

Life in the Salt Edge: A New Spider Genus Record for Türkiye, *Devade* Simon, 1885 (Araneae, Argyronetidae)

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Received: 24.01.2026

Revised: 20.02.2026

Accepted: 21.02.2026

Published: 28.02.2026

Abstract: The spider genus *Devade* Simon, 1885 and its type species *Devade indistincta* (O. Pickard-Cambridge, 1872) are reported in Türkiye for the first time. Specimens were collected by hand under stones at Lake Meke (Konya Province, Central Anatolia). The locality is characterized by volcanic-based, sandy soft soil with sparse shrubbery and scattered grasses surrounding the saline lake. Detailed figures are provided to illustrate the habitus and the male palpal organs of the species. The known distribution records are mapped and habitat photographs are given.

Keywords: Araneae, Central Anatolia, *Devade indistincta*, fauna, new record.

Tuzcul Yaşam: Örümcek Cinsi *Devade* Simon, 1885'in Türkiye'den İlk Kaydı (Araneae, Argyronetidae)

Öz: Bu çalışmada, örümcek cinsi *Devade* Simon, 1885 ve tip türü *Devade indistincta* (O. Pickard-Cambridge, 1872), Türkiye'den ilk kez rapor edilmiştir. Bu kayıt, ülke için yeni bir örümcek cinsi ve türü kaydının ilk keşfini temsil etmektedir. Örnekler, Meke Gölü (Konya İli, İç Anadolu Bölgesi) yakınlarındaki taşların altından elle toplanmıştır. Türün habitatu, tuzlu gölü çevreleyen seyrek çalılıklar ve dağınık otlarla karakterize edilen volkanik tabanlı kumlu yumuşak topraktan oluşmaktadır. Çalışmada, türün erkek bireylerinin genel morfolojik görünüşü, palpal organlarına ilişkin ayrıntılı fotoğraflar ile birlikte sunulmuş ve morfolojik tanımlaması yapılmıştır. Ayrıca, türün bilinen dağılım kayıtları harita üzerinde gösterilmiş ve habitat fotoğrafları verilmiştir.

Anahtar kelimeler: Araneae, *Devade indistincta*, fauna, İç Anadolu, yeni kayıt.

1. Introduction

Devade Simon, 1885, is the second most numerous genus (14 species) after *Tricholathys* Chamberlin & Ivie, 1935 (20 species) within the family Argyronetidae Thorell, 1869, which consists of 74 species within 12 genera, of which only two have been documented in Türkiye. So far, members of the genus *Devade* have been documented to be mainly distributed in the Mediterranean, Near East and Central Asia (World Spider Catalog, 2026).

Members of this genus are characterized by a small size of less than 6 mm, tracheal spiracle near spinnerets, an undivided cribellum, legs with numerous spines, a male palpal cymbium with a basal fold, two large processes on the posterior arm of the conductor, and an epigyne with a distinct epigynal septum (Lehtinen, 1967; Wang et al., 2025).

Only *D. indistincta* (O. Pickard-Cambridge, 1872) is widely distributed throughout the Mediterranean region with disjunct records in the western Palaearctic from Azerbaijan, Iran, and Sudan. This species was originally described from Palestine (Jericho) by O. Pickard-Cambridge (1872). It has subsequently been recorded from

several regions including Algeria, Tunisia (Simon, 1885; Simon, 1911), Azerbaijan (Otto, 2022), Egypt (Simon, 1911; Denis, 1947; El-Hennawy, 2017), France (Simon, 1880; Simon, 1885), Greece (Bristowe, 1935), Iran (Zamani & Marusik, 2017), Libya (Caporiacco, 1928), Spain (Barrientos et al., 2016), and Sudan (Denis, 1957).

During the examination of newly collected material from the Central Anatolian Region, specimens of the genus *Devade* were identified. This study reports *D. indistincta* (O. Pickard-Cambridge, 1872) as a new genus and species record for the spider fauna of Türkiye.

2. Material and Method

The specimens were found under stones and collected using a hand aspirator in Konya Province, Central Anatolian Region of Türkiye. All samples were preserved in 70% ethanol for long-term storage and morphological examination.

