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A new species of *Euscorpius* Thorell, 1876 (Scorpiones, Euscorpiidae) from Turkey

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Abstract

A new species of the genus *Euscorpius* Thorell, 1876 is described based on specimens collected from Dilek Peninsula (Davutlar, Aydın) in Turkey. It is characterized by an oligotrichous trichobothrial pattern (*Pv*= 7, *et*= 5/6, *eb*= 4) and small size. *Euscorpius* (*Euscorpius*) *avcii* **sp. n.** is the first named species of the subgenus *Euscorpius* from Turkey.

Keywords

Scorpion, *Euscorpius*, new species, Turkey

Introduction

The genus *Euscorpius* Thorell, 1876 is one of the most studied taxa of scorpions. According to the present taxonomy, it includes 18 species grouped in four subgenera (*Alpiscorpius* Gantenbein et al. 1999; *Euscorpius* Thorell, 1876; *Polytrichobothrius* Birula, 1917; *Tetratrichobothrius* Birula, 1917) (Fet et al. 2004; Vignoli and Salomone 2008; Tropea 2012). However, its taxonomy is still not totally clear, especially in the Balkans and Turkey but also in Western Europe. The *Euscorpius* populations of Turkey have been poorly studied up to now, and only two valid species are recognized; *E.* (*Polytrichobothrius*) *italicus* (Herbst, 1800) and *E.* (*Alpiscorpius*) *mingrelicus* (Kessler, 1874). The latter is a species complex with six subspecies in Turkey (*E. m. mingrelicus* (Kessler, 1874), *E. m. ciliciensis* Birula, 1898, *E. m. phrygius* Bonacina, 1980, *E. m. ollivieri* Lacroix, 1995, *E. m. legrandi* Lacroix, 1995, and *E. m. uludagensis* Lacroix, 1995) that need clarification. Presence of the *"carpathicus* complex" have been reported by several authors; Hadži (1930) reported it from İstanbul; Schenkel (1947) from Havza (Samsun); Vachon (1951) from Acıpayam and Honaz Mountain (Denizli), Eğridir (Isparta), Korikos (Mersin) and İstanbul; Tolunay (1959) from Sinop; Kinzelbach (1975, 1982) from Amasya, the Middle Taurus, Borçka (Artvin), Çanakkale, Trakya and Efes (Izmir); Karatas (2006) from Marmara area, Sinop, Ada vicinity, Alanya, Avsallar, Fethiye and Kelebekler Valley; Koç and Yağmur (2007) from Dilek peninsula.

Kinzelbach (1975) divided *E. carpathicus* into two species, *E. carpathicus* and *E. mesotrichus* Hadži, 1929. According to Kinzelbach (1975), *E. tergestinus* is a synonym of *E. mesotrichus*, but the latter name is not available because it is a junior homonym of *E. italicus mesotrichus* Hadži, 1929 (Di Caporiacco 1950; Fet 1997b; Fet and Braunwalder 2000). *E. mesotrichus* was synonymized with *E. tergestinus* by Caporiacco (1950) and according to Fet and Braunwalder (2000) the correct name for this species should be *E. tergestinus*, but further studies (Gantenbein et al. 2001; Fet et al. 2003) reported that "*E. mesotrichus*" of Kinzelbach also refers to other species such as *E. balearicus* and *E. sicanus,* besides *E. tergestinus* and other forms waiting for clarification. "*E. mesotrichus*" was recorded in Turkey from Şile (İstanbul) and Prinkipos Island (Büyükada Island) in the Marmara Sea by Kinzelbach (1975).

Koç and Yağmur (2007) reported a population from Dilek Peninsula in Western Turkey as *Euscorpius sp.* ("*carpathicus* complex"). A Dilek specimen was also listed by Vignoli and Salomone (2008) as *E.* cf. *tergestinus* (AMNH, Söke, Davutlar, 44 m a.s.l., 28.IV.2005, H. Koç). This population is described in this study as a new species, *Euscorpius avcii* sp. n. According to our preliminary studies on Turkish *Euscorpius* populations, more species and forms ranging from polytrichous to oligotrichous are present and of these, the latter exhibits diagnostic characters that appear intermediate between the subgenus *Euscorpius* and *Alpiscorpius*. The new species, *Euscorpius avcii* sp. n. is oligotrichous and differs from other forms of the genus *Euscorpius* enough to justify its description as the first species of the subgenus *Euscorpius* to be registered in Turkey.

Materials and methods

A number of 79 specimens collected at Dilek Peninsula, in Turkey, were examined. Furthermore, 56 specimens from MZUF (*Euscorpius tergestinus* (C.L. Koch, 1837): 132/5856, 84/5847, 5848, 5861, 5862, 5863, 131/5838, 5839, 5840, 5841, 5842, 5843, 132/5854, 5856, 5857, 5860, 135/5699, 161/5850, 5851, 162/5864, 5865, 5866, 5867, 163/5987, 5988, 5889, 5990, 5991, 5992, 5993, 5994, 5995, 5996, 5997, 5998, 180/5852, 1417/5999, 6000, 6001, 6002, 6003, 6004, 6005, 6006, 6007, 6008, 6009, 6010, 6011, 6012, 165/6226, 73/6032, 1149/6238; *Euscorpius oglasae* Caporiacco, 1950 lectotype 122/5974, paralectotypes 123/5975) and 13 specimens of the private collection of Gioele Tropea (10 *Euscorpius tergestinus* (C.L. Koch, 1837) from Italy (Abruzzo, Latium and Umbria) and 3 *Euscorpius carpathicus* sensu stricto (Linnaeus, 1767) from Romania) were included in this study as comparison material.

