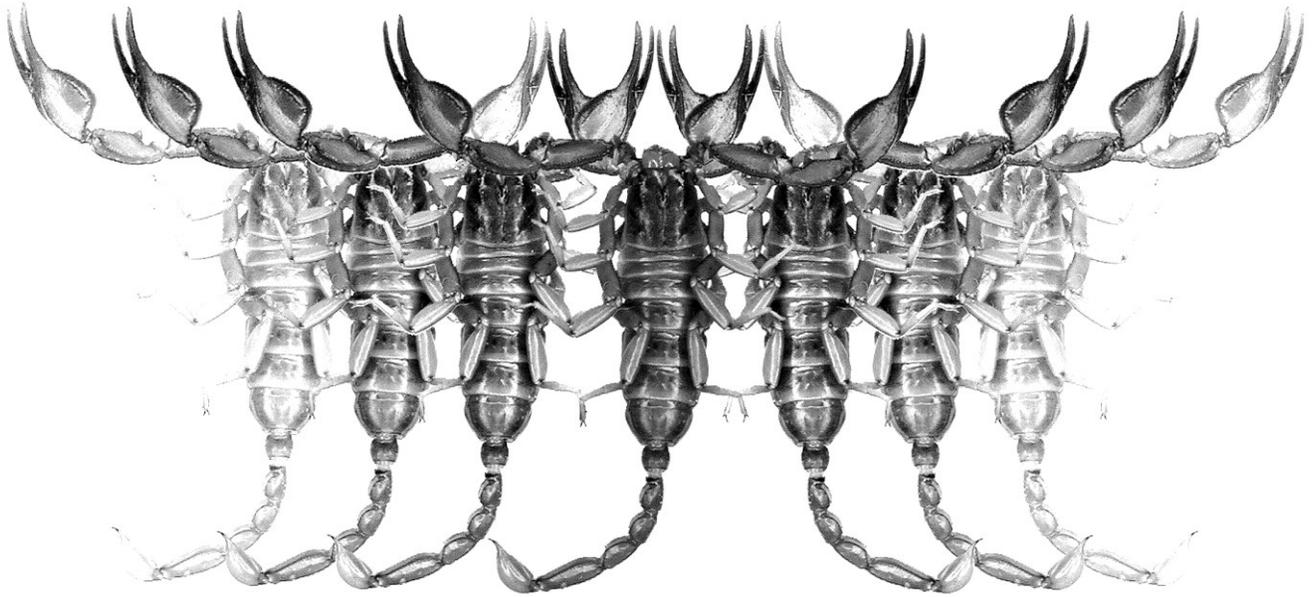


# *Euscorpilus*

Occasional Publications in Scorpiology



**A New Species of *Euscorpilus* Thorell, 1876 from the Antalya Province, Southern Turkey (Scorpiones: Euscorpidae)**

**Gioele Tropea, Ersen Aydın Yağmur & Fatih Yeşilyurt**

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# *Euscorpius*

## Occasional Publications in Scorpiology

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### *Derivatio Nominis*

The name *Euscorpius* Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpiidae).

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## A new species of *Euscorpius* Thorell, 1876 from the Antalya Province, southern Turkey (Scorpiones: Euscorpiidae)

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### Summary

A new scorpion species, *Euscorpius gocmeni* sp. n., is described based on specimens collected from the Antalya Province (Akseki District) in southern Turkey. It is characterized by a high trichobothrial count ( $Pv = 11-13$ ,  $et = 7-8$ ,  $em = 4$ , and  $eb = 4$ ), a high pectinal teeth count ( $Dp = 10-12$  in males,  $8-9$  in females), medium-small size, and light to medium brown-reddish color.