All specimens were examined and measured using Leica M205 C and Leica S8 APO stereomicroscopes. Microscopic photographs of the habitus and male palps were captured with a "Leica DFC 295" camera and a "Zeiss Axiocam 208 color" camera attached to a Leica S8 APO

stereomicroscope. Images were captured at different focal planes and combined into stacks using Zerene Stacker. Leg measurements are given as: total length (femur + patella + tibia + metatarsus + tarsus) and all measurements are given in millimeters (mm).

Taxonomy and nomenclature follow the World Spider Catalog (2026) and the terminology for the male palpal morphology follows Wang et al. (2025). The specimens are deposited in the Zoological Museum of Bursa Uludağ University, Türkiye (ZMUU, R.S. Kaya).

Abbreviations:

BF: Basidorsal fold of cymbium

E: Embolus

MPA: Mesal process of conductor posterior arm

RPA: Retrolateral process of conductor posterior arm

RTA: Retrolateral tibial apophysis

3. Results

Class Arachnida Cuvier, 1812

Order Araneae Clerck, 1757

Family Argynnetidae Thorell, 1869

Genus *Devade* Simon, 1885

Type species *Diotima hirsutissima* Simon, 1880

(considered a junior synonym of *Amaurobius indistinctus* O. Pickard-Cambridge, 1872).

Small to medium-sized (3-6 mm) and light-colored spiders. Carapace yellowish brown to brown. Eight eyes. Fovea longitudinal. Legs with tibial and metatarsal spines. Calamistrum absent in male and weak in female. Abdomen oval, dorsum yellow brown to dark brown, with a few light chevrons dorsally. Venter of abdomen yellowish brown, with small and undivided cribellum (Lehtinen, 1967; Wang et al., 2025).

Species *Devade indistincta* (O. Pickard-Cambridge, 1872)

For a complete list of synonyms, see the World Spider Catalog (2026).

Amaurobius indistinctus O. Pickard-Cambridge (1872): page 264 (♀).

Diotima hirsutissima Simon (1880): page 55 (♂♀).

Devade hirsutissima Simon (1885): page 323.

Altella libyca Denis (1947): page 29, plate 1, figure 1 (♀).

Strinatella spinosa Denis (1957): page 448, figures 2-3 (♀).

Devade indistincta Lehtinen (1967): page 228, figure 276 (♀).

Devade indistincta Esyunin & Efimik (2000): page 680, figures 1.7-8, 2.10, 3.5 (♂♀).

Devade indistincta Barrientos et al. (2016): page 95, figures 11-13 (♂).

Devade indistincta Zamani & Marusik (2017): page 322, figure 4g (♂).



Figure 1. General habitus of male *Devade indistincta* (O. Pickard-Cambridge, 1872). A. Dorsal view. B. Ventral view (Scale line: 0.5 mm).



Figure 2. Cephalothorax of male *Devade indistincta* (O. Pickard-Cambridge, 1872). A. Dorsal view. B. Ventral view (Scale lines: 0.5 mm).