Abbreviations: *V*: trichobothria on ventral pedipalp chela manus; *Pv*: trichobothria on patella ventral surface; *Pe*: trichobothria on the pedipalp patella external surface; *et*: external terminal; *est*: external sub-terminal; *em*: external medium; *esb*: external suprabasal; *eba*: external basal *a*; *eb*: external basal; DPS: dorsal patellar spur; DD: distal denticle; MD: median dentition; OD: outer dentition; ID: inner dentition; IAD: inner accessory denticles; AMNH: American Museum of Natural History, New York, USA; MZUF: Museo Zoologico 'La Specola' dell'Università di Firenze, Florence, Italy; GTC: private collection of Gioele Tropea; MTAS: Museum of the Turkish Arachnological Society; ZMSU: Zoology Museum of Sinop University; KUAM: Arachnological Museum of Kırıkkale University; ARC: private collection of Andrea Rossi.

The trichobothrial notations follow Vachon (1974). The morphological measurements are given in millimeters (mm) following Stahnke (1970). The morphological nomenclature follows Stahnke (1970), Hjelle (1990) and Sissom (1990); the chela carinae and denticle configuration follows Soleglad and Sissom (2001) and sternum terminology follows Soleglad and Fet (2003); description of hemispermatophore and terminology follows Soleglad and Sissom (2001) and Fet and Soleglad (2002).

Taxonomy

Family Euscorpiidae Laurie, 1896
Genus *Euscorpius* Thorell, 1876
Subgenus *Euscorpius* Thorell, 1876

***Euscorpius avcii* Tropea, Yağmur, Koç, Yeşilyurt & Rossi, sp. n.**
urn:lsid:zoobank.org:act:B6799900-DF03-488A-B675-F0195AEB9825
http://species-id.net/wiki/Euscorpius_avcii

Type material. Holotype: 1 ♂, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası, Aydın, Turkey, 07.10.2005, leg. H. Koç (MTAS).

Paratypes: 1. 2 ♀♀, 3 ♂♂, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası District, Aydın Province, Turkey, 06.11.2004, leg. H. Koç (ZMSU); 2 ♀♀, 1 sub♂, 3 sub♀, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası District, Aydın Province, Turkey, 07.10.2005, leg. H. Koç (MZUF); same data but 1 ♂, 2 ♀ (GTC); 4 ♂♂, 3 ♀♀, Dilek Peninsula National Park, Canyon, Kuşadası District, Aydın Province, Turkey, 04.05.2011. 37°41'37"N, 27°09'37"E, 82 m, leg. E.A. Yağmur, A. Avcı and F. Yeşilyurt (MTAS); 5 ♂♂, 10 ♀♀, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası District, Aydın Province, Turkey, 07.10.2005, leg. H. Koç (ZMSU); 3 ♀♀, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası District, Aydın Province, Turkey, 18.06.2005, leg. H. Koç (ZMSU).

2. 3 ♂♂, 6 ♀♀, 5 km south of Güzelçamlı Village, Davutlar Town, Kuşadası District, Aydın Province, Turkey, 07.06.2011, 37°41'22"N, 27°13'31"E, 311 m, leg. F. Yeşilyurt and E.A. Yağmur (KUAM). Same data but 1 ♂, 1 ♀ (ARC). 3 ♂♂, 8 ♀♀. 5 km south of Güzelçamlı Village, Davutlar Town, Kuşadası District, Aydın Province, Turkey, 13.07.2010, 37°41'25"N, 27°13'53"E, 428 m, leg. F. Yeşilyurt and T. Danışman (KUAM).

3. 1 ♂, 8 ♀♀, Dilek Peninsula, 2 km south of Davutlar Town, pine forest, Kuşadası District, Aydın Province, Turkey, 02.07.2011, leg. E.A. Yağmur and A. Avcı (MTAS).

4. 6 ♂♂, 2 ♀♀, Dilek Peninsula National Park, picnic area, laurel forest, Kuşadası District, Aydın Province, Turkey, 13.08.2009, leg. E.A. Yağmur, N. Tezcan and V. Ülgezer (MTAS).

Etymology. The specific epithet refers to Dr. Aziz Avcı who is a Turkish herpetologist and the new species is named after him for his kind contributions to collecting scorpion species and his friendship.

