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Redescription of the Little Known Galerucine, *Calomicrus malkini* Warchalowski, 1991 (Coleoptera: Chrysomelidae), with Notes on Its Habitat and Host Plants

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ABSTRACT

Calomicrus malkini Warchalowski, 1991 (Coleoptera: Chrysomelidae), a flavous galerucine hitherto known only from Turkey, has been secondly recorded from southern Turkey since its first description in 1991. A large population of the beetles, primarily dominated by females, was collected from *Pistacia terebinthus* L. (Anacardiaceae) and *Quercus cerris* L. (Fagaceae). The species is redescribed together with notes on its habitat and host plants.

Key words: Coleoptera, Chrysomelidae, Galerucinae, *Calomicrus malkini*, redescription, host plant, Turkey.

INTRODUCTION

The genus *Calomicrus* Stephens, 1831 is a member of Luperini tribe and comprises about 35 species in the West Palaearctic Region according to the recent contributions and taxonomical changes (Warchalowski, 2003; Lopatin & Nesterova, 2006; Bezdek, 2006, 2007). Up to now, 8 *Calomicrus* species are known to occur in Turkey including *C. circumfusus* (Marsham, 1802), *C. pinicola* (Duftschmid, 1825), *C. lividus* (Joannis, 1865), *C. chevrolati* (Joannis, 1866), *C. apicalis* Demaison, 1891, *C. syriacus* (Weise, 1899), *C. angorensis* (Pic, 1912) and *C. malkini* Warchalowski, 1991 (Aslan *et al*., 2000; Warchalowski, 1991, 2003).

Calomicrus differs from its closest relatives by having the third antennomere as long as the second, by its open fore coxal cavities, and by the abdomen lacking any characteristical particularities (Warchalowski, 2003). Warchalowski (2003) separates the *Calomicrus* species in two distinct groups; i) the completely pale species, ii) others with at least frons and vertex black. The uppermost light-coloured *Calomicrus* species

were reviewed by Warchalowski (1991), and *Calomicrus malkini* was described as new species from Turkey in the same paper. This was a rather brief description including illustrations of aedeagus and spermatheca. The specimens were collected by Borys Malkin in 1981 (ten years before the original description) from Kaş (Antalya) and then, the species went unrecorded till the present paper.

During the chrysomelid survey in Isparta province (southern Turkey) in 2006, we came across a large beetle population belonging to the genus *Calomicrus*. After the dissection and preparation process of the samples we decided that they were specimens of *C. malkini* based on the characteristic genital features. As far as we are aware, *C. malkini* had not been reported outside its type locality since its original description. So, the aim of this study is to present a detailed redescription of *C. malkini* which seems to be endemic to Turkey, to provide new taxonomical and geographical data about this little known, interesting species, and to complete the lacking information on its habitat and host plants.

MATERIAL AND METHODS

This study was based on 487 specimens (5 males, 482 females) of *C. malkini* collected from Aşağı Gökdere province (30°27'E, 37°52'N), situated 35 km south of the city of Isparta (southern Turkey), in 2006 and 2007. Samples were collected in considerable numbers from the host plants by beating the branches. Habitus and genitalia were photographed with a Camedia C-5060 digital camera attached to an Olympus SZ61 stereomicroscope. For the measurements, the average values obtained from specimens of each sex including the largest and smallest ones were used. All specimens are deposited at the Department of Biology, Faculty of Arts and Sciences, Süleyman Demirel University, Isparta, Turkey.

RESULTS

Calomicrus malkini Warchalowski, 1991, (Fig. 1A-E)

Material examined: SW Turkey, Isparta, Aşağı Gökdere (30°27'E, 37°52'N), 380 m, 06.06.2006, 203 females; 17.06.2006, 158 females; 23.06.2007, 5 males, 121 females.

Redescription of the male

Length about 3.1-3.3 mm. Body slender, elongated. Upperside entirely pale yellowish, shining. Metasternum and abdomen black. Habitus and general colouration as in Fig. 1A.