### Introduction

The genus *Euscorpius* Thorell, 1876 is one of the most studied groups of scorpions, and very common in southern Europe and Anatolia. Its species occupy diverse habitats from the sea level up to over 2,000 m a.s.l. Taxonomy of this genus is complicated and still unresolved throughout its range, due to inaccurate old descriptions, lost type specimens, and lack of specimens from many areas. In addition, taxonomic studies are hindered by existence of cryptic species complexes, which are difficult to resolve even with phylogenetic analysis based on DNA markers (see e.g. Parmakelis et al., 2013; Tropea et al., 2014). The *Euscorpius* populations of Turkey have been poorly studied in past, but in the last years several studies delineated various forms of this genus (e.g., Fet et al., 2003; Karataş, 2006; Tropea et al., 2012; Yağmur & Tropea, 2013; Yağmur et al., 2013). At present, only five valid species are recognized in Turkey (not including the new species): *E. italicus* (Herbst, 1800); *E. mingrelicus* (Kessler, 1874); *E. avcii* Tropea, Yağmur, Koç et Yeşilyurt, 2012; *E. rahsenae* Yağmur et Tropea, 2013; and *E. lycius* Yağmur, Tropea et Yeşilyurt, 2013. *E. mingrelicus*, which is a species complex, has six described 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 subgenus *Euscorpius* in Turkey have been reported many times under the name of *E. carpathicus* (L., 1767) or *E. carpathicus* “complex” from several places. However, considering some pre-

liminary genetic data plus the data on nearby Greek populations of Parmakelis et al. (2013), it is presumed that these populations are very distant from the *E. carpathicus* s.str. and the subgenus *Euscorpius* (= *E. carpathicus* “complex”). The new species described herein, *Euscorpius gocmeni* sp. n., is the sixth valid species of genus *Euscorpius* recognized in Turkey.

### Materials and Methods

The trichobothrial notations follow Vachon (1974). The morphological measurements are given in millimeters (mm) following principally Sissom et al. (1990); however, due to the morphology of the genus *Euscorpius* and preferences of the authors, some modifications are given in Figures 30–40. The morphological nomenclature follows Stahnke (1970), Hjelle (1990), and Sissom (1990); the chela carinae and denticle configuration follow Soleglad & Sissom (2001); and sternum terminology follows Soleglad & Fet (2003).

### Material examined

A total of 18 specimens of *Euscorpius gocmeni* sp. n. have been examined (see *Type Material*). The specimens and species listed below have also been examined for comparison:

*E. avcii*: 1 ♂, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası, Aydın, Turkey, 7 October 2005, leg. H. Koç (MTAS; holotype); 1 ♂, 5 ♀, Dilek Peninsula National Park, Canyon, Dilek Peninsula, near Davutlar Town, Kuşadası District, Aydın Province, Turkey, 7 October



Figures 1–2: *Euscorpium gocmeni* sp. n., male, dorsal and ventral views.

2005, leg. H. Koç (MZUF; paratypes); same label data, 1 ♂, 2 ♀ (GTC).

*E. lycius*: 1 ♂, Turkey, Muğla Province, Fethiye District, Faralya Village, 36°29'37"N, 29°08'07"E, 349 m, 30 May 2012, leg. F. Yeşilyurt & E. A. Yağmur (AZM; holotype); 3 ♀, 4 ♂, Muğla Province, Fethiye District, Faralya Village, 36°29'37"N, 29°08'07"E, 349 m, 30 May 2012, leg. F. Yeşilyurt & E. A. Yağmur (KUAM; paratypes); same label data but 1 ♀, 1 ♂ (AZM), 2 ♀, 2 ♂ (GTC), 1 ♀, 1 ♂ (MSNB).

*E. rahsenae*: 1 ♂, Tirilye Village, Mudanya District, Bursa Province, Turkey, 40°23'08.9"N, 28°48'20.9"E, 39 m, Red Pine Forest, 6 July 2012, leg. R.S. Kaya & H. Koru (AZM; holotype); 1 ♀, Beşevler Neighborhood, Nilufer District, Bursa Province, 40°11'47"N, 28°57'58"E, 153 m, 5 May 2005, leg. R.S. Kaya (AZM; para-

types); 3 ♀, Yalıciftlik Village, Ruined Building, Mudanya District, Bursa Province, 40°21'16"N, 28°42'58"E, 97 m, 21 April 2012, leg. H. Koru (AZM); 1 ♂, 1 ♀, Tirilye Village, Mudanya District, Bursa Province, 40°23'08.9"N, 28°48'20.9"E, 39 m, 17 June 2012, leg. E.A. Yağmur & R.S. Kaya (GTC; paratypes).

