RESEARCH PAPER

Three new species and new records of cuckoo bees of the genus *Epeolus* in Turkey (Hymenoptera: Apidae: Nomadinae)

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Abstract. Three new species of cuckoo bees of the genus *Epeolus* Latreille, 1802 are described: *E. turcicus* sp. nov., *E. warnckei* sp. nov., and *E. productuloides* sp. nov., all from the Eastern Anatolia Region of Turkey. Descriptions of *E. turcicus* and *E. warnckei* are based on both sexes whereas the description of *E. productuloides* is based on males only (females of this species are presently unknown). Additional records based on vouchered pinned material are reported for eight species, of which *Epeolus alpinus* Friese, 1893 was until now not known to occur in Turkey. Altogether, 14 species of *Epeolus* have been recorded from Turkey, of which *E. cruciger* (Panzer, 1799), *E. productulus* Bischoff, 1930, *E. schummeli* Schilling, 1849, *E. transitorius* Eversmann, 1852 and *E. variegatus* (Linnaeus, 1758) are widespread and common. *Triepeolus tristis* (Smith, 1854) is the only other member of the tribe Epeolini recorded from Turkey.

Key words. Hymenoptera, Apoidea, Apidae, Epeolini, *Epeolus*, cuckoo bees, distribution, taxonomy, Turkey, Palaearctic Region

Introduction

Cuckoo bees form an ecological group with representatives in three families, Halictidae, Megachilidae, and Apidae, characterized by their cleptoparasitic lifestyle. Female cuckoo bees do not forage or build their own nests but instead lay eggs into the nests of host foraging bee species (BATRA 1984, WESTRICH 1989, MICHENER 2007). Most species of cuckoo bees belong to the family Apidae, in which the subfamily Nomadinae forms the species-rich group in most parts of the world (MICHENER 2007). *Epeolus* Latreille, 1802 represents one of the more speciose genera of cleptoparasitic Nomadinae in the old world (BOGUSCH & HADRAVA, in press). The species and sexes in this genus are very uniform in general appearance, smaller or middle sized (4–9 mm in total body length), and robust with a slightly conical metasoma. Their integument colouration is largely black, although in some species parts of the body are largely red or reddish brown, and all species typically possess bands and spots of white or yellowish tomentum on their body (WESTRICH 1989, ONUFERKO 2017). Bees of the genus *Colletes* Latreille, 1802 are the only known hosts of *Epeolus*, and most species of *Epeolus* are specialized on only one species of *Colletes*; only some usually common and widespread species intrude nests of more *Colletes* hosts (WESTRICH 1989, AMIET et al. 2007, BOGUSCH & HADRAVA, in press).

Bees of the genus *Epeolus* are poorly studied. As is true for many cleptoparasitic bees, they are quite difficult to identify to species, and many species are very rare and localized, so finding them in the field is difficult. Although WARNCKE (1982, 1983) revised all other genera of Palaearctic Nomadinae except *Nomada* Scopoli, 1770, he did not finish his studies on *Epeolus* of the Palaearctic Region. Recently, ONUFERKO (2017) published a revision of Canadian *Epeolus* species, and a revision of the European species of this genus by BOGUSCH & HADRAVA (in press) is expected to be published in the near future. To date, however, no comprehensive study on the bees of this genus from Turkey has been published, and occurrence data for *Epeolus* from
Turkey have been published only in several old faunistic surveys (Popov 1967, Peseenko 1974). Before the present study, it was not known how many species and which species of *Epeolus* occur in Turkey, and how numerous and common they are in the country, which is very rich in bee diversity (see Özbek et al. 2015).

This study is a compilation of *Epeolus* records based on specimens collected in Turkey and recently deposited in museum collections in Europe and Turkey. Warncke’s notes on the distribution of bees of the genus *Epeolus* are also included herein. This is the first overview of bees in this genus from Turkey, with descriptions of three new species from the eastern part of the country in the Anatolian peninsula.