Diagnosis. A small *Euscorpius* species, total length 24–28 mm. Color of adults is light brown to brown-reddish with the carapace and pedipalps darker brown-reddish, legs and telson lighter, yellowish colored. *E. avcii* sp. n. is oligotrichous; the number of trichobothria on the pedipalp manus ventral surface is 4 (3 *V* + *Et* 1); the number of trichobothria on the pedipalp patella ventral surface is 7 (of 78.5% of examined specimens and of 88% of pedipalps). The number of trichobothria on pedipalp patella external surface is: *eb* = 4, *eba* = 4, *esb* = 2, *em* = 4, *est* = 4, *et* = 5/6 (generally 5). The pectinal teeth count is: 7-9 (generally 8) in males, 6-7 (generally 7) in females. The telson vesicle in males is more swollen than in females, but only slightly more swollen if compared to other species of the subgenus *Euscorpius*. The pedipalps are stocky with a notch on fixed finger and scalloping of the movable finger well developed in adult males, obsolete in females. The dorsal patellar spur is weakly developed. Carinae on the metasomal segments are strongly reduced, almost smooth. Average value of the length from center median eyes to anterior margin of the carapace is equivalent to 39.20±2.0% of the carapace length. Average value of the length from center median eyes to posterior margin of the carapace is equivalent to 60.80±2.0% of the carapace length.

Description of the holotype male. Coloration: Light brownish with carapace and pedipalps darker, brownish-reddish, legs, telson and chelicerae are lighter,

yellowish-orange. Carapace slightly marbled. The coxal region is distinctly brownish-orange colored. The sternites, pectines and genital operculum are very light brownish-white (Fig. 3, 4 and 5).

Carapace: Length 3.70 mm; posterior width 3.75. Very slightly and finely granulated in laterally. All the furrows are shallow, only the posterior lateral furrows are slightly more marked. Distance from the center of the median eyes to the anterior margin of the carapace is equivalent to 39.62% of the prosoma; the length from the center of the median eyes to the posterior margin of the carapace is equivalent to 60.38% of the prosoma (Fig. 1A).

Mesosoma: Tergites very slightly and finely granulated, almost smooth; sternites smooth. The area of overlap between the sternites is lighter in color. Pectinal teeth count is 8-9. The spiracles are very small, oval shaped and it is inclined to about 45° downwards towards outside.

Metasoma: Medium to small size with respect to body length. Dorsal carinae from segment I–IV are almost smooth, exhibit a few distanced fine granules, obsolete or almost obsolete on the segment V; ventromedian carinae from segment I–IV absent; ventromedian carinae on segment V are formed by very fine granules. Ventrolateral carinae from segment I–IV are obsolete; on segment V they are formed by a few spaced granules (Fig. 2E,F).

Telson: Vesicle weakly swollen (Fig. 2A); smooth, with ventral setae of different sizes; telson height 1.37, telson length 3.65, vesicle length 2.65, vesicle width 1.40.

Pectines: Pectinal teeth count 8-9; middle lamellae count 5-4.

Genital operculum: Partially divided with genital papillae protruding; a few microsetae present.

Sternum: Pentagonal shape, type 2. Length similar to width, deep posterior emargination.

Pedipalp: Coxa and trochanter with strong granulation. Femur: dorsal internal carinae tuberculate; dorsal external carinae formed by low spaced tubercles, their size increases from distal to proximal. Intercarinal spaces bears scattered small granules, larger in the posterior proximal area. Ventral external carina is granulated in the proximal half. External median carinae serrulate, anterior median crenulate and tuberculate distally. Patella length 3.25; patella width 1.20; dorsal internal carinae crenulate. Dorsal external carinae from rough to smooth and are crenulate proximally. Ventral external carinae from smooth to rough. Ventral internal carinae serrulate. Intercarinal tegument smooth or rough. Dorsal patellar spur weakly developed (Fig. 1E).

Chelal carina D_1 is distinctly strong, dark and from smooth to rough; D_4 is formed from scattered granules; V_1 is distinctly strong, crenulate and dark; V_3 is formed from granules on 2/3 of length. External carina with granules on distal half. Intercarinal tegument rough or smooth except between carinae *D4* and *V3*. Movable finger dentition: MD like a straight line formed from very small denticles closely spaced and an DD on the distal tip; OD formed from 7 denticles on movable finger and 6 denticles on fixed finger, immediately outside of MD, their size increases progressively but the terminal denticle is not very pronounced; ID formed from 7

