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## Contribution to the knowledge of the Oniscidea (Crustacea: Isopoda) fauna of Turkey with a new record: *Schizidium davidi* (Dolfuss, 1887)

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### Abstract

This study was carried out between 2013 and 2014 in Elazığ Province in Eastern Turkey. A total of six species determined from the material collected during the course of this study: *Trachelipus squamuliger* (Verhoeff, 1907), *Schizidium davidi* (Dolfuss, 1887), *Porcellionides depressiorum* (Verhoeff, 1943), *Ligidium tauricum* Verhoeff, 1943, *Parcylisticus pugionifer* Verhoeff, 1943 and *Protracheoniscus marmaranus* Verhoeff, 1941 All except for *P. depressiorum* and *Parcylisticus pugionifer* are first records for Elazığ province, while *Schizidium davidi* (Dolfuss, 1887) is first record for the Oniscidean fauna of Turkey

**Keywords:** *Oniscidae*, Isopoda, Elazığ, Turkey, New record, *Schizidium davidi*

### Introduction

Among 34 biodiversity gene centres globally, Eastern Anatolia is situated at the junction of three biodiversity gene centres: Caucasus, Iran-Anatolia, and Mediterranean Basin. Elazığ Province is situated at the heart of this region. Along the Euphrates, an ancient river system which acted as an important actor shaping faunal connections in West Asia through ages, the province has diverse habitat types and faunal components.

To date, a total of 116 species belonging to 30 genera from the families Agnaridae, Armadillidae, Armadillidiidae, Cylisticidae, Halophilosciidae, Ligiidae, Philosciidae, Platyarthridae, Porcellionidae, Trachelipodidae, Trichoniscidae and Tylidae have been recorded from Turkey (Schmalfuss, 2003a) <sup>[12]</sup>. Species composition, diversity and proportion of endemism varies considerably between the biogeographic sub regions of the country. Due to limited number of taxonomic studies (Verhoeff, 1941-1943 <sup>[21]</sup>; Strouhal, 1953 <sup>[18]</sup> and Vandel, 1980), the terrestrial isopod fauna Eastern Anatolia is poorly known. Up to the present, the fauna of terrestrial isopods of the East Anatolia region has been poorly investigated. This paper reports the characteristic features of *Schizidium davidi* (Dolfuss, 1887) and adds a species to the terrestrial isopods fauna of Turkey.

### Material and Methods

Specimens have been collected by by İnanç Özgen (Ozgen) and Eduard A. Khachilov (Khachikov) using shifter and handling methods of between 2013 to 2014 in Elazığ Province of Turkey (Fig 1.). Mostly river courses and deciduous *Quercus* woodlands were surveyed (Fig 2.). All material have been determined by the second author and deposited in third author private collection.

### Results and Discussion

Order Oniscidea

Infraorder Diplocheta

Family Ligiidae

*Ligidium tauricum* Verhoeff, 1943 <sup>[21]</sup>

**Material examined:** Elazığ, Yedigöze village, 3.VI.2013, 1 exc, leg. Ozgen & Khachikov

**Distribution:** Bursa Province (Schmalfuss, 2003) <sup>[12]</sup>

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**Remarks:** First report outside Marmara Region in Turkey.  
 Infraorder Crinocheta  
 Family Agnaridae

*Protracheoniscus marmaranus* Verhoeff, 1941

**Material examined:** Elazığ: Keban road, 8.VI.2013, 4 exc, leg. Ozgen&Khachikov

**Distribution:** Only known from its type locality near the north coast of Sea of Marmara in European Turkey) (Verhoeff, 1941). First record outside the Marmara Region of Turkey.  
 Family Armadillidiidae

*Schizidium davidi* (Dolfuss, 1887)

**Material examined:** Elazığ: Aşvan Village, 24. V.2013, 2 exc, leg. Ozgen&Khachikov; Uzuntarla Village, 3 exc, leg. Ozgen&Khachikov, (Figure 1).

**Totally:** 5 exc.

**Distribution in World:** Azerbaijan, Iraq along Euphrates river (Schmalfuss, 2003) <sup>[12]</sup>; Syria (See below) (Fig. 3.). New record for Turkey.

**Remarks**

4 localities including the type locality, "Syrie, Akbes", could not be localized by Schmalfuss (1988) <sup>[9]</sup>, and presumed to be somewhere in Iraq. Akbes or Akbez, refers to two villages in Turkey and Syria. The one in Syria is at the Turkish border near Hassa (Hatay), where the other locality is located, is more likely to be close to the actual locality due to habitat features. The other three localities around Tell Halaf, an archaeological site in northeastern Syria also near Turkey-Syria border opposite Ceylanpınar. Surname of Max von Oppenheim, the discoverer of the site, mentioned on the original labels as well as the collection dates coinciding with his temporary return to Germany (Langenegger *et al.* 1950) <sup>[3]</sup>, support the localization of the localities. Chabur (=Khabur River, a tributary to the Euphrates) and Djisdjib (locally 'a stream dry in summers', probably referring to the djisdjib passing by the site), read erroneously as Chabus and Djirdjib (Schmalfuss, 1988) <sup>[9]</sup>.

