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NEW COLLECTION RECORDS OF *PERILEPTUS AREOLATUS* (COLEOPTERA: CARABIDAE) FROM THE AMANOS MOUNTAINS OF TURKEY

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ABSTRACT

Specimens from *Perileptus* Schaum, 1860 (Coleoptera: Carabidae) were collected from the Amanos Mountains of Turkey, and this genus was redescribed. Descriptions of *Perileptus* species are presented herein with zoogeographic, biological, and ecological observations. This is the first detailed study of Turkish *Perileptus*, and it provides the first records and information on *Perileptus* from the Amanos Mountains.

Key Words: Amanos Mountains, Anatolian Diagonal *Bembidion*, syrio-exemial faunal elements, *Trechus*

RESUMEN

Se redescribe de *Perileptus* Schaum, 1860 (Coleoptera: Carabidae) con especímenes recolectados de las Montañas Amanos en Turquía. Se presentan descripciones de las especies *Perileptus* con observaciones zoogeográficas, biológicas y ecológicas. Este es el primer estudio detallado de los *Perileptus* de Turquía y se provee los primeros datos e información sobre *Perileptus* de las Montañas Amanos.

Palabras Clave: Montañas Amanos, *Bembidion* Anatolia Diagonal, elementos faunísticos sirio-exemial, *Trechus*

The genus *Perileptus* Schaum, 1860 (Coleoptera: Carabidae) has been placed in the subfamily Trechinae. Most species of this genus have small, flat, and narrow individuals. *Perileptus* is superficially intermediate between *Bembidion* and *Trechus* as evidenced by the moderately reduced terminal segment of the maxillary palp (Lindroth 1985). In addition, the sutural stria is not recurrent at the apex of the elytra, but the frontal furrows are strongly divergent behind the eyes, as in *Trechus* (Lindroth 1985). Beetles in this genus have full wings. Males have 2 dilated segments on both the prothoracic and mesothoracic tarsi (Lindroth, 1985). Adult beetles in this genus have a spine on the outer edge of the anterior margin of the front tibia. Their eyes are pubescent and large. The penultimate labial palpomere has at least 5 setae. The average size of *Perileptus* beetles are less than 2.5 mm, which differs from other genera in this subfamily (Hurka 1996).

The larvae of this genus can be identified by their tarsi, which have 2 equal claws and a pair of flattened apical setae, and by the toothed cutting edge of their mandibles (Luff 1993). Larvae of *Perileptus* species live in fine gravel along the edge of fast flowing streams (Trautner & Geigenmüller 1987; Hurka 1996).

Worldwide, the genus *Perileptus* comprises 57 species and subspecies (Lorenz 1998). According to Hurka (1996), *Perileptus* is distributed mostly in the tropics of the Old World with a single species in Europe. There are 26 species and subspecies known from the Palaearctic region (Löbl & Smetana 2003). Of these, *Perileptus areolatus areolatus* Creutzer is the only species that has been reported from Turkey.

There have been some studies of carabids from the Amanos Mountains (Korell 1988, 2001), but there are no published records of *Perileptus* from this region. The Amanos Mountains encompass a national park that is important not only in Turkey but also worldwide. The Amanos Mountains, which are one of the most tectonic ranges in the world, possess a unique importance because of their geographical position (Okur & Yalçın-Özdilek 2008). These mountains provide a bridge between the Taurus Mountains, Lebanon Mountains, and North Syrian Desert, and allow species belonging to this region to disperse among these areas (Boulos et al. 1994; Okur & Yalçın-Özdilek 2008). The Amanos Mountain range provides a barrier for the distribution of syrio-exemial faunal elements in the west and Mediterranean faunal element in the east (Çıplak et al. 1993; Demirsoy 1996; Uğurtaş et al. 2000). In addition, this mountain range is thought to be a part of the hypothetical Anatolian Diagonal, which possibly affected the faunal structure of Anatolia (Çıplak et al. 1993; Uğurtaş et al. 2000). The Amanos Mountains have rich and diverse fauna and flora because of its geographical position.