#### Abbreviations

Abbreviations: *V*: trichobothria on pedipalp chela manus ventral surface; *Pv*: trichobothria on patella ventral surface; *Pe*: trichobothria on pedipalp patella external surface; *et*: external terminal; *est*: external sub-terminal; *em*: external medium; *esb*: external suprabaasal; *eba*: external basal *a*; *eb*: external basal; *db*: dorsal basal trichobothrium on fixed finger; *Dp*: pectinal teeth num-



Figures 3–4: *Euscorpius gocmeni* sp. n., female, dorsal and ventral views.

ber; *L*: length; *H*: height; *Lchel*: chela length; *Wchel-A*: chela width; *Wchel-B*: width of the chela with vertical finger alignment; *Lcar*: carapace length; *Wcar*: carapace width; *Lfem*: femur length; *Lpat*: patella length; *Lmet*: metasoma length; *met.seg*: metasomal segment; *CarA–CarP* %: average ratio of distances from center of median eyes to anterior and posterior margins of the carapace; *DPS*: dorsal patellar spur; *DD*: distal denticle; *MD*: median denticles; *OD*: outer denticles; *ID*: inner denticles; *IAD*: inner accessory denticles.

AZM: Zoology Museum of Alaşehir Vocational School, Celal Bayar University, Manisa, Turkey; GTC: private collection of Gioele Tropea, Rome, Italy; KUAM: Arachnological Museum of Kırıkkale University, Kırıkkale, Turkey; MSNB: Museo Civico di Scienze Naturali “E. Caffi”, Bergamo, Italy; MTAS: Museum of the Turkish Arachnological Society, Ankara, Turkey; MZUR: Museo di Zoologia “Charles Darwin” dell’Università di Roma “La Sapienza”, Rome, Italy;

ZMSU: Zoology Museum of Sinop University, Sinop, Turkey.

### Systematics

#### Family Euscorpiidae Laurie, 1896

#### Genus *Euscorpius* Thorell, 1876

#### Subgenus Incertae Sedis

#### *Euscorpius gocmeni* Tropea, Yağmur et Yeşilyurt, sp. n.

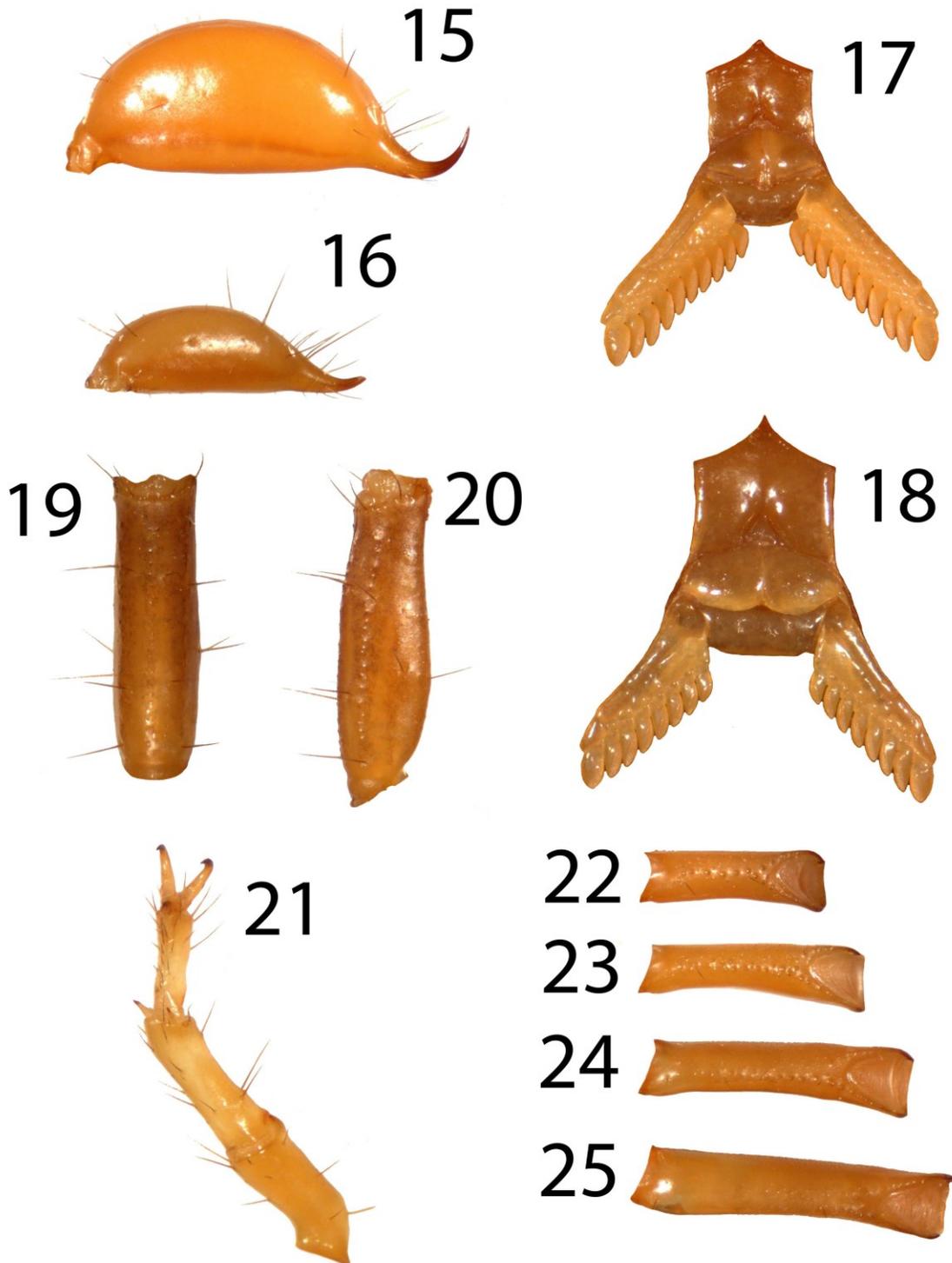
(Figs. 1–26, Table 1)