Head: Brownish yellow, darker and narrower than pronotum with eyes combined. Eyes large, maximal width of head across the eyes 0.51 mm. Posterior surface smooth and impunctate; antennal callus distinct; frontal tubercles convex. Antennae flat, pubescent; first five antennal segments light yellow, others gradually darker. Proportions of antennal segments as: 15:10:12:14:14:14:14:14:14:13:14. Clypeus and labrum light brown covered with some sparse, long and white setae; mandibles basally dark brown, apically black; maxillary palps light-coloured.

Pronotum: Pale fulvous, trapezoidal; basal margin slightly narrower than anterior margin, lateral margins well defined with some small short setae near front angles. Maximum width 1.02 mm, maximum length 0.71 mm; about 1.4 times as wide as long. Surface of pronotum smooth, shining, with a dark, transverse plot in some specimens due to reflection of the colour of the head.

Scutellum: Yellowish brown, triangular, smooth, impunctate.

Elytra: Pale yellowish with glittery shining, almost parallel, rounded at apical part. Maximum width 1.3 mm, maximum length 2.3 mm; about 3.3 times as long as pronotum. Elytral base clearly wider than that of pronotum. Humeral calli even. Elytral surface impunctate, distinctly shagreened, with some scattered short and erect setae remarkable on posterior half.

Venter: Pro-and mesothorax brownish yellow, metathorax and abdomen shiny black with a dense covering of long white setae. Abdominal sternites without any characteristic processes. Last abdominal sternite very slightly emarginated in the posterior margin (Fig. 1B). Legs completely yellow. Claws pseudobifid (inner lobe much smaller than the outer).

Aedeagus: About 1.2 mm in length, quite typical. The tegmen is Y-shaped. In dorsal view nearly parallel-sided, slightly narrowed in the apical third, rounded apically with a small apical tip (Fig. 1C). One third of aedeagus conspicuously sharpened in lateral view (Fig. 1D).

Redescription of the female

Females resemble males except for some small differences noted. Total body length is 3.1-3.8 mm in females. Elytra not covering the abdomen completely, the apical part of the last abdominal tergite visible. Protarsi, especially the first segment, somewhat narrower than that of males. The last abdominal sternite of females is simply rounded, while in the males it is slightly emarginated in the posterior margin.

Spermatheca: Quite characteristic, proximal half brownish-black, distal half yellowish. Ellipsoidal, hook-shaped, narrowed in the middle rounded at apical part with a small bulbous base (Fig. 1E).

Habitat and Host Plant

Large populations of *C. malkini* were collected during June of 2006 and 2007 from a mixed forest dominated by pine-oak-hawthorn located in the south of Isparta province at an elevation of 380 m a.s.l. *Pinus brutia* Ten. formed the dominant species of tree layer, covering nearly 80% of the area. In addition, the forest ecosystem was richly covered with a great variety of native shrubs, and other relatively less abundant tree species. The tree stratum included *Quercus cerris* L., *Q. infectoria* L., *Pistacia terebinthus* L., *Salix* spp., and *Populus* spp. Species included in the shrub layer mainly comprised of *Quercus coccifera* L., *Crataegus monogyna* Jacq., *Cistus creticus* L., and *Rubus canescens* DC. as well as small forms of the above-mentioned trees. The location where the beetles were collected has typical Mediterranean climate features characterized by hot and dry summers and mild and rainy winters. The soil consisted of sandy loam. Mean annual temperature of the area is between 9.6-28.3 ºC, and mean annual precipitation is between 2.0- 236 mm.

Adults of *C. malkini* were found in association with *Pistacia terebinthus* L. (Anacardiaceae), where they nibbled at the leaves, leaving behind plenty of small irregular holes (Fig. 2A). Leaves were seriously injured because of the high population density, but not skeletonized throughout. Beetles consume upper side of leaves with parenchyma while the epidermis of underside stays undamaged. Beetles were also collected from *Quercus cerris* L. (Fagaceae) in considerably large numbers where they were mainly occurred on young and fresh leaves.