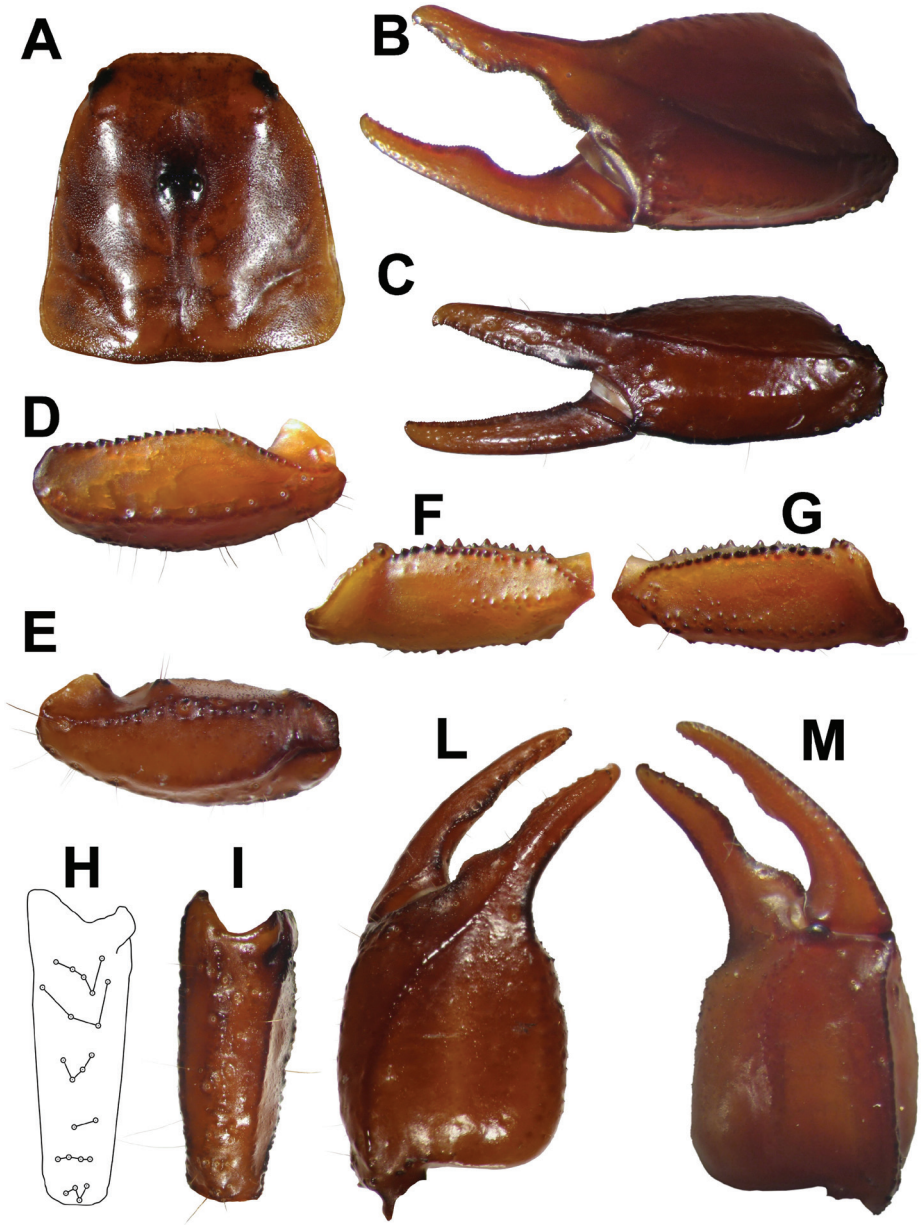

Figure 1. A carapace **B** external view of chela of the adult male **C** external view oh chela of the adult female **D** ventral view of pedipalp patella **E** dorsal view of pedipalp patella **F** ventral view of pedipalp femur **G** dorsal view of pedipalp femur **H** schematic view of trichobothrial pattern on external surface of pedipalp patella **I** view of external surface of pedipalp patella **L** dorsal view of chela **M** ventral view of chela.

denticles on movable finger and 6 denticles on fixed finger, spaced from MD, their size increases progressively but the terminal denticle is not very pronounced; IAD on both movable and fixed finger formed from 4 small denticles.