This study redescribes the genus *Perileptus* from Turkey, and it provides some zoogeographic, biologi-

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cal, and ecological observations and information about this genus from the Amanos Mountains.

Materials and Methods

Sampling Locations

Perileptus specimens were collected in 2008 and 2010 from 4 locations at different elevations in the Amanos Mountains. Samples were collected by hand from gravelly-stoney river banks:

1. Amanos mountains, Hatay Province, Sinanlı, Karaçay: N 36° 05' 42" E 36° 04' 50", and 33 m asl (Fig. 1).
2. Amanos mountains, Hatay Province, Hassa, Demrek: N 36° 40' 47" E 36° 25' 17", and 458 m asl (Fig. 1).
3. Amanos mountains, Hatay Province, Dörtyol-Kuzuculu-Deliçay: N 36° 53' 21" E 36° 15'17", and 152 m asl.
4. Amanos mountains, Hatay Province, Dörtyol-Payas-Karbeyaz: N 36° 43' 27" E 36° 14' 07", and 249 m asl.

The specimens collected were brought to laboratory, mounted, and identified to species using keys, published descriptions, comparing them with pinned specimens. Measurements were made using a SMZ 1000 Nikon stereobinocular microscope. In addition, photographs of the main diagnostic characters were taken with a Kameram 3.2 camera through the stereomicroscope. Type specimens of the new species were deposited.

Descriptions include details of external features and information about their geographical distribution within the study area, Turkey, and worldwide.

The following abbreviations were used for the measurements, which are given in mm:

HL: length of head from anterior margin of clypeus to posterior margin of temples;

HL(m): length of head from apex of mandibules to posterior margin of temples;

HW: width of head, not including eyes;

HW(e): width of head, including eyes;

PL: length of pronotum along median line;

PW: maximum width of pronotum;

EL: length of elytra from humeral tubercle to the apex;

EW: maximum width of elytra;

BL(a): body length (from head to elytra apex);

BL(b): total body length, from apices of mandibles to those of elytra.

Figures 1 and 2 are displayed in color online in supplementary material for this article in Florida Entomologist 97(4) (December 2014) at http://purl.fcla.edu/fcla/entomoloigist/browse.

Results and Discussion

Genus *Perileptus* Schaum, 1860. [Ganglb., Käf. v. Mitteleur. I., p.185; Bedel, Cat. rais. Col. du Nord de l'Afr. 1896, pp. 82 (Apfelbeck 1904)]. [*Perileptus* Schaum, 1860, pp. 663. Type-species: *Carabus areolatus* Creutzer, 1799. For diagnosis see Jeannel (1926, pp. 402) and Moore (1972, pp. 12) (Baehr 1987)].

Description of *Perileptus areolatus* Creutzer from Turkey (Fig. 2A-D)

Body length (from head to elytra apex) 2.47-2.59 mm, width 0.88-0.92 mm; labrum without an indistinct central tubercle, vertex without punctures, media line strongly conspicuous and reddish-brown, posterior angles slightly protrude, elytra with black spot narrowed from basal to medial at 1st quarter and along apical margin with black spot, elytra color red-brown**.**

Perileptus areolatus Creutzer, 1799. Widespread in the Balkan Peninsula: Bosnia-Herzegovina, frequently on the banks of flowing water streams; Dalmatia (Knin, Castelnuovo, Cattaro), Montenegro (Rjeka-Mustajb.), Serbia (Maidan Kutšajna, Negotin Dol Milanovac Golubac-Merkl.), Bulgaria (Sofia on Iskerflusse-Apflb), Greece (Attica, Thessaly-Krüper; Doris Oertzen-v, dir p 206), and Crete (Zebe). In Asia Minor (Smyrna Krüper, according to V. Bodemeyer anywhere frequently) (Apfelbeck 1904)]. Sometimes seen under pebbles of large streams. Caputured at Smyrna, the Hermon River, the Meandron River, the island of Lesbos, and in the valley of the Alps Bulghar Kara Dagh (Shalberg 1913).

