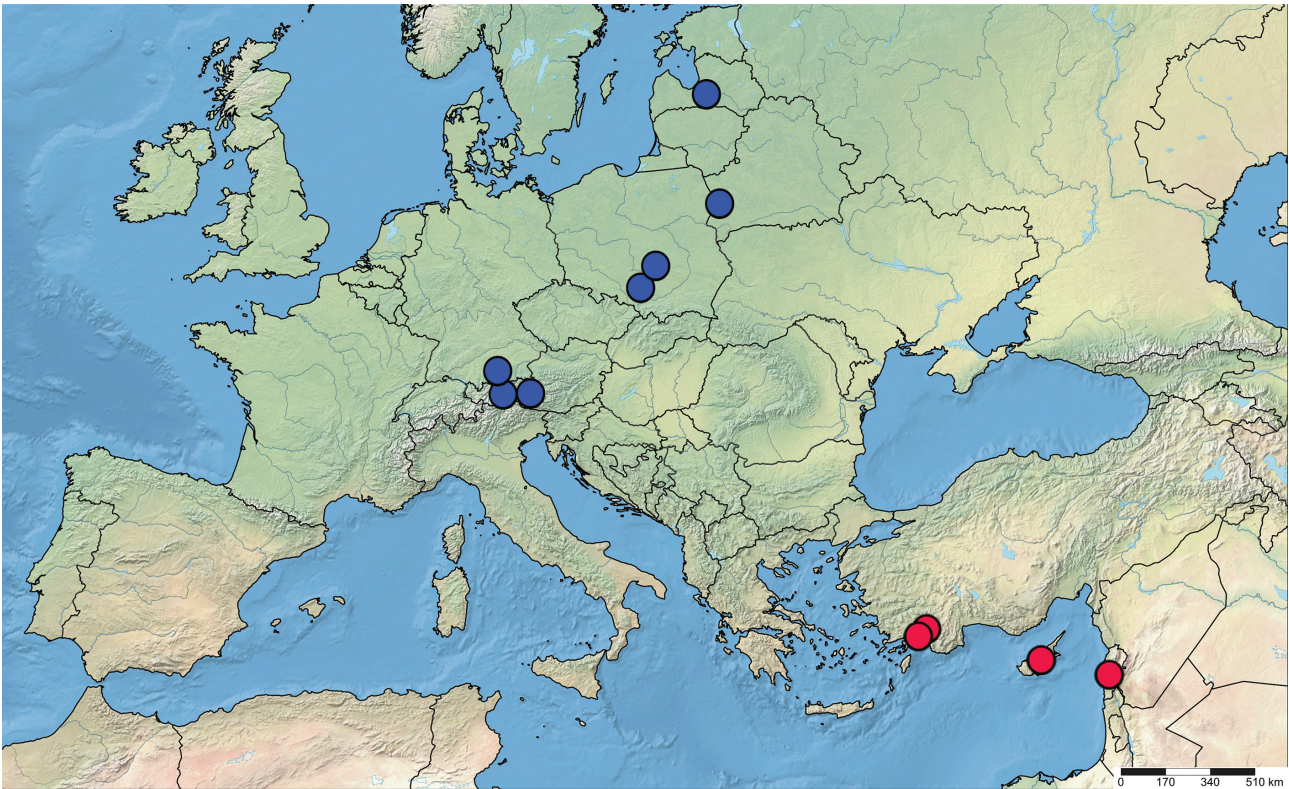


Figure 4. Records of *E. mariae* (blue dots) and *E. berytensis* (red dots) in western Palearctic. Note that *E. mariae* is much more widely distributed in Northern and East Asia including North Korea and Japan (map background www.simplemappr.net).

Discussion

At present two species of *Euryommatus* are known from western Palearctic: *E. mariae* with its westernmost records in Germany and Austria, and *E. berytensis* with records from Cyprus and southwestern Turkey. These species can be differentiated by the characters provided herein, which might prevent further misinterpretations, as both species are still rarely mentioned and depicted in literature at present. It is highly likely that the distribution of *E. berytensis* follows that of its host plant, *Liquidambar orientalis*. This tree is restricted today to south-western Anatolia (provinces of Antalya, Mugla and Denizli). It is introduced and is cultivated on Rhodes and Cyprus (Meikle 1977; Quézel & Médail 2003). *Liquidambar orientalis* with a typical relict distribution (Fig. 5) inhabits warm and wet woodlands along some rivers or in swamps (Efe & Dirik 1992; Akman *et al.* 1993; Quézel & Médail 2003; Öztürk *et al.* 2008).

In this context the discovery of the type specimen of this species in Beirut (Marseul 1868) is surprising since *Liquidambar* is not present in Lebanon today. Unfortunately, the original description of *E. berytensis* is not very informative concerning the finding of the type specimen. Marseul (1868) simply writes: “*Ce charmant insecte, recueilli à Beyrouth, en Syrie (...)*» (at that time, Beirut and Lebanon were part of Syria). It is likely (but not certain) that the type specimen was collected by Ancey (1868), who describes its itinerary and entomological discoveries in Orient in the same issue, same journal, but in this relation Ancey (1868) does not provide any indication concerning the capture of the weevil. However, it should be noted that Ancey (1868) had reported several visits to a river close to the city of Beirut (very likely the Nahr Beirut) and collected beetles in the riverine forest of the estuary: «*Les premiers jours furent naturellement consacrés à explorer les environs mêmes de la ville; j’allais souvent à l’embouchure et sur les bords de la rivière que j’avais aperçue en arrivant (...). En battant les osiers, les saules et autres arbustes qui croissent sur ces rives, je prenais plusieurs espèces (...)*». These ecological conditions correspond well to the ecology of *Liquidambar orientalis*. The riverine forest at the mouth of the Nahr Beirut is clearly indicated on the old map of Beirut, drawn by Löytved (1876), but was progressively destroyed by the expansion of the city.

It is interesting to note that *Liquidambar orientalis* was observed during the 19th century in the lower valley of the Oronte River (near Samandağ in Turkey) (Fig. 5), its easternmost outpost known, but the tree is now extinct here (Browicz 1983; Amigues 2007). Hence the ancient occurrence of this tree near Beirut 250 km in the south cannot be ruled out.



Figure 5. Natural distribution of *Liquidambar orientalis* Mill. from Browicz (1982), map n°66, in Amigues (2007) reworked with QGIS 3.30.1-s-Hertogenbosch and Natural Earth. CRS EPSG 4326. The red star shows an ancient occurrence.

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