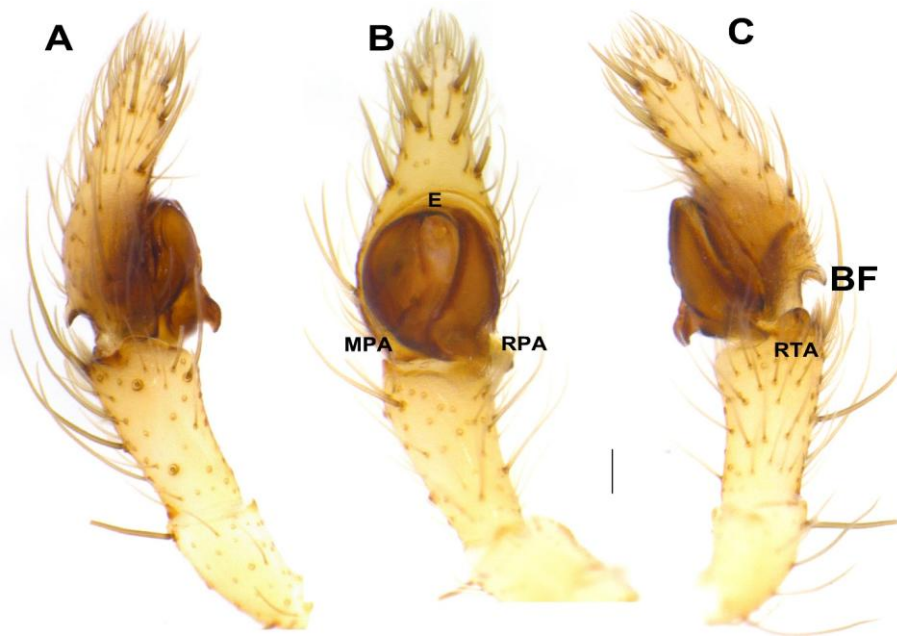


Figure 3. Male pedipalp of *Devade indistincta* (O. Pickard-Cambridge, 1872). A. Prolateral view. B. Ventral view. C. Retrolateral view (Scale line: 0.1 mm). BF: Basidorsal fold of cymbium, E: Embolus, MPA: Mesal process of conductor posterior arm, RPA: Retrolateral process of conductor posterior arm, RTA: Retrolateral tibial apophysis.

Material examined.

Türkiye: • 1♂: Konya Province, Karapınar District, Meke Salt Lake, 37°41'14"N, 33°38'03"E, 02.04.2017, leg. E.A. Yağmur. • 2♂♂, 2 juveniles: same locality, 08.04.2019, leg. E.A. Yağmur.

Description.

Male. General appearance as shown in Fig. 1A-B. Measurements (n=3): Total length 3.32-3.99.

Carapace 1.51-1.80 long, 1.21-1.40 wide; Carapace light yellowish brown with a darker cephalic region. Ocular area dark (Fig. 2A). Chelicerae 0.73-0.91 long. Chelicerae brown, with 3 promarginal and 2 retromarginal teeth. Sternum 0.96-1.05 long, 0.85-0.93 wide. Sternum light yellow with dark margins, posteriorly pointed. Maxillae and labium pale brown (Fig. 2B). Legs yellowish, with many spines and long thin hairs. Measurements of legs: I: 4.48-5.64 (1.28-1.46, 0.55-0.66, 0.96-1.41, 1.01-1.28, 0.68-0.83), II: 4.00-5.25 (1.09-1.45, 0.55-0.62, 0.90-1.18, 0.85-1.21, 0.61-0.79), III: 4.53-4.63 (1.17-1.29, 0.46-0.51, 0.94-0.97, 1.23-1.37, 0.70-0.52), IV: 5.46-6.2 (1.40-1.52, 0.63-0.56, 1.20-1.44, 1.48-1.76, 0.75-0.92). Abdomen 1.81-2.19 long, 1.05-1.20 wide. Abdomen light grayish and with gray patches and lines. Abdomen with numerous thin and dark hairs dorsally (Fig. 1A). Spinnerets pale yellow.

Palp as in Figs. 3A-C, 4; palp yellowish 1.77-2.24 long (0.70-0.82, 0.26-0.34, 0.28-0.39, 0.53-0.69)

Femur longer than patella+tibia. Patella short and approximately as long as tibia. Tibia short, about 1.8 times shorter than cymbium length. Cymbium longer than wide (two times as long as wide), narrow towards tip. Basidorsal fold rounded in dorsal view and finger-shaped in retrolateral view. Posterior arm of conductor with two large processes: mesal process L-shaped with pointed tip, retrolateral process wide and laminar. Embolus originating at 11:30 o'clock position.

Remark.

Species identification within the genus *Devade*, particularly between *D. indistincta* and *D. tenella* (Tystshenko, 1965), has long been problematic due to the high degree of morphological similarity in the male copulatory organs. Furthermore, as noted by Wang et al. (2025), the identification of *D. tenella* is based on misidentifications in most references. Although several characters have been proposed to distinguish males, primarily the relative length of the palpal tibia and cymbium, the shape and size of the mesal, retrolateral processes of the posterior arm of the conductor, and the relative length of the cymbial tip, these features show considerable overlap and intraspecific variation limiting their diagnostic value. Consequently, reliable species identification within this genus is considered to rely mainly on female genital morphology, with the shape of the epigynal septum representing the principal distinguishing character between species. In male specimens examined in this study, the palpal tibia is relatively longer compared to the cymbium, the retrolateral tip of the posterior arm of the conductor is moderately broadened and in some views weakly bilobed, and the cymbial tip is elongated, reaching approximately the length of the bulb. In contrast, published descriptions of *D. tenella* indicate a comparatively shorter palpal tibia relative to the cymbium, a more pointed retrolateral process of the conductor, and a shorter, blunt cymbial tip. The combination of characters observed in our specimens therefore corresponds more closely with the morphology attributed to *D. indistincta*. However, the lack of detailed studies based on the type material of *D. indistincta*, the absence of such an examination in the present study, the current lack of well-established diagnostic characters separating *D. indistincta* and *D. tenella* in the literature, and the absence of a comprehensive revision of the genus *Devade* necessitate a cautious approach. For the time being, the examined specimens are therefore treated as *D. indistincta*. Nevertheless, the discovery of conspecific

females and the availability of freshly collected material from the same locality will be essential to determine whether these specimens represent *D. indistincta* or an

undescribed species, a question that can only be resolved through future integrative studies.