Material Examined

Amanos Mountains, Hatay Province, Hassa, Demrek: 04.VI.2010, 1♀; Amanos Mountains, Hatay Province, Dörtyol-Kuzuculu-Deliçay: 03.VI.2010, 1♂; Hatay-Sinanlı-Karaçay (Orman Ürümleri Deposu): 05.VI.2010, 1♀; Amanos Mountains, Hatay Province, Dörtyol-Payas-Karbeyaz: 06.VI.2009, 2♀♀; 03.VI.2010, 1♀ (4 specimens were damaged when collected).

Description

Measurements (mm): HL: 0.39-0.42; HL(m): 0.55-0.59; HW: 0.42-0.45; HW(e): 0.58-0.62; PL: 0.49-0.53; PW: 0.65-0.70; EL: 1.46-1.51; EW: 0.88-0.92; BL(a): 2.47-2.59; BL(b): 2.63-2.76 (6 specimens measured).

Coloration, from reddish to dark-brown, head reddish-dark brown, antennae red-brown, maxillary palp and labial palp red-brown, mandible red-brown, pronotum from reddish to dark-brown, elytra red-brown, legs red-brown, body ventral from black to dark-brown.

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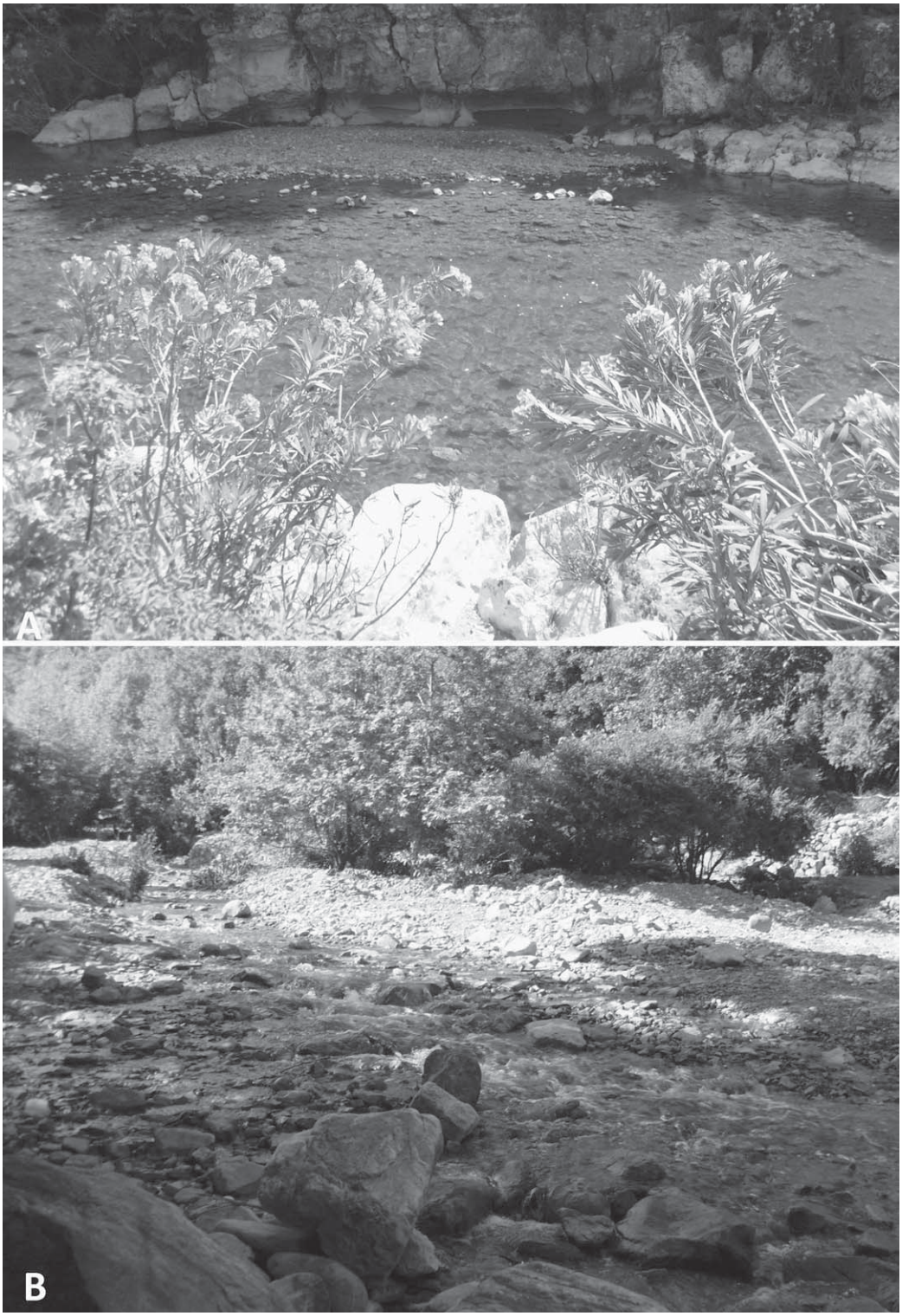