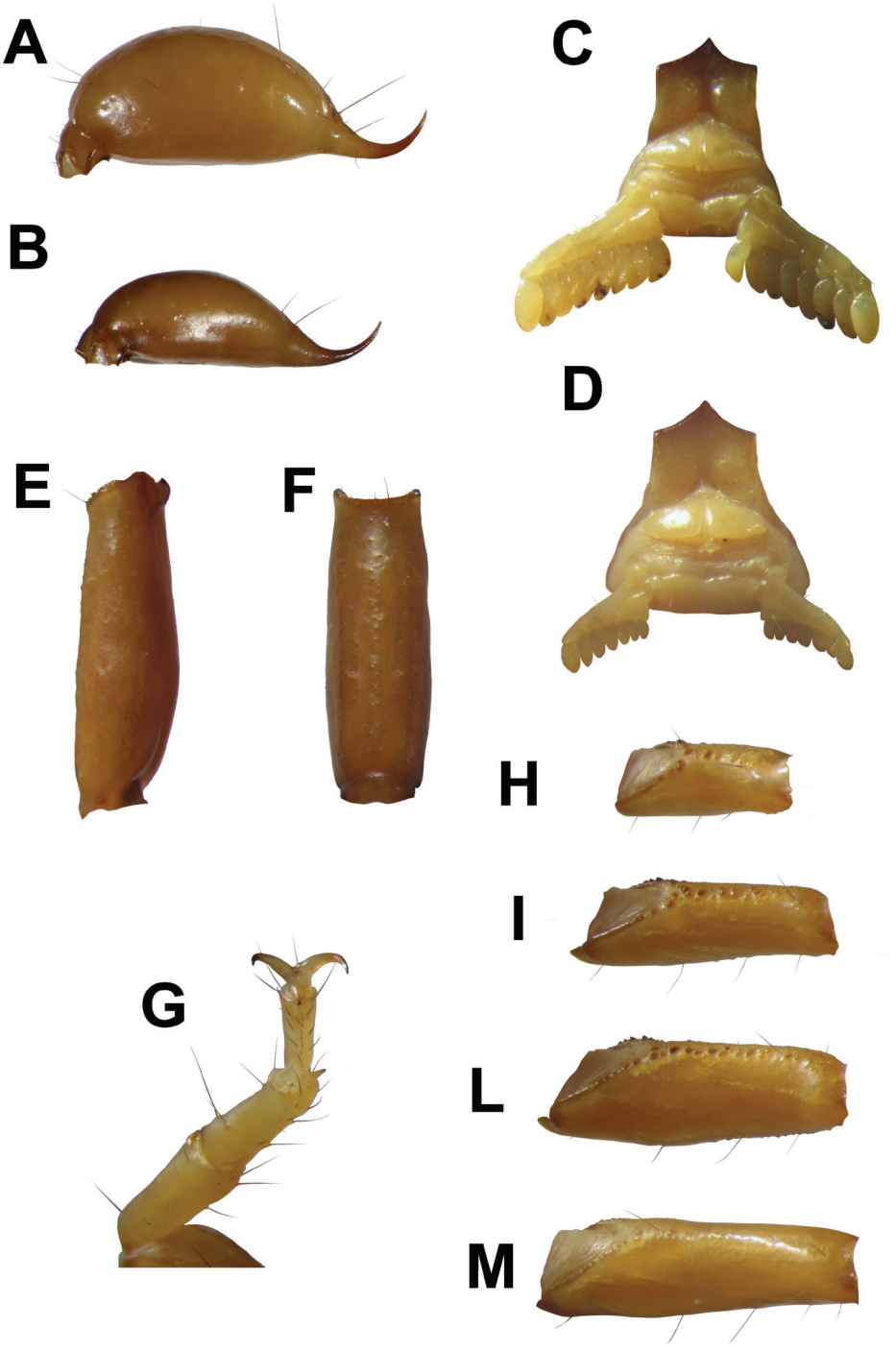

Figure 2. A telson of adult male **B** telson of adult female **C** sternopectinal area of adult male **D** sternopectinal area of adult female **E** latero-dorsal view of the metasomal segment V **F** ventral view of the metasomal segment V **G** tarsus and basitarsus **H** leg femur I **I** leg femur II **L** leg femur III **M** leg femur IV.

Figure 3. Dorsal and ventral views of *Euscorpius avcii* sp. n. male.

Trichobothria: Chela trichobothria series *V* standard: *V* = 4-4 (3 *V*+ *Et*1); patella ventral (*P*v): 8-7; Patella external (*P*e): *et* = 5-5, *est* = 4-4, *em* = 4-4, *esb* = 2-2, *eba* = 4-4, *eb* = 4-4.

Legs: legs with two pedal spurs. Tarsal ventral row with 10-12 stout spinules; 3 tarsal setae flanked pairs adjacent to the ventral spinules row. Basitarsus with 6 prolateral stout spinules on leg pair I; 7 prolateral stout spinules on leg pair II; 1 prolateral stout spinules on leg pair III; absent on leg pair IV. Granulation on the leg femora II and III is more marked both dorsally and ventrally, and only ventrally on leg I. Granulation is formed from dark granules; while the granulation on the dorsal surface of the femur of leg I and on the femur of leg IV both dorsally and ventrally is weakly marked and of lighter colored granules.

Chelicerae: movable finger: The dorsal distal tooth is smaller than the ventral distal tooth; Ventral edge is smooth with brush-like setae on the inner part; dorsal edge has five teeth: one distal, two small subdistal, one big median and a small basal; fixed finger has four teeth: one distal, one subdistal, one median and one basal. The median and the basal are in a fork arrangement. The internal edge has brush-like setae.

Variation: The variation observed in 79 studied specimens (29 males, 50 females) is the follows: pectinal teeth in males: 7-7 (1/29), 8-8 (23/29), 8-9 (4/29), 9-9 (1/29);

Figure 4. Dorsal and ventral views of *Euscorpius avcii* sp. n. female.

Figure 5. *Euscorpius avcii* sp. n. in its natural habitat.

females: 6-6 (5/50), 6-7 (11/50), 7-7 (34/50); pedipalp patella trichobothria *Pv*: 8-8 (2/79), 8-7 (9/79), 7-7 (62/79), 6-7 (6/79); pedipalp patella trichobothria *Pe*: *et* = 5-5 (41/79), 5-6 (19/79), 6-6 (19/79); *est* = 4-4 (79/79), *em* = 4-4 (79/79), *esb*= 2-2 (79/79), *eba* = 4-4 (79/79), eb = 4-4 (79/79). The variation in the trichobothrial pattern is within the standard values of variability and shows the stability of diagnostic characters.