**Materials and methods**

The records are based on personally examined dry, pinned specimens housed in the following collections: BMNH Natural History Museum, London, United Kingdom; JSPC Jakub Straka private collection, Prague, Czech Republic; HOET Hikmet Özbek private collection, Eskisehir, Turkey; MSAA Maximilian Schwarz private collection, Ansfelden, Austria; OLML Oberösterreichisches Landesmuseum, Linz, Austria; PBHC Petr Bogusche private collection, Hradec Králové, Czech Republic.

I have also examined specimens of all species of *Epeolus* known from continental Europe from many collections in Europe and the USA, for which records will be made available upon the publication of the revision of European species (Bogusch & Hadrava, in press). All material was compared to type material of European and Middle-Eastern species.

All localities were visually checked on a map and are presented alphabetically according to province. Descriptions of new species are based on type material. Morphological terms were adopted from Michener (2007) and Rightmyer (2008), and I use the abbreviations T for tergum, S for sternum, and F for flagellum, with corresponding numbers (with 1 being the most basal subdivision and the maximum number being the most apical). Morphology was studied using standard dissecting microscopes and measurement techniques (measuring oculars). Most photos were taken using the camera Canon EOS 550d with macro-objective and LED-light, and focus-stacked in Zerene Stacker. Photos of smaller body parts (the labrum, pygidial plate, and some others) were taken using the Hirox digital microscope. Only type specimens of all species were imaged.

**Descriptions of new species**

*Epeolus turcicus* sp. nov.


**Description. Female.** Size: Body length: 5.1 mm.

**Head.** Length to width ratio = 1.2. Mandible reddish, mandibular apex and preapical tooth darker than rest of mandible. Labrum reddish and sides convex, coarsely and densely punctate, with pair of prominent teeth medially, apex with prominent hair, with pair of lobes separated by medial shallow emargination. Clypeus reddish, not very shiny and with very fine punctuation throughout. Frons to interorbital tubercle reddish, with sparse whitish hair around antennal socket, and with well-developed frontal keel. Vertex with fine and sparse punctures, interspaces shiny and greater than puncture diameters. Antenna dark, only scape, pedicel and F1 completely reddish, F2 reddish basally. Flagellomeres slightly longer than wide (L:W ratio = 1.1), F2 a little longer than other flagellomeres (L:W ratio = 1.15–1.2).

**Mesosoma.** Pronotum reddish and entirely obscured by yellowish tomentum. Mesoscutum black in the middle with dense coarse wax-like punctuation, interspaces much narrower than puncture diameters. Mesoscutum along anterior and posterior margins with yellowish tomentum, well-developed paramedian band and similar band also on each side of mesoscutum. Mesoscutellum reddish, round, densely and very coarsely punctate, punctures bigger than on the mesoscutum, axillary tooth (free portion of axilla) short and acute. Mesoscutum with anterior margin extending over propodeum. Propodeum very finely sculptured, dull, lower part shiny, and laterally with yellowish tomentum. Mesopleuron in upper half black with dense yellowish tomentum, in lower half reddish, sparsely hairy and very coarsely and densely punctate, shiny interspaces narrower than puncture diameters. Wings slightly brownish with dark brown venation. Legs reddish, only basal part of front coxa dark, tibial spur on middle and hind legs black.

**Metasoma.** Metasoma partly reddish (usually basal and lateral parts of sterna and terga). T1 finely and densely punctate, interspaces matt and narrower than puncture diameters. T1 with bands of tomentum connected laterally and separated medially, forming a C-shape on each side. T1 with apical fascia of pale tomentum separated medially by patch of light brown to reddish-brown tomentum. T2–T4 densely but more coarsely punctate with shiny interspaces and ill-developed depressions. T2–T4 with apical bands of yellowish tomentum interrupted medially and narrowed laterally, apical impressed areas semitransparent. T5 shiny with very fine and dense punctuation, black apex and whitish tomentum on sides, pseudopygidial area short, with silver-like pubescence. T6 reddish with slightly curved apex, bearing brownish pygidial plate, which is not very wide, with sparse short yellowish hair. S2 coarsely and sparsely punctate, interspaces much bigger than puncture diameters, especially medially, where punctures are bigger, shallow, and very sparse. Other sterna more finely and densely punctate. S5 curved (see from side) and narrow. Processes on sides of S6 normal, with short projections.