Fig. 1. Collection locations of *Perileptus*; (A) Amanos Mountains, Hatay Province, Sinanlı, Karaçay, and (B) Amanos Mountains, Hatay Province, Hassa, Demrek. This figure is displayed in color online in supplementary material for this article in Florida Entomologist 97(4) (December 2014) at http://purl.fcla.edu/fcla/entomoloigist/browse.

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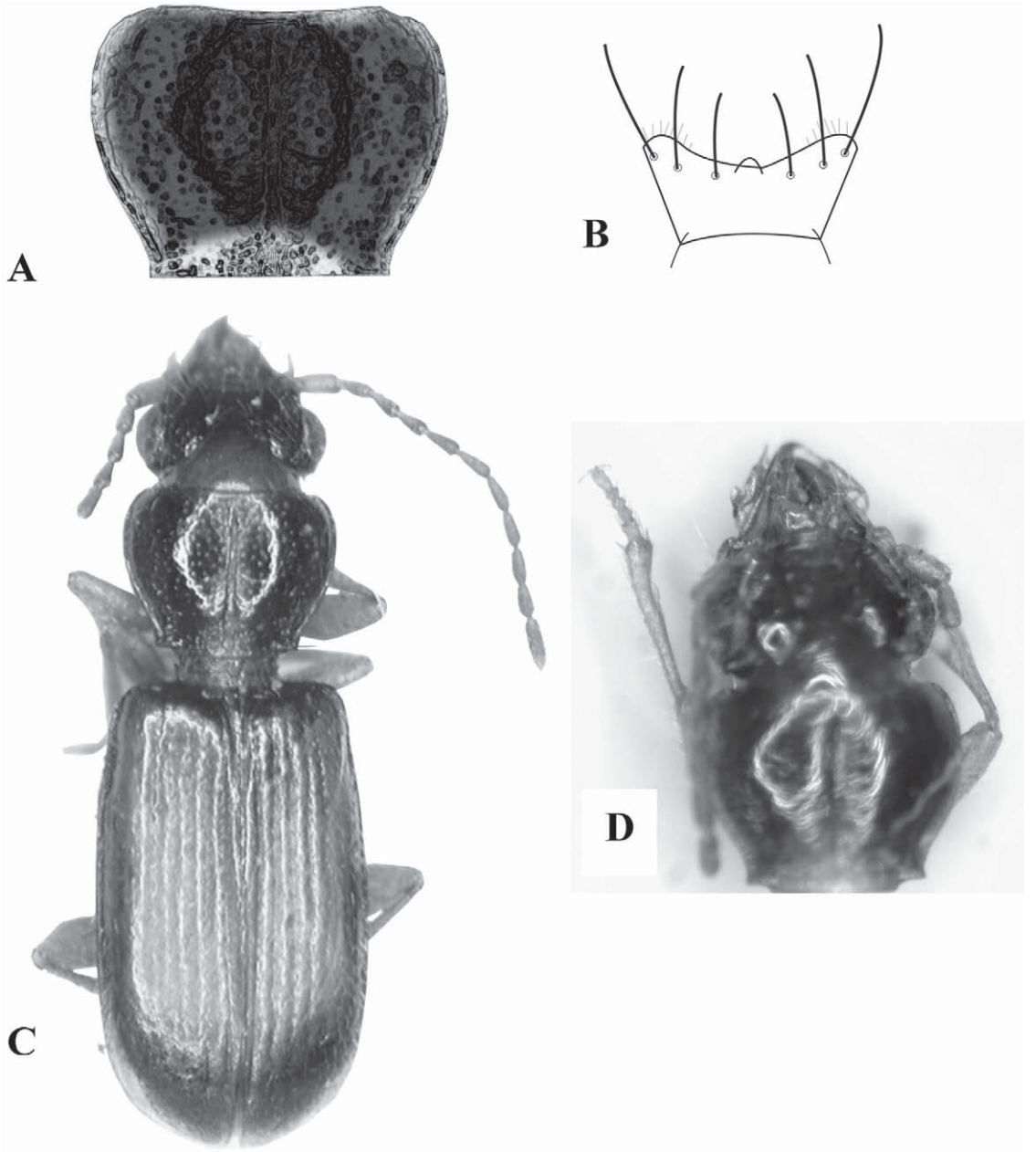