Hemispermatophore. Well developed lamina with well visible basal constriction, tapered distally; truncal flexure present and well developed; capsular lobe complex well developed, with acuminate process; ental channel spinose distally, exhibiting six delicate variable sized spines (Fig. 6).

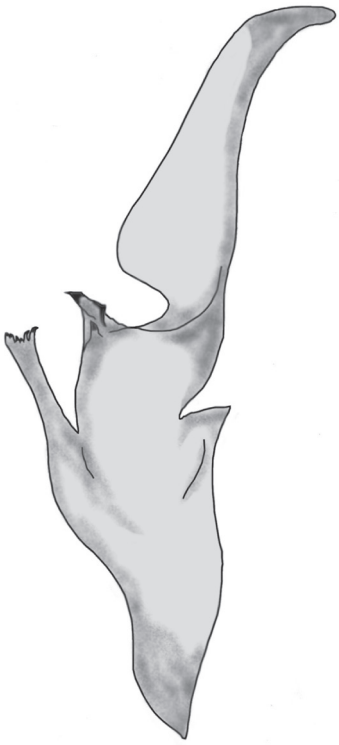

Figure 6. Left hemispermatophore of *Euscorpius avcii* sp. n.

Discussion

Euscorpius avcii sp. n. is an oligotrichous form with *Pv* = 7 and *Pe-et* = 5/6. Most of the species belonging to the subgenus *Euscorpius* have generally higher trichobothrial numbers, with some exceptions e.g. *Euscorpius oglasae* Di Caporiacco, 1950 (*Pv* = 7, *Pe-et* = 5) (Vignoli et al. 2007) and an unnamed form from the island of Samos in Greece (*Pv* = 5, *Pe-et* = 5) (Vignoli and Salomone 2008). Kinzelbach (1975) mentions *E. carpathicus* (Linnaeus, 1767) and *Euscorpius mesotrichus* from some localities in Turkey, according to the author the specimens with *Pv* 7/8 are *E. carpathicus*,

Table 1. Measurements (in mm) of male holotype and female and male paratype of *Euscorpius avcii* sp. n.

		Holotype	Paratype female	Paratype male
Total	Length	26.18	23.65	27.70
Carapace	Length	3.70	3.60	3.90
	Posterior width	3.75	3.70	3.80
Metasoma	Length	9.78	8.20	10.10
Segment I	Length	1.25	1.10	1.30
	Width	1.40	1.30	1.40
Segment II	Length	1.50	1.35	1.60
	Width	1.20	1.10	1.20
Segment III	Length	1.75	1.45	1.80
	Width	1.15	1.05	1.10
Segment IV	Length	2.05	1.70	2.20
	Width	1.07	1.00	1.05
Segment V	Length	3.23	2.60	3.20
	Width	1.10	1.00	1.10
Telson	Length	3.65	2.85	3.70
Vesicle	Length	2.65	2.10	2.80
	Width	1.40	0.75	1.40
	Height	1.37	0.95	1.40
Aculeus	Length	1.00	0.75	0.90
Femur	Length	3.20	3.10	3.10
	Width	1.25	1.20	1.20
Patella	Length	3.25	3.20	3.45
	Width	1.20	1.25	1.30
Chela	Length	6.70	6.35	7.05
	Width	3.00	2.70	3.05
Movable finger	Length	3.85	3.10	4.00
Pectines teeth		8–9	7–7	8–8

with *Pv* 10/14 are *E. mesotrichus*. According Kinzelbach (1975) *E. tergestinus* is a synonym of *E. mesotrichus*, but the latter name is not available because it is a junior homonym of *E. italicus mesotrichus* Hadži, 1929 (Di Caporiacco 1950; Fet 1997b; Fet and Braunwalder 2000). *E. mesotrichus* was synonymized with *E. tergestinus* by Caporiacco, (1950) and according to Fet and Braunwalder (2000) the correct name for this species should be *E. tergestinus*. Further studies (Gantenbein et al. 2001; Fet et al. 2003) reported that "*E. mesotricus*" of Kinzelbach also refers to other species such as *E. balearicus* and *E. sicanus* besides *E. tergestinus* and other forms that need clarification. *E. carpathicus* s. str. is now restricted to the populations of the type locality in Romania (Fet and Soleglad 2002). Among the specimens studied by Vignoli and Salomone (2008), there is one from Turkey of the AMNH collection labeled as *Euscorpius* cf. *tergestinus* (1 juvenile, Aydın Davutlar, Söke 44 m a.s.l., 28.IV.2005, H. Koç coll.) from the same population as presented in this study as a new species. The specimens of our study certainly do not fall within the range of *E. mesotrichus*

"of Kinzelbach" nor in *E. carpathicus* s. str. and *E. tergestinus* s. str., as we shall see from morphological and trichobothrial data below.