**Male.** Size: Body length: 5.1 mm.

**Head.** Length to width ratio = 1.2. Mandible reddish with mandibular apex and preapical tooth darker than rest of mandible. Labrum reddish and sides convex, coarsely and densely punctate, with pair of prominent teeth medially, apex with prominent hair, with pair of lobes separated by medial shallow emargination. Clypeus black with
reddish narrow apical band, not very shiny and with very fine punctuation throughout, most of clypeus with whitish tomentum. Frons with dense whitish hair around antennal socket, with well-developed frontal keel. Vertex with fine and sparse punctures, interspaces shiny and greater than puncture diameters. Antenna dark, only scape, pedicel and F1–F2 partly reddish. Flagellomeres slightly shorter than wide (L:W ratio = 0.9–0.95), F2–F3 a little longer than other flagellomeres (L:W ratio = 1.15).

**Mesosoma.** Pronotum black, entirely obscured by yellowish tomentum. Mesoscutum black with dense coarse wax-like punctuation, interspaces much narrower than puncture diameters. Mesoscutum along anterior and posterior margins with yellowish tomentum, well-developed paramedian band and similar band also on sides of mesoscutum. Mesoscutellum black, round, densely and very coarsely punctate, punctures bigger than on mesoscutum, axillary tooth short and acute. Mesoscutellum with posterior margin extending over propodeum. Propodeum very finely sculptured, dull, lower part shiny, and laterally with yellowish tomentum. Mesopleuron in upper half with dense yellowish tomentum, in lower half very coarsely and

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Figs 1–9. *Epeolus turcicus* sp. nov. 1 – holotype, ▪, dorsal view; 2 – allotype, □, dorsal view; 3–8 – holotype: 3 – head, frontal view; 4 – labrum; 5 – mesopleuron, lateral view; 6 – mesosoma; 7 – terga; 8 – sterna. 9 – allotype, pygidial plate.
densely punctate, shiny interspaces smaller than puncture diameters. Wings slightly brownish with dark brown veination. Legs reddish, only basal parts of front coxa and middle parts of femora dark, tibial spurs on middle and hind legs black.

Metasoma. Metasomal sternum and terga dark brown or black. T1 finely and densely punctate, interspaces shiny and similar in width to puncture diameters, with yellowish tomentum on whole surface (except basal part). T2–T5 more coarsely punctate than T1, shiny, with interspaces bigger than puncture diameters, and with complete, wide, yellowish apical bands. Depressions of T2–T5 well-developed, semitransparent. T6 with spots of whitish or yellowish tomentum medially. Pygidial plate elongate and reddish, shiny with sparse punctures and dark brown margin. S2 coarsely and sparsely punctate, interspaces much bigger than puncture diameters, especially medially, where punctures are bigger and sparse. Other sternae more finely and densely punctate. S2–S3 with white tomentum on apex, S4–S5 with prominent thick brownish hair on apex.

Differential diagnosis. This species is in the E. variegatus group (with E. compar, E. eriwanensis, E. intermedius, E. productus and E. variegatus), characterized by the presence of labral tubercles positioned in the middle of labrum and curved shape of last metasomal sternum of female (most easily seen in lateral view). It is similar to E. aureovestitus in general appearance, but in E. aureovestitus the female S5 is straight and flagellomeres of both sexes are shorter (female E. aureovestitus L:W ratio = 0.85, female of E. turcicus L:W ratio = 1.15; male E. aureovestitus L:W ratio = 0.6, male E. turcicus L:W ratio = 0.85). In female E. turcicus the labrum, apex of clypeus, mesoscutellum, legs and most of the metasoma are reddish. Apex of labrum has two lobes, but they are less conspicuous than in E. variegatus. The scape, pedicel, and F1 are completely red in the female and partly red in the male. Tometum on whole body is creamy-whitish or pale yellow, T2–T4 with bands of tomentum connected together and forming C-shaped mark on each side. Legs reddish in males with several parts darker. Punctuation very fine, especially on S2 much finer than in E. variegatus.