Fig. 2. *Perileptus areolatus* Creutzer, 1799; (A) labrum; (B) pronotum; (C) habitus and dorsal aspect of male, and (D) head and labrum. This figure is displayed in color online in supplementary material for this article in Florida Entomologist 97(4) (December 2014) at http://purl.fcla.edu/fcla/entomoloigist/browse.

Head narrower than pronotum, glabrous, with punctures fine, labrum without an indistinct central tubercle (Fig. 2B), basal like a half moon, with 6 setae in basal marginal, the last segment of maxillary palp and labial palp very thin, mandible strongly large and apex thick, vertex without punctures.

Pronotum (PW/PL: 1.32) (EW/PW: 1.35-1.31) punctures fine and sparsely laying hairs on the marginal sides, with superficial weak microsculpture, anterior margin concave, lateral sides slightly sinuate and margins narrow toward posterior and posterior angles slightly protrude, media line strongly conspicuous and reddish-brown,

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posterior angles with 1 seta, basal depressions slightly marked (Fig. 2A).

Eytra (EL/EW: 1.66-.164) elytra with black spot narrowed from basal to medial at 1st quarter and along apical margin with black spot (Fig. 2C).

Distribution

Asia: Turkey (Anatolia) (Casale & Vigna Taglianti 1999; Löbl & Smetana 2003), Iran, Israel, Saudi Arabia, Syria, Turkey (Löbl & Smetana 2003). Europe (Trautner & Geigenmüller 1987): Bohemia, Moravia, Slovakia (Hurka 1996); Azerbaijan, Albania, Armenia, Austria, Bosnia-Herzegovina, Belarus, Croatia, Czech Republic, France, Great Britain, Germany, Georgia, Greece, Hungary, Ireland, Italy, Latvia, Macedonia, Moldavia, Norway, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, Yugoslavia (Löbl & Smetana 2003). North Africa: Algeria, Morocco, Tunisia (Löbl & Smetana 2003).

Biology and Ecological Notes

The period of reproduction for *P. areolatus* is in late spring, and females with mature eggs have been found in Jun (Lindroth 1985). This species lives in fine sand and pebbles by rivers; and it is known to fly. *Perileptus areolatus* has a primarily southern European distribution, extending as far north as southern Scandinavia (Luff 1998). Although, *P. areolatus* has been described from several countries, including Turkey, this is the first report of specimens from the Amanos Mountains. The specimens were mostly collected in May and Jun at altitudes of 33-458 m. Collections were difficult because these beetles move very quickly.

Acknowledgments

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