<http://zoobank.org/urn:lsid:zoobank.org:act:2A645E D5-F5D1-4A9C-A543-E2E5874C3670>

**Type material.** *Holotype*: ♂, Turkey, Antalya Province, Akseki District, Murtıçı Village, 36°51'52.8"N, 31°45'02.9"E, 495 m, 1 September 2011, leg. F. Yeşilyurt & E. A. Yağmur (AZM).



**Figures 5-14:** *Euscorpium gocmeni* sp. n. 5. Carapace. 6. External view of chela of the adult male. 7. External view of chela of the adult female. 8. External view of pedipalp patella. 9. Ventral view of pedipalp femur. 10. Dorsal view of pedipalp femur. 11. Dorsal view of pedipalp patella. 12. Ventral view of pedipalp patella. 13. Ventral view of chela. 14. Dorsal view of chela.



**Figures 15–25:** *Euscorpius gocmeni* sp. n. 15. Telson of adult male. 16. Telson of adult female. 17. Sternopectinal area of adult male. 18. Sternopectinal area of adult female. 19. Ventral view of the metasomal segment V. 20. Latero-dorsal view of the metasomal segment V. 21. Tarsus and basitarsus of leg IV. 22. Leg femur I. 23. Leg femur II. 24. Leg femur III. 25. Leg femur IV.

*Paratypes:* 5 ♂ (2 adults and 3 immature), 1 ♀ (immature), Turkey, Antalya Province, Akseki District, Murtiçi, 36°51'52.8"N, 31°45'02.9"E, 495 m, 3 August

2013, leg. E. A. Yağmur and E. Tezcan (AZM); same data but 2 ♂, 1 ♀, (GTC); 4 ♂, 2 ♀, Turkey, Antalya Province, Akseki District, Murtiçi, 36°51'52.8"N, 31°