Figure 4. Male pedipalps of *Devade indistincta* (O. Pickard-Cambridge, 1872) (three specimens) ventral, retrolateral, and dorsal views (Scale lines: 0.1 mm).

Habitat. The maars in the Konya Province represent some of the products of volcanism in the Central Anatolian region from the Neogene to the present day. Meke Crater was formed during the final stage of volcanism active in the Plio-Quaternary period and is composed mainly of basaltic-andesitic and andesitic rocks (Güllü & Kadioğlu, 2019). The crater includes a salt lake, which includes various islets within itself. Our specimens were collected from under the stones around the lake, which is located inside the crater. The habitat is characterized by sandy soft

soil, including some small bushes and scattered grasses (Fig. 5).

Distribution. Algeria and Tunisia (Simon, 1885; Simon, 1911), Azerbaijan (Otto, 2022), Egypt (Simon, 1911; Denis, 1947; El-Hennawy, 2017), France (Simon, 1880; Simon, 1885), Greece (Bristowe, 1935), Iran (Zamani & Marusik, 2017), Libya (Caporiacco, 1928), Palestina (O. Pickard-Cambridge, 1872), Spain (Barrientos et al., 2016), Sudan (Denis, 1957), and Türkiye (present study) (Figs. 6-7).



Figure 5. General views of the locality where the specimens were collected around Lake Meke.



Figure 6. Map showing the collecting locality of *Devade indistincta* (O. Pickard-Cambridge, 1872) in Türkiye.