Pygidial plate of male reddish.

Etymology. The species is known only from localities in Turkey so it was named after this country using the adjective turcicus (-a, -um).

Ecology. Host and floral associations are unknown.

Distribution. Recently known only from three localities in east Anatolia, Bitlis province, near Lake Van, and one specimen was collected near Konya quite far away westwards. It is likely to be more widely distributed in Turkey and probably also in other Middle-Eastern countries.

Epeolus warnckeii sp. nov.


Description. Female. Size: Body length: 5.9 mm.

Head. Length to width ratio = 1.25. Mandible reddish, mandibular apex and preapical tooth darker than rest of mandible. Labrum slightly concave, reddish, coarsely and densely punctate, with two small teeth near apex, apex with prominent hair, only slightly curved. Clypeus reddish, not very shiny and with very fine punctures throughout, basal part of clypeus with white tomentum. Frons with whitish tomentum around antennal socket, and with well-developed frontal keel. Vertex with fine and sparse punctures, interspaces shiny and bigger than puncture diameters, all is hardly visible under sparse yellowish tomentum. Antenna reddish, flagellomeres slightly longer than wide (L:W ratio = 1.05–1.1), F2–F3 longer than other flagellomeres (L:W ratio = 1.15–1.2).

Mesosoma. Pronotum reddish and entirely obscured by creamy whitish tomentum. Mesoscutum black with marginal parts reddish, and with dense coarse punctuation, interspaces usually narrower than puncture diameters, in front and central part of similar size to puncture diameters. Mesoscutum around anterior and posterior margins with creamy whitish tomentum, well-developed paramedian band and similar band also on side of mesoscutum. Mesoscutellum reddish, round, densely and very coarsely punctate, punctures bigger than on mesoscutum. Axillar tooth (free portion of axilla) longer than mesoscutellum and acute. Mesoscutellum with posterior margin extending over propodeum. Propodeum very finely sculptured, dull, lower part shiny with creamy whitish tomentum laterally. Mesopleuron on whole surface with dense whitish tomentum, in lower half reddish and very coarsely and quite densely punctate, shiny interspaces narrower than puncture diameters, small upper part of mesopleuron black. Wings slightly brownish with dark brown venation. Legs reddish, only basal part of front coxa darker, tibial spurs on middle and hind legs yellow.

Metasoma. Whole metasoma reddish. T1 finely and densely punctate, interspaces shiny and narrower than puncture diameters. T1–T2 with band of tomentum connected together and forming C-shaped mark on each side. T1–T2 medially with apical impressed area with light brown or reddish-brown tomentum. T3–T4 densely punctate with shiny interspaces and ill-developed depressions. T3–T4 with apical band of yellowish tomentum interrupted medially, ends of terga semitransparent. T5 shiny with very fine and dense punctuation, with sparse whitish tomentum on whole surface, pseudopygidial area short with silver-like pubescence. T6 reddish with slightly curved apex, bearing reddish and wide pygidial plate with dense short yellowish hair. S2 coarsely and densely punctate, interspaces similar in width to puncture diameters. Other sterna more finely and densely punctate. S5 straight and wide. Processes on sides of S6 normal, with short projections. All sterna with creamy whitish tomentum.

Male. Size. Body length: 5.3 mm.

Head. Length to width ratio = 1.2. Mandible reddish, mandibular apex and preapical tooth darker than rest of mandible. Labrum concave, reddish, coarsely and densely punctate, with two small teeth near apex, apex with prominent hair, only slightly curved. Clypeus black with reddish apex, not very shiny and with very fine punctures throughout, basal part with white tomentum. Frons with whitish tomentum around antennal socket, and with
well-developed frontal keel. Vertex with fine and sparse punctures, interspaces shiny and wider than puncture diameters, all is hardly visible under sparse whitish tomentum. Antenna reddish, scape brown on base. Flagellomeres shorter than wide (L:W ratio = 0.85), F2–F3 longer than other flagellomeres (L:W ratio = 1.1).