Euscorpius oglasae has a trichobothrial pattern that is almost identical to *Euscorpius avcii* sp. n., but the morphology and geographic distribution (*E. oglasae* is endemic to the island of Montecristo in the Tyrrhenian Sea in Tuscany, Italy) make easy to separate these two species. *E. oglasae* is larger than *Euscorpius avcii* sp. n. (up to 43 mm) (Vignoli et al. 2007), the lobe of the movable finger is weak in males and obsolete in females, the chela is slender, whereas *Euscorpius avcii* sp. n. has a very pronounced lobe on movable finger and the notch on fixed finger and the chela is stocky. The DPS is more developed in *E. oglasae* as well as the granulation and metasomal carinae. *E. oglasae* has a lower pectinal teeth count, 7–7 in males and 6–6 females, whereas *Euscorpius avcii* sp. n. has 8–8 in males and 7–7 in females.

Samos is a Greek island inhabited by an unnamed oligotrichous form, similar to *Euscorpius avcii* sp. n. The Samos population is characterized by small size, stocky pedipalps and trichobothrial pattern *Pv* = 5 and *et* = 5 (Vignoli and Salomone 2008). This form therefore seems to have a lower *Pv* count and *et* constant (*Euscorpius avcii* sp. n. has *Pv* = 7 and *et* = 5/6). Samos Island is very close to the Dilek Peninsula (in some places less than two kilometers), therefore a relationship could be possible between these two populations, but because of the lack of information about the Samos form, we cannot discuss its taxonomical relationship to *Euscorpius avcii* sp. n.

E. tergestinus s. str. is easily distinguished from *Euscorpius avcii* sp. n., even if the color and the trichobothrial pattern *eb* = 4, *eba* = 4, *em* = 4 may suggest that *Euscorpius avcii* sp. n. is a species belonging to the *"tergestinus* complex", but these are the only similar characters, in fact the morphology and the chaetotaxy reveal the great differences between these two species. *E. tergestinus* is larger in size (30-40 mm), it has a slender habitus with elongated pedipalps and DPS strongly developed, among the largest in the entire genus *Euscorpius*.

Its telson is very swollen, above average in both male and female. The metasomal carinae are much more pronounced, granulated and *Euscorpius avcii* sp. n. has a less swollen telson and the metasomal carinae almost smooth. The pedipalpal chela of *E. tergestinus* is slender and long, especially the fingers. In this species, trichobothrium *db* on the fixed finger is much more distal than in *Euscorpius avcii* sp. n. that has it in proximal position.

E. tergestinus has a more granulated carapace, and body, and developed furrows on the carapace whereas *Euscorpius avcii* sp. n. has almost smooth carapace, and body, with weak furrows, causing the appearance of a fairly flat carapace. The trichobothrial pattern of the pedipalp patella of *E. tergestinus* is reported as *Pv* = 7/11 (9), *Pe-et* = 5/8 (6 +) in Fet and Soleglad (2002). Based on this data, *Euscorpius avcii* sp. n. would fall within its range, but it actually does not. Fet and Soleglad (2002) synonymized *E. carpathicus oglasae*, with its low trichobothrial values, with *E. tergestinus*, but Vignoli et al. (2007) raised *E. oglasae* to the rank of species, therefore the range of *E. tergestinus* is *Pv* = 8/11 (9), *Pe-et* = 6/8 (6 +) (Tropea 2012). In fact, this species presents lowest values (*Pv* = 8, *Pe-et* = 6) in populations in central Italy (*E. carpathicus picenus, E. c. apuanus*,

Table 2. Trichobothrial counts of *Euscorpius* species discussed in this paper.

Species	*vP*	*tPe - e*	*tPe - es*	*mPe - e*	*bPe - es*	*aPe - eb*	*bPe - e*
E. avcii sp. n.	7	5–6	4	4	2	4	4
E. oglasae	7	5	4	4	2	4	4
E. koschewnikowi	8	5–6	4	4	2	4	4
E. sp. from *"Samos"*	5	5	4	4	2	4	4
E. c. aegaeus	7–8(8)	5/6(6)	4	4	2	4	4
E. c. ossae	6–8(7/8)	5	4	4	2	4	4
E. c. scaber	7–10(8/9)	6	4	4	2	4	4
E. c. candiota	9–10	6–7	4	4	2	4	4
E. tergestinus	8–11(9)	6–8(6)	4	4	2	4	4
E. carpathicus s.str.	7–9 (8)	5–7 (7)	4	3	2	4	4

of Di Caporiacco, (1950)), however normally its trichobothrial numbers are *Pv* = 9 and *Pe-et* = 6. These values increase toward the northeast of Italy and in the Balkans (Tropea 2012), but they are never less, therefore *Euscorpius avcii* sp. n. does not share the trichobothrial range of *E. tergestinus* s. str.