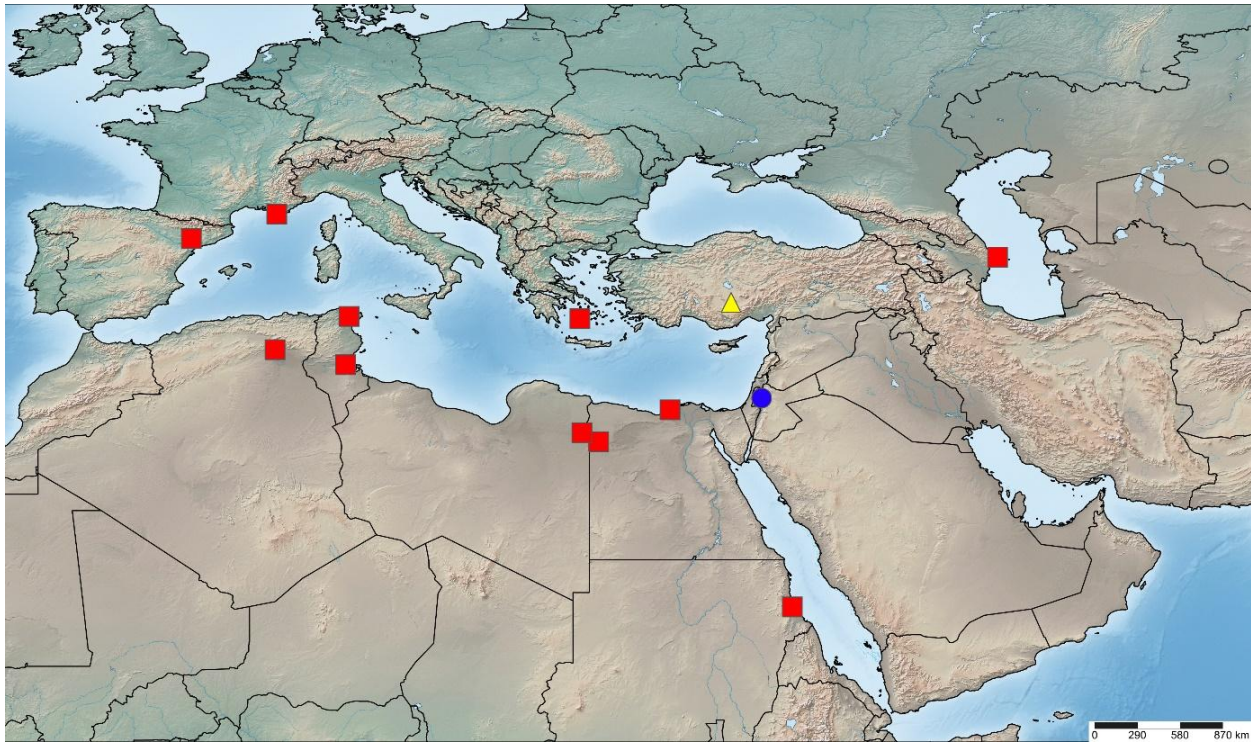


Figure 7. The distribution map of *Devade indistincta* (O. Pickard-Cambridge, 1872) in west Palearctic [Blue circle: indicates the type locality; Red squares: distributional records in the literature, Yellow triangle: new record, Türkiye, Konya, Lake Meke (the present study)].

4. Discussion

This study presents the first record of *Devade indistincta* from Türkiye, marking the first record of the genus in the country. With this addition, the known biodiversity of Argyronetidae in Türkiye has increased to three genera and three species.

Devade indistincta has a broad but fragmented distribution across the Mediterranean basin and adjacent regions (Fig. 7). Since its original description as *Amaurobius indistinctus* from Palestine by O. Pickard-Cambridge (1872), the species has undergone several taxonomic revisions, being placed in various genera such as *Diotima*, *Altella*, and *Strinatina* before its current placement in *Devade* by Lehtinen (1967).

Ecologically, members of *Devade* are notably specialized and predominantly found in aquatic habitats and salty areas throughout the Mediterranean and Eurasia (Crews et al., 2020). Species of *Devade* occur in salt marshes along lake shores and riverbanks and may have a strong ability to resist high salinity (Wang et al., 2025). The data provided by the literature indicate that *D. indistincta* has a great affinity for salty soils (Simon, 1885; Simon, 1911; Denis, 1947), coasts (Simon, 1880), coral island (Denis, 1957), and sandy soft soils (Simon, 1911; Denis, 1947). Our specimens were collected under the stones around a salty lake and the area is represented by sandy soft soils. The collecting site in the Konya Province (the Meke Crater Lake) perfectly mirrors these ecological preferences. Given its current distribution, it is highly probable that *D. indistincta* occurs in other Mediterranean regions where suitable saline habitats exist.

Given its widespread records from Spain to Azerbaijan, the presence of *D. indistincta* in Türkiye was expected but had remained undocumented until now. This

gap was likely due to the cryptic lifestyle and its preference for specialized, often under-sampled saline habitats. Further araneological surveys in other saline-alkaline lakes of the "Lake District" in Türkiye and along the Mediterranean coastline will likely reveal a more continuous distribution for this species.

Furthermore, the discovery of *D. indistincta* at Lake Meke highlights the conservation of such unique ecosystems. Lake Meke, a Ramsar site and a first-degree natural protected area, has faced severe desiccation in recent years due to climate change and intensive groundwater use for agriculture in the basin. The loss of water and the subsequent alteration of soil salinity levels pose a direct threat to specialized halophilic species. Since *D. indistincta* is ecologically tied to these rare saline-sandy microhabitats, the ongoing environmental degradation of the Meke Crater may threaten the persistence of such niche-specialized fauna. Therefore, preserving the hydrological and geological integrity of the Central Anatolian maars is not only crucial for landscape conservation but also vital for the survival of Türkiye's rare and halophilic spider diversity.

Acknowledgment: We would like to thank to Prof. Dr. Özer YILMAZ (Bursa Uludağ University, Department of Biology) for allowing to use the Leica M205 C Stereomicroscope (Research Foundation of Bursa Uludağ University Project No: F-2005/4) and take the photographs.

Ethics committee approval: Ethics committee approval is not required for this study.

Conflict of interest: The authors declare that there is no conflict of interest.

Author Contributions: Conception – R.S.K., E.A.Y., G.G.; Design – R.S.K., E.A.Y., G.G.; Supervision – R.S.K., E.A.Y., G.G.; Materials

– E.A.Y.; Analysis Interpretation – R.S.K., E.A.Y., G.G.; Literature Review – R.S.K., G.G.; Writing – R.S.K., G.G.; Critical Review – R.S.K., E.A.Y., G.G.

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