<i>Euscorpium gocmeni</i> sp. n.			
		<i>Holotype</i> ♂	<i>Paratype</i> ♀
<b>Total</b>	<b>Length</b>	29.85	24.95
<b>Carapace</b>	<b>Length</b>	4.26	4.20
	<b>Post. width</b>	4.08	4.02
<b>Metasoma</b>	<b>Length</b>	11.22	9.23
<b>Segment I</b>	<b>Length</b>	1.32	1.19
	<b>Width</b>	1.32	1.23
<b>Segment II</b>	<b>Length</b>	1.62	1.41
	<b>Width</b>	1.15	1.07
<b>Segment III</b>	<b>Length</b>	1.85	1.59
	<b>Width</b>	1.11	0.96
<b>Segment IV</b>	<b>Length</b>	2.22	1.92
	<b>Width</b>	1.04	0.90
<b>Segment V</b>	<b>Length</b>	3.78	3.12
	<b>Width</b>	1.14	0.90
<b>Telson</b>	<b>Length</b>	4.29	3.12
<b>Vesicle</b>	<b>Length</b>	3.33	2.04
	<b>Width</b>	1.56	0.90
	<b>Height</b>	1.74	0.90
<b>Aculeus</b>	<b>Length</b>	0.96	1.08
<b>Femur</b>	<b>Length</b>	3.78	3.66
	<b>Width</b>	1.32	1.32
<b>Patella</b>	<b>Length</b>	3.71	3.54
	<b>Width</b>	1.44	1.44
<b>Chela</b>	<b>Length</b>	7.38	7.20
	<b>Width-A</b>	3.07	2.70
<b>Movable finger</b>	<b>Length</b>	4.20	3.90
<b>Ratios</b>	<b>CarA – CarP (%)</b>	43.66 – 56.34	42.86 – 57.14
	<i>Lcar/Wcar</i>	1.044	1.045
	<i>Lcar/Lfer</i>	1.127	1.147
	<i>Lcar/Ltel</i>	0.993	1.346
	<i>Lchel/Wchel-A</i>	2.402	2.666
	<i>L/W met.seg I</i>	1.000	0.966
	<i>L/W met.seg II</i>	1.413	1.320
	<i>L/W met.seg III</i>	1.665	1.656
	<i>L/W met.seg IV</i>	2.138	2.133
	<i>L/W met.seg V</i>	3.316	3.466
	<i>Lmet/met.seg V</i>	2.968	2.959
	<i>Lmet/Lcar</i>	2.634	2.198
	<i>Lfem/Lpat</i>	1.020	1.034

**Table 1:** Measurements (mm) and morphometric ratios of *Euscorpium gocmeni* sp. n.

45°02.9"E, 495 m, 1 September 2011, leg. F. Yeşilyurt & E. A. Yağmur (AZM); same data but 1 ♂ (GTC); 1 ♂, Turkey, Antalya Province, Akseki District, Irmasan Pass, 1450–1525 m, 28 April 1982, leg. A. Vigna (MZUR 87).

**Geographic distribution.** Southern Turkey: Antalya Province (see map in Fig. 28).

**Etymology.** The specific epithet honors Dr. Bayram Göçmen, a Turkish herpetologist.

**Diagnosis.** A medium small *Euscorpium* species, total length 25–30 mm (average 27.29 mm). Color very light brownish-ivory to brownish-reddish with darker chelae, without marbling. The mesosoma may be more dark, greyish, due to the translucent cuticle. Number of tricho-



**Figure 26:** A live male of *Euscorpium gocmeni* sp. n.

bothria on pedipalp manus ventral surface is 4 (3  $V + Et_1$ ). Trichobothrium *et* on fixed finger is located distally to the notch of the fixed finger; *est* is located proximally or above the notch; and *dsb* is located proximally to the notch. Number of trichobothria on the pedipalp patella ventral surface usually is 11 to 12 (10 in 2.78 %, 11 in 38.89 %, 12 in 50 % and 13 in 8.33 % of pedipalps examined). Number of trichobothria on pedipalp patella external surface is: *eb* = 4, *eb<sub>a</sub>* = 4, *esb* = 2, *em* = 4, *est* = 4, *et* = 7 to 8 (series *et* = 7 in 36.11 %, 8 in 61.11 % of pedipalps examined). Pectinal teeth count is 10 to 12 in males (10 in 46.15 %, 11 in 42.31 % and 12 in 11.54 % of the pectines examined) and usually 8 in females (8 in 75.00 % and 9 in 25.00 % of the pectines examined). Chela with a well-developed notch on fixed finger and lobe on movable finger in males, obsolete in females. *Lchel/Wchel* ratio is 2.521 in males and 2.745 in females. Dorsal patellar spur well-developed. Femur longer than patella; *Lfem/Lpat* ratio is 1.042. Carapace may be slightly longer than wide to slightly wider than long; average ratio *Lcar/Wcar* 1.006; average distance from center of median eyes to anterior margin of the carapace is 42.46 % of the carapace length. Average

distance from center of median eyes to posterior margin of the carapace is 57.54 % of the carapace length. Average ratio of *Lmet/Lcar* is 2.555 in males and 2.198 in females.