DISCUSSION

A review of Galerucinae fauna of Turkey was recently presented by Aslan *et al*. (2000) including 52 species of which five belonging to the genus *Calomicrus*. In the mentioned paper, *C. angorensis*, *C. atrocephalus*, *C. heydeni*, *C. lividus* and *C. pinicola* were reported from Turkey. *C. malkini* and *C. syriacus* were overlooked in this study although they were reported from Turkey in the review paper of Warchalowski (1991) which was based on uppermost light-coloured *Calomicrus* species. In the subsequent papers, *C. circumfusus* and *C. chevrolati* were added to the *Calomicrus* species known from Turkey (Warchalowski, 2003; Gök & Duran, 2004). More recently, in his studies including some taxonomical changes in the tribe Luperini, Bezdìk (2006,

2007) proposed *C. atrocephalus* (Reitter, 1895) as a new synonym of *C. apicalis* Demaison, 1891, and *C. heydeni* (Weise, 1900) as synonym of *C. lividus* (Joannis, 1865). Consequently, as a result of the mentioned cases and nomenclatural changes, Turkish *Calomicrus* fauna includes a total of 8 species at the present time. Among them *C. angorensis* and *C. malkini* seem to be endemic to Turkey for now.

In the original description Warchalowski (1991) did not provide any information on the food plants of *Calomicrus malkini*. Our observation of *C. malkini* feeding on *Pistacia terebinthus* and *Quercus cerris* is the first record for host plant information of the species. In addition, we observed that the species can cause serious damage to *Pistacia terebinthus* by feeding on the parenchyma of the leaf surface, producing a lace-like effect by riddling the leaves with numerous irregular holes (Fig. 2B). The leaves lost their aesthetic beauty, became necrotic and dry after a huge crowd of *C. malkini* specimens feed on them. Although we collected a considerably large number of *C. malkini* specimens from *Quercus cerris*, we could not observe any feeding marks produced by the beetles. It may be a temporary host, or serve as a secondary host plant. Moreover, the species may be polyphagous. Therefore, further observations on the feeding habit of *C. malkini* are required to make a certain expression.

C. malkini was firstly collected from Kaş, Antalya province (Warchalowski, 1991) and secondly, in this study, from Isparta province of Turkey. Its distribution area seems to be restricted to southern Turkey. However, because the eastern and northern parts of Turkey are relatively less visited by entomologist, the species can be distributed more widely. Additional records are needed for investigating exact distributional area of this species in Turkey and other countries included in Mediterranean Basin.

Warchalowski (1991)'s original description was based on 50 specimens of *C. malkini* (holotype, 24 males, and 25 females) out of 153 specimens collected. Interestingly, we collected a total of 487 specimens of which only five were males. This is very probably related with the period of collecting. In numerous species of Chrysomelidae the males perish shortly after copulation, while females enter in the complementary feeding period, oviproduction and oviposition during several weeks (personal communication with A. Warchalowski). So, the very low number of males in the collected material was probably caused by relatively long time expired between copulation of insects.