Mesosoma. Pronotum entirely obscured by creamy whitish tomentum. Mesoscutum black with sparse and coarse punctation, interspaces usually wider than puncture size, in front and central part similar width to puncture diameters. Mesoscutum black, along anterior and posterior margins with creamy whitish tomentum, well-developed but short paramedian band and similar band also on sides. Mesoscutellum black, round, sparsely and very coarsely punctate, punctures wider than on mesoscutum, axillar tooth (free portion of axilla) longer than mesoscutellum and acute, reddish on apex. Mesoscutellum with posterior margin extending over propodeum. Propodeum very finely sculptured, dull, lower part shiny and laterally with yellowish tomentum. Mesopleuron on whole surface with dense whitish tomentum, in lower half coarsely and densely punctate, shiny interspaces narrower than puncture diameters. Wings slightly brownish with dark brown venation. Legs brownish, only tibiae and tarsi reddish, tibial spurs on middle and hind legs yellow.

Metasoma. T1 finely and densely punctate, interspaces shiny and of similar width to puncture diameters. T1–T2 with band of tomentum connected together and forming C-shaped mark on each side. T1–T2 medially with apical impressed area with light brown or reddish-brown tomentum. T3–T5 densely punctate with shiny interspaces and ill-developed depression. T3–T5 with apical band of yellowish tomentum interrupted medially, ends of terga semitransparent. T6 shiny with very fine and dense punctuation, with sparse whitish tomentum on the whole surface. T7 short and broad, round, reddish, with matt surface with ill-developed fine punctures. S2 quite coarsely and densely punctate, interspaces similar to width of puncture diameters. Other sterna more finely and densely punctate. S1–S3 with white tomentum on apex, S4–S5 with prominent thick brownish hair on apex.

Differential diagnosis. This species is very similar to *E. flavociliatus*, and both species can be distinguished from all other Epeolini in Turkey by the elongate and distinctly hooked axillae. Unlike *E. flavociliatus*, in which the labrum does not have tubercles, *E. warnckei* has well-developed labral tubercles near the apex of the labrum. Punctuation on whole body is much denser and coarser than in *E. flavociliatus*. Most of the body is red in females and with whitish tomentum. Male is black with red legs, scape, pedicel and F1 partly red. Similar is also *E. subrufescens*, but it differs by typical darkened and sclerotized apical tubercles in the middle of mesoscutellum.

Etymology. Both specimens of this species were collected on the same day and at one locality by German specialist Klaus Warncke to whom I dedicate the species.

Ecology. Host and floral associations are unknown.

Distribution. Known from only one male and one female recorded at one locality near Lake Van, east Turkey. This species is probably rare and it is not possible to write anything more about its distribution and occurrence at this time.

*Epeolus productuloides* sp. nov.


Description. **Male.** Size: Body length: 6.3 mm.

Head: Length to width ratio = 1.24. Mandible reddish, mandibular apex and preapical tooth darker than rest of mandible. Labrum reddish and flat, coarsely and densely punctate, with two prominent teeth not in the middle but positioned in 2/3 of the length of clypeus from the base, apex straight with short whitish hair. Clypeus black, not very shiny and with very fine punctation throughout, with whitish tomentum on whole surface. Frons with dense whitish hair around antennal socket, with well-developed
frontal keel. Vertex finely and sparsely punctate, interspaces shiny and wider than puncture diameters, punctuation behind ocelli denser. Antenna light brownish, only scape reddish. Flagellomeres slightly shorter than wide (L:W ratio = 0.9–0.95). F2–F3 equal in length to width.

**Mesosoma.** Pronotum entirely obscured by yellowish tomentum. Mesoscutum black with dense coarse punctation, interspaces of similar width as puncture diameters. Basal part of mesoscutum with yellowish tomentum and very short maculae-like paramedian band. Mesoscutellum black, round, densely and very coarsely punctate, punctures greater than on mesoscutum, axillary tooth (free portion of axilla) short and acute, reddish at the end. Mesoscutellum with posterior margin extending over propodeum. Propodeum very finely sculptured, dull, lower part of propodeum shiny with yellowish tomentum laterally. Mesopleuron in upper half with dense yellowish tomentum, in lower half coarsely and densely punctate, shiny interspaces narrower than puncture diameters. Legs reddish, only basal parts of front coxae dark, tibial spurs on middle and hind legs reddish.

**Metasoma.** T1 finely and densely punctate, interspaces matt and narrower than puncture diameters. T1 with band of tomentum connected together and forming C-shaped mark on each side. T1–T2 medially with apical impressed depression. T2–T4 with two spots of yellowish tomentum laterally and T5 with one spot of yellowish tomentum laterally, depressions well-developed and semitransparent. T6 shiny with very fine and dense punctuation, with sparse whitish tomentum on whole surface. T7 elongate, round, reddish, with matt surface, ill-developed fine punctures and narrow brownish margin. S2 quite coarsely and densely punctate, interspaces similar to width of puncture diameters. Other sterna more finely and densely punctate. S1–S3 with white tomentum on apex, S4–S5 with prominent thick yellowish hair on apex.

**Differential diagnosis.** This species is in the *E. variegatus* group, and is most similar to *E. productulus* because of the tubercles on the labrum positioned not in the middle but nearer to the apex, straight labral apex, shiny mesoscutum and dense punctures on T2. Males of *E. productuloides* differ in that they have very fine and sparse punctuation on the mesosoma contrasting with rough punctuation on the mesosoma, interrupted apical bands of tomentum on T2–T5 and a red pygidial plate. All specimens have a red labrum, antenna and legs (all these structures are completely or partly black or brownish in most specimens of *E. productulus*).

**Etymology.** The species is very similar in morphology and certainly closely related to *E. productulus*. The species epithet is derived using the Greek suffix –oides, meaning ‘resembling’.

**Ecology.** Host and floral associations are unknown.

**Distribution.** Only four males were recorded at two localities in east Turkey. The localities are not far away from each other. However, it is not possible to write anything more about its distribution and occurrence.

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**Occurrence records of other *Epeolus* species in Turkey**

**Epeolus alpinus** Friese, 1893


**Distribution.** Most of North Europe, in Central and Southern Europe known from the biggest mountain ranges: Alps, Pyrenees, and Carpathians (Scheuchl 2000, Amiet et al. 2007). This species is probably not endemic to Europe but likely occurs also in Siberia (Bischoff 1930). Several records are known also from North Africa (Bogusch & Hadrava, in press). **New record for Turkey.**

**Epeolus cruciger** (Panzer, 1799)


**Distribution.** Most of Europe, recent records suggest it is more common in Southern Europe. It also occurs in the Middle East – Turkey, Iran, Caucasus and Siberia (Bogusch & Hadrava, in press). According to these records, this species is distributed throughout most of Turkey and is not rare there.

**Epeolus eriwanensis** Bischoff, 1930


**Distribution.** Rare species occurring in the Middle East, known from Egypt, Turkey, Syria, Armenia, and Iran (Bogusch & Hadrava, in press). Only several records are known from Turkey, where it is not common.

**Epeolus fasciatus** Friese, 1895


**Distribution.** Most of Southern and Central Europe and Russia – Rostov Province (Pesenko 1974). Additional recent records are known from Turkey and the Middle
Epeolus productuloides Bischoff, 1930


Distribution. Most of Southern Europe, reaching Switzerland in the north, but it has recently become extinct there (AMIT et al. 2007). It also occurs in the Middle East (BOGUSCH & HADRAVA, in press). Known from Turkey and probably is not rare there.

Epeolus schumanni Schilling, 1849


Distribution. Most of Pannonian province and several sites in Southern Europe, recorded also from Russia – Rostov Province (PESENKO 1974). This species occurs in Southern and Central Europe and also occurs in Turkey and the Middle East (BOGUSCH & HADRAVA, in press). It is not rare in Turkey compared to Europe.

Epeolus transitorius Eversmann, 1852


Distribution. This species occurs across Southern Europe, reaching North to Central Europe (Hungary, Slovakia) and also in the Middle East and North Africa (known from Cyprus, Turkey, Egypt, Jordan, Syria, and Morocco), Iran (POPÓV 1967), Turkmenistan (BISCHOFF 1930), Uzbekistan (MORAWITZ 1874), and Kazakhstan (BOGUSCH & HADRAVA, in press). It is in some parts of its range quite common and being repeatedly collected, especially in all parts of Southern Europe. In Turkey, it is widespread and locally common.

Epeolus variegatus (Linnaeus, 1758)


Distribution. This species is widely distributed across Europe (SCHUECH 2000, AMIT et al. 2007). Its distribution extends to the Middle East and North Africa, and probably further into Asia. It is the only common and widespread species of this genus across Europe. It is more common in Northern and Central Europe, while in Southern Europe and the Middle East (as well as in Turkey) other species (E. transitorius, E. cruciger, or local endemics) are usually more common.

Discussion

This study presents three species new to science, all recorded from the eastern parts of Turkey. Two of them, Epeolus turchicus sp. nov. and Epeolus warnckeai sp. nov., have been recorded only from the vicinity of Lake Van, near the border with Azerbaijan, Syria, Iraq, and Iran. The third species, Epeolus productuloides sp. nov., is also from this region but another locality about 150 km south. All descriptions are based on specimens collected between 1979 and 1991, so these species are presumed to be extant. They are probably local endemics in the Eastern Anatolia Region, but surveys in neighbouring Azerbaijan, Syria, Iraq, and Iran could confirm or reject this hypothesis.

Epeolus in Turkey is poorly known, and this study is the most comprehensive review of bees of this genus in Turkey to date. Records of occurrence are confirmed and presented for eight species, of which Epeolus alpinus has not been previously recorded from the country. Of these species, Epeolus cruciger, E. productuloides, E. schumanni, E. transitorius and E. variegatus seem to be common and widespread in Turkey. All these species also occur in Europe, where they are more numerous in the Mediterranean Region. Only Epeolus schumanni has recently become very rare in Europe but not Turkey. Three species are newly described. Besides these 11 species, three additional species have been recorded from Turkey in past: Epeolus flavociliatus Friese, 1889, E. laevifrons Bischoff, 1930 and E. subrefescens
Saunders, 1908 (Bischoff 1930, Popov 1967, Bogusch & Hadra, in press). All these species are quite rare within their whole area of occurrence, and I have been unable to find and re-examine material to confirm their presence in Turkey. *Epeolus bischoffi* (Mavromoustakis, 1954) was described in the genus *Oxybiastes* Mavromoustakis, 1954, which has since been synonymized under *Epeolus* (Roig-Alsina & Schwarz 1992). It is known from several countries near Turkey including Cyprus, Jordan, Syria, Lebanon, and Israel (Bogusch & Hadra, in press), so it is possible that this species occurs in the southern parts of Turkey. However, it has not been collected anywhere recently; this species is known only from several mostly older finds. *Triepeolus tristis* (Smith, 1854) is the only other species of Epeolini in the Western Palaearctic Region. This genus is closely related to *Epeolus* and also very similar in appearance. *Triepeolus tristis* is very uncommonly observed or collected in Southern Europe and the Middle East (Bogusch & Hadra, in press).

In summary, in Turkey *Epeolus* is represented by 14 species, an additional species (*E. bischoffi*) is very likely to occur in Turkey, and one species of the related genus *Triepeolus* is also known from Turkey. Additional research done by specialists from Turkey could help to improve our knowledge of these interesting cuckoo bees.

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