Other species and subspecies of subgenus *Euscorpius* s.str. that are relatively geographically close, from the Aegean area: *Euscorpius sicanus* (C. L. Koch, 1837)*, E. koshewnikowi* Birula, 1900, *E. carpathicus candiota* Birula, 1903*, E. c. ossae* Di Caporiacco, 1950*, E. c. aegaeus* Di Caporiacco, 1950 and *E. c. scaber* Birula, 1900. *E. sicanus* has never been reported in Turkey; furthermore, it is easy to separate because of its particular trichobothrial pattern; *Pe*: *eb*=5 and *eba* = 4/5 (Fet et al. 2003; Vignoli and Salomone 2008, Tropea 2012). *E. koschewnikowi* has been well redescribed by Fet and Soleglad (2002) as a species quite large in size and medium to dark brown colored, exceptionally smooth, with all segments of the metasoma longer than wide, and DPS highly developed. The description of this species contrasts completely with *Euscorpius avcii* sp. n. because the latter is a small species, colored clear reddish brown, squat, with DPS very weakly developed, and not all metasomal segments are longer than wide. *E. c. candiota,* among other differing characters, has a higher trichobothrial pattern as well as *E. c. aegaeus* (Fet 1985; Di Caporiacco 1950), whereas *E. c. ossae* is overall blackish with legs and telson slightly lighter and larger size (up to 37 mm) (Di Caporiacco 1950).

E. c. scaber is a scorpion from the northern Aegean area, has a dark coloration with a high number of pectinal teeth, a higher trichobothrial pattern, and in addition, its whole body is covered with granules of various size, as also the name suggests, whereas *Euscorpius avcii* sp. n. has a light coloration, and its granulation is very little accentuated, almost smooth.

In our opinion, *Euscorpius avcii* sp. n. is well divided from all described *Euscorpius* forms including those that await taxonomic clarification. At present there are no described species or subspecies that corresponds to the morphology and to the tricho-

bothrial pattern of this new species. We are confident that these data are enough to describe this form as a new species of the genus *Euscorpius*, and the first described species of the subgenus *Euscorpius* in Turkey.

Ecology

Specimens of *Euscorpius avcii* sp. n. were collected from the northern side of Dilek Peninsula (Fig. 7). Vegetation in this area is composed of both deciduous forest (*Quercus cerris*, *Tilia rubra* subsp. *caucasica*, *T. argentea* and *Castanea sativa*) and evergreen forest (which are *Pinus brutia* and *Laurus nobilis*). Coastal areas include scrub vegetation. Furthermore, northern side of Dilek Peninsula has a humid climate and in both summer and winter, flowing streams and wetlands exist. Specimens of *Euscorpius avcii* sp. n. were collected during the day under bark of decomposed wood, under stones and in rock crevices and at night with UV light from rocky places, roadsides and under pine forests (Fig. 8 and 9). *Euscorpius avcii* sp. n. specimens are sympatric with *Mesobuthus gibbosus* Brullé, 1832 and *Iurus kinzelbachi* Kovarik, Fet, Soleglad, Yagmur, 2010. We report an example of intraguild predation, we witnessed *Mesobuthus gibbosus* feeding on *Euscorpius avcii* sp. n. during one of our night trips (Fig. 10).

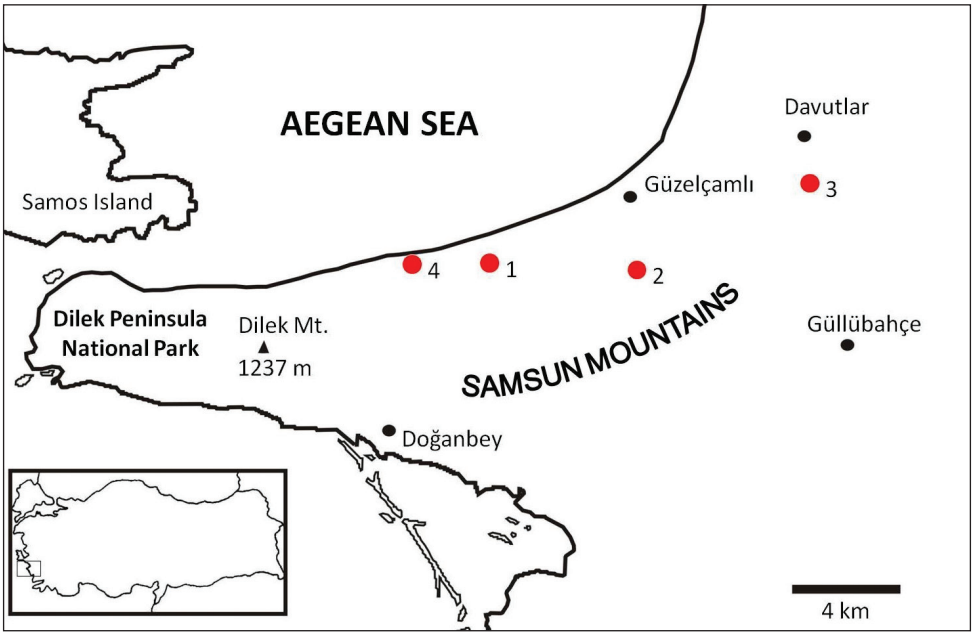

Figure 7. Map of Dilek Peninsula National Park

Figure 8. The habitat in Canyon in Dilek Peninsula National Park

Figure 9. The habitat in North of Güzelçamlı in Dilek Peninsula.

Figure 10. A *Mesobuthus gibbosus* which feeds on *Euscorpius avcii* sp. n.

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