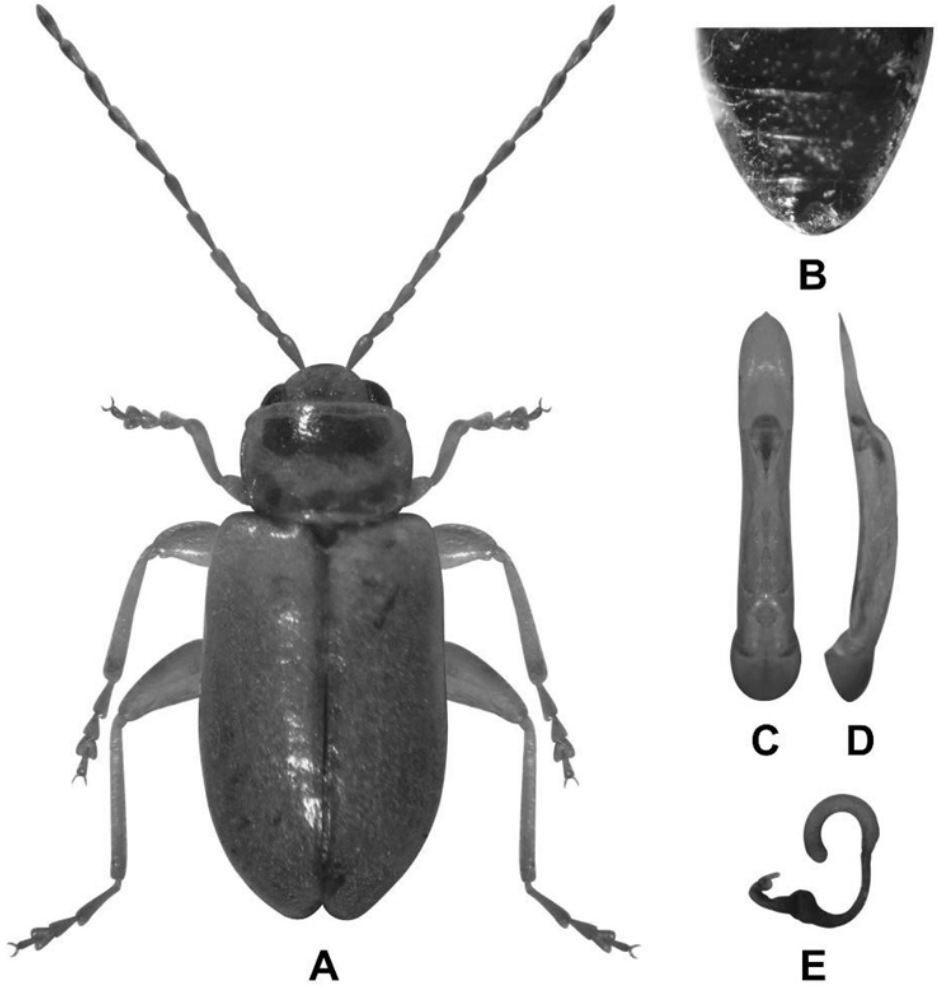

Fig. 1A-E. *Calomicrus malkini* Warchalowski, (A) habitus (male), (B) abdomen of the male showing the emarginated last abdominal sternite, (C) aedeagus dorsal view (D) aedeagus lateral view, (E) spermatheca.

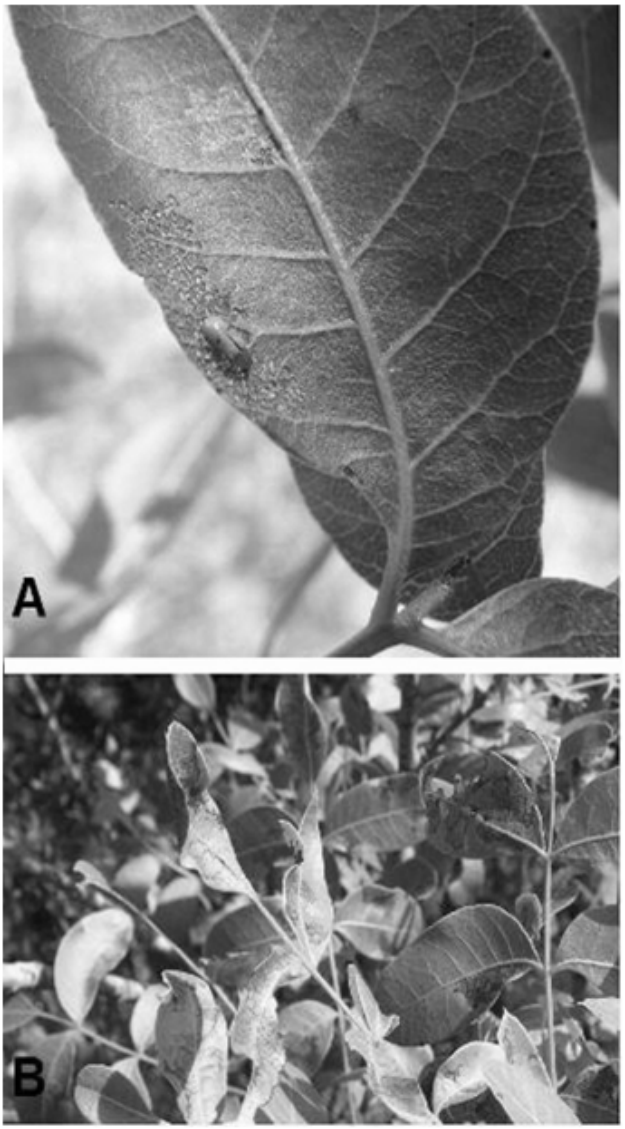

Fig. 2A-B. *Pistacia terebinthus* L., (A) adult *Calomicrus malkini* feeding on the host plant, (B) damaged leaves by the beetles.

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