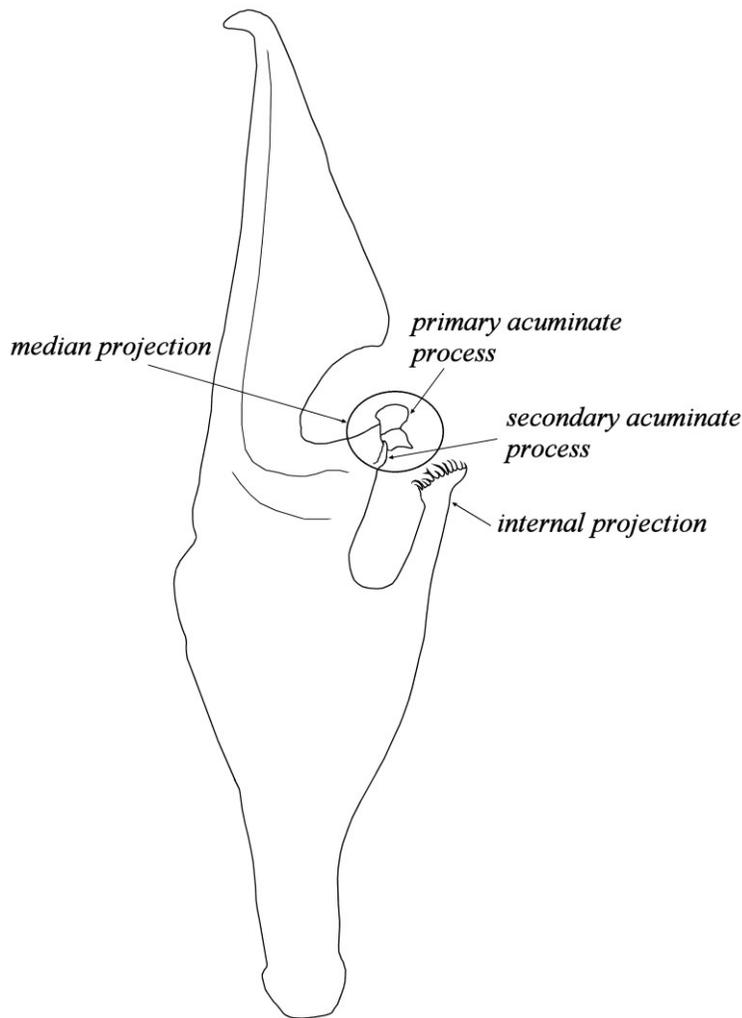
**Trichobothrial and pectinal teeth count variation.** Variation observed in 18 studied specimens (14 males, 4 females) is given below.

*Pectinal teeth, males* (n=14): 10/10 (5), 4/11 (1), 10/11 (1), 11/? (1), 11/10 (1), 11/11 (3), 12/11 (1), 12/12 (1); in total, 10 in 46.15 %, 11 in 42.31 % and 12 in 11.54 %; mean = 10.65, SD = 0.67

*Pectinal teeth, females* (n=4): 8/8 (3), 9/9 (1); in total, 8 in 75 %, 9 in 25.50 %; mean = 8.25, SD = 0.43.

*Pedipalp patella, ventral trichobothria Pv* (n=18): 11/10 (1), 11/11 (6), 11/12 (1), 12/12 (7), 12/13 (1), 13/12 (2); in total, 10 in 2.78 %, 11 in 38.89 %, 12 in 50 % and 13 in 8.33 %; mean = 11.64, SD = 0.67.

*Pedipalp patella, external trichobothria Pe* (n=18): *et* = 6/7 (1), 7/7 (4), 8/7 (4), 8/8 (9); in total, 6 in 2.78 %, 7 in 36.11 %, 8 in 61.11 %; mean = 7.58, SD = 0.55; *est* = 4/3 (1), 4/4 (17); *em* = 4/4 (18); *esb* = 2/2 (18); *eb<sub>a</sub>* = 4/4 (18); *eb* = 4/4 (18).



**Figure 27:** Hemispermatophore of *Euscorpium gocmeni* sp. n.

**Hemispermatophore.** Both right and left hemispermatophore of 4 specimens were studied. They have a well-developed lamina tapered distally; well-developed basal constriction present; truncal flexure present; median projection with primary and secondary acuminate processes; internal projection distally show 8–13 tines in its crown. The number of tines of the crown may differ between specimens and between the right and the left hemispermatophores.

#### **Description of the male holotype**

**Coloration:** General color light brownish to brownish-reddish with darker chelae, without marbling; sternites brownish, pectines and genital operculum whitish/light brownish; chelicerae very light brownish/yellowish with marbling; telson yellowish with dark reddish aculeus tip.

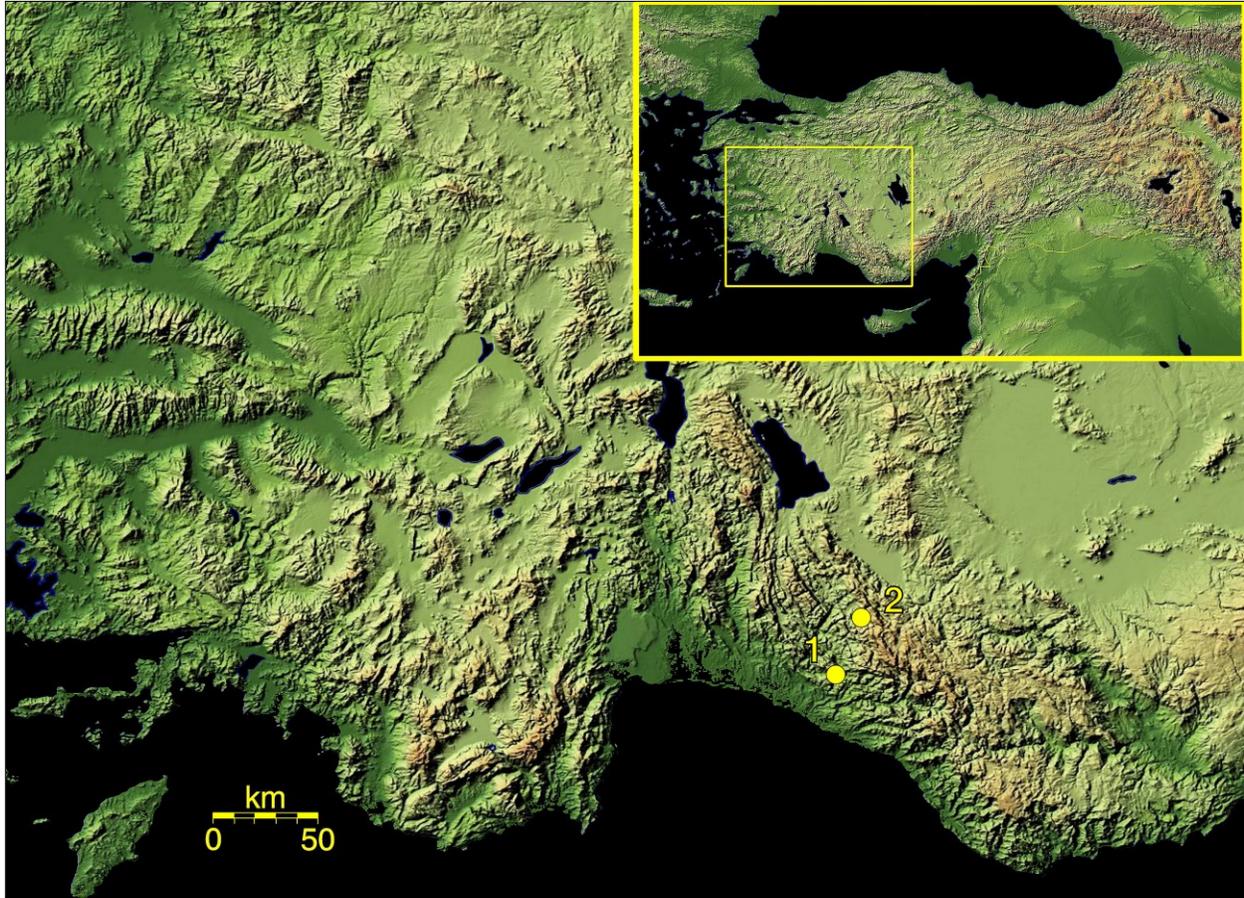
**Carapace:** Fine granulation on most surfaces, with a few slightly larger granules along the anterior lateral area behind the lateral eyes; anterior edge granulate in lateral area and more or less straight; posterior lateral,

posterior median end anterior median furrows present; two pairs of lateral eyes (anterior eye is visible larger), and a pair of median eyes, situated distally of the middle; length from center of median eyes to anterior margin is 43.66% of carapace length; length from center of median eyes to posterior margin is 56.34% of the carapace length.

**Mesosoma:** Tergites very finely granulated; sternites glossy and finely punctuated; small spiracles inclined to about 45° downward towards outside; area of overlap between sternites paler.

**Metasoma:** Dorsal carinae on segment I–IV with low spaced granules, just on distal area a bit more marked; ventrolateral carinae absent or obsolete on segments I–IV, with small spaced granules on segment V; ventromedian carina absent on segments I–IV, with small spaced granules on segment V; intercarinal spaces mostly smooth, only the dorsal surface has a very fine roughness.

**Telson:** Vesicle punctuated and rough, with ventral setae of different size, especially near the vesicle/aculeus juncture; *L/H* ratio of the vesicle 1.914.



**Figure 28:** Sampling map of *Euscorpium gocmeni* sp. n. 1. Murtiçi Village. 2. Irmasan Pass.

**Pectines:** Teeth count 11/10; 7/6 middle lamellae; several microsetae on proximal area of teeth, marginal lamellae, middle lamellae, and fulcra.

**Genital operculum:** The genital operculum is formed by two longitudinally separate subtriangular sclerites; genital papillae distally protruding; a few microsetae present.

**Sternum:** Pentagonal shape, type 2; similar length and width, with a deep posterior emargination.

**Pedipalps:** Coxa and trochanter with tuberculate carinae. Femur: dorsal internal carinae tuberculate; dorsal external carinae formed by tubercles slightly spaced and serrulated; external median carinae serrulate; ventral internal carinae tuberculate; ventral external carinae formed by spaced tubercles, well formed only in the proximal 1/3; anterior median formed by marked conical tubercles, varying in size, near at three great and well marked are present three macroseta; dorsal intercarinal spaces granulated with granules of varying size; ventral intercarinal spaces not uniformly granulated, with larger granules near the ventral carinae. Patella: dorsal internal carinae tuberculate; dorsal external carinae irregular, rough to smooth; ventral ex-

ternal carinae crenulated; ventral internal carinae tuberculate to lightly serrulate; dorsal and ventral intercarinal surface rough with few scattered minute granules. Dorsal patellar spur well-developed. Chela: chela with a well-developed notch on fixed finger and lobe on movable finger; Chelal carina *DI* is distinct, strong, dark and from smooth to rough; *D4* is rounded and rough; *VI* is distinct, strong, dark and smooth; *V3* rounded, dark and lightly and finely granulated; external carina irregular, granulated to rough; intercarinal tegument rough to finely granulated with very minute scattered granules. Typical *Euscorpium* chela finger dentition; *L/W* ratio of the chela 2.40; *Lfem/Lpat* ratio is 1.02.

**Trichobothria:** Chela: trichobothria on the pedipalp manus ventral surface is 4/4 ( $V_{1-3} + Et_1$ ); trichobothrium *et* on fixed finger is located distally to the notch of the fixed finger; *est* is located proximally or above the notch; and *dsb* is located proximally to the notch. Patella: ventral (*Pv*): 12/12; patella external (*Pe*): *et* = 8/8, *est* = 4/4, *em* = 4/4, *esb* = 2/2, *eba* = 4/4, *eb* = 4/4. Femur: trichobothrium *d* is slightly proximal to *i*, while trichobothrium *e* is distal to both *d* and *i*; it is situated on



**Figure 29:** Habitat near Murtiçi Village.

dorsal external carina but is shifted toward its dorsal surface.

**Legs:** Legs with two pedal spurs; no tarsal spur; ventral row of tarsus III with a total of 9/9 spinules, of increasing size from proximal to distal, ending with a decentralized spinule; 3 flanking pairs of tarsal setae adjacent to the ventral spinules row. Granulation well present on dorsal and ventral surface of leg femora, mostly marked and dark ventrally.