**Family Cylisticidae**

*Parcylisticus pugionifer pugionifer* Verhoeff, 1943 <sup>[21]</sup>

**Material examined:** Elazığ: Keban road, 26. V.2013, 3 exc, leg. Ozgen&Khachikov

**Distribution:** Only known from Elazığ Province (Ahrır Village, Elazığ) (Verhoeff, 1943; Strouhal, 1953) <sup>[22, 18]</sup>.

**Remarks:** The type locality, Ahrır (or Saraybaşı) Village, is completely lost as it is covered by Keban Dam Lake after 1965 (Sillier, 1976). *P. nivicomis* Verhoeff, 1949 <sup>[22]</sup> from Erciyes Mountain (Kayseri Province) was considered synonymous with *P. pugionifer* Verhoeff, 1943 <sup>[21]</sup> by Schmalfuss (2003b) <sup>[13]</sup>, while geographically close subspecies *P. p. syriacus* Schmalfuss, 1986 <sup>[7]</sup> was erected to specific status. However, the status of *P. p. kopdaghensis* Strouhal, 1953 <sup>[18]</sup>, another montane taxon from Turkey, remains uncertain (Schmalfuss 2003 a,b) <sup>[12, 13]</sup>. To resolve the relationships of these taxa, further material is needed.

**Family Porcellionidae**

*Porcellionides depressiorum* (Verhoeff, 1943) <sup>[21]</sup>

**Material examined:** Elazığ: Keban road, 22.V.2014, 3 exc, leg. Ozgen&Khachikov ; Sivrice, Hazarbaba Mountain, near the lake, 24.V.2013, 2 exc, Ozgen&Khachikov; Sivrice, 03.VI.2014, 5 exc, Ozgen & Khachikov; Baskil, Doğancık Village, 25.V.2013, 1 exc, leg. Ozgen&Khachikov.

**Totally:** 11 exc.

**Distribution:** Known only from its type locality near Lake Hazar, Elazığ (Verhoeff, 1943) <sup>[21]</sup>.

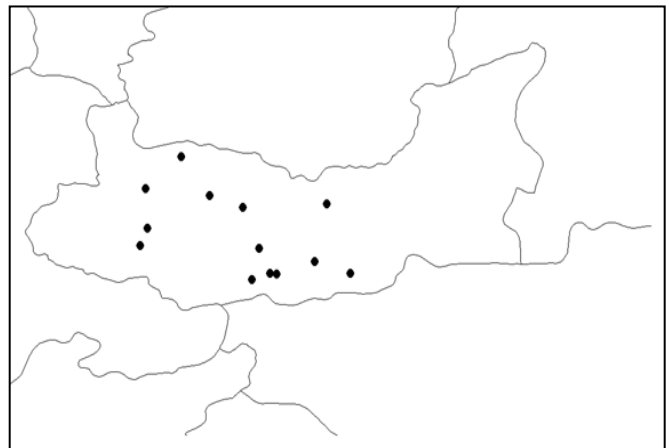
**Family Trachelipodidae**

*Trachelipus squamuliger* (Verhoeff, 1907)

**Material examined:** Elazığ: Baskil, Şahaplı Village, 25.V.2013, 2 exc, Ozgen&Khachikov; Baskil, Kayabeyli Village, 8 exc.; Sivrice, Kürkköy Village, 6 exc, leg. Ozgen&Khachikov.

**Totally:** 16 exc.

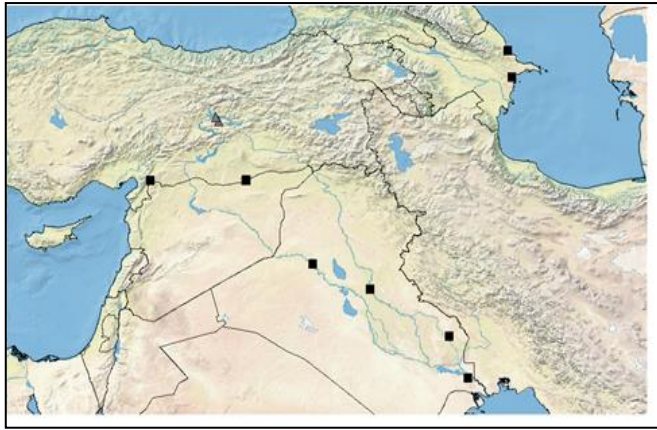
**Distribution:** SE Romania (Tomescu *et al.* 2015), N and E Greece along with several Aegean islands to the north (Schmalfuss, 1976, 1979), S Bulgaria and NW Turkey (Schmalfuss, 2003a; Schmidt, 2007) <sup>[12]</sup>. First record in Eastern Anatolia Region of Turkey.



**Fig 1:** Map of the study area and collection sites



**Fig 2:** Habitat of *Schizidium davidi* (Dolfuss, 1887) (Uzuntarla Village)



**Fig 3:** General distribution map of *Schizidium davidi*: previous records-squares, new records-triangles.

### Discussion

Terrestrial isopod fauna of Elazığ has not been studied since the study of Verhoeff (Verhoeff, 1943) [21], whose material based on the collection of C. Kosswig between years 1939 and 1944. Scantily data does not allow making zoogeographical remarks per species, except for considerations regarding ranges of the genera.

In addition to *Parcylisticus pugionifer pugionifer* Verhoeff, 1943 and *Porcellionides depressiorum* (Verhoeff, 1943) [21] recorded in the present study, *Ligidium riparum* Verhoeff, 1943 [21] and *Trachelipus kosswigii* (Verhoeff, 1943) [21] are the two other species described from the province of Elazığ (Verhoeff, 1943) [21]. No other species record is available since 1953 (Strouhal, 1953) [18]. Although this figure is relatively low considering the area and presence of variability of habitats from mesic to xeric, it is notable to mention here that the province has the highest number of species among Eastern Anatolian provinces.

Largely Western Palearctic genus *Porcellionides* is very common in Turkey, where it is represented with 8 species. *Porcellionides depressiorum* is a distinct species endemic to study area.

Among the genera recorded from the study area, primarily Asiatic genus *Protracheoniscus* is represented by 5 species in the terrestrial isopod fauna of Turkey. *Ligidium* is a crowded Holarctic genus represented by 8 species in Turkey. Taxonomy of the 16 species. Belonging Palearctic genus *Trachelipus* in Turkey is largely unresolved. It is difficult to explain zoogeographically the presence of the species of these genera, which have their main distributions in the northwestern Turkey, due to the distance and quite different climates. As the area in between is poorly surveyed, the clarification of the situation is left to future studies. However, such isolated occurrences are not uncommon. An example is the case of *Acaeroplastes kosswigi* Verhoeff, 1941 described from Istanbul (European Turkey) and later discovered from Azerbaijan (Schmalfuss, 1990) [10].

Likewise, large gaps among occurrences of several of the 6 *Schizidium* species distributed in Turkey can be observed. Main speciation center of this genus of Mediterranean origin, as its close relative *Armadillidium*, lies in the Aegean area (Schmalfuss, 2008) [14]. *S. reinoehli* Schmalfuss 1988 [9] was described from western Turkey and later discovered from Rostov Area (Khisametdinova, 2011; Kuznetsova and Gongalsky, 2012) [2]. *S. davidi* (Dolfuss, 1887), originally described from northwestern Syria was then discovered in

Azerbaijan (Schmalfuss, 1990) [10]. The new records from Turkey somewhat fills a gap between two ranges and suggest a very unique distribution pattern along entire Euphrates and Kura systems. *Porcellio evansi* Omer-Cooper, 1923 (Porcellionidae) and *Koweitoniscus tamei* (Omer-Cooper, 1923) are the two other oniscidean species sharing the distribution pattern along Tigris-Euphrates system (See Schmalfuss, 1990, 1992) [10].

*Parcylisticus* is represented by 5 all epigean species in Turkey, including *P. pugionifer* with 2 subspecies being the type species of the genus. Apparently, the genus is most diverse in the Transcaucasia, while the distribution area extends towards Eastern and Central Anatolian Plateau and through Euphrates into northern Syria. Although altitudinal range varies between near sea level (*P. georgianus* Schmalfuss, 2003) [12] to 3000 m (*P. angelikae* Schmalfuss, 2003) [12], general tendency towards drier montane habitats is observed. Thus, further discoveries of this genus in eastern and central Turkey are expected due to extensive areas having such habitat type.

Both *Schizidium* and *Parcylisticus*, share conglobation ability which is in its advanced (euspheric) state in the genus *Schizidium* and this is explained as an antipredatory adaptation. Though a convergent character among terrestrial isopod groups, this may at least partially an adaptation towards seasonal aridity progressing since Miocene in the Mediterranean Region as observed by Smigel and Gibbs (2008) [17] on *Armadillidium vulgare*. Further remarkable adaptive life style and character variations are displayed by the species of *Schizidium*, a paleorelict element.

The study area and nearby areas should be studied in detail to solve existing taxonomic problems. As in the other regions in Mediterranean basin, Province Elazığ is facing with high rate of population increase and resulting urbanization and habitat disturbance which also affects the environs of Hazar Lake, the type locality of the 4 species described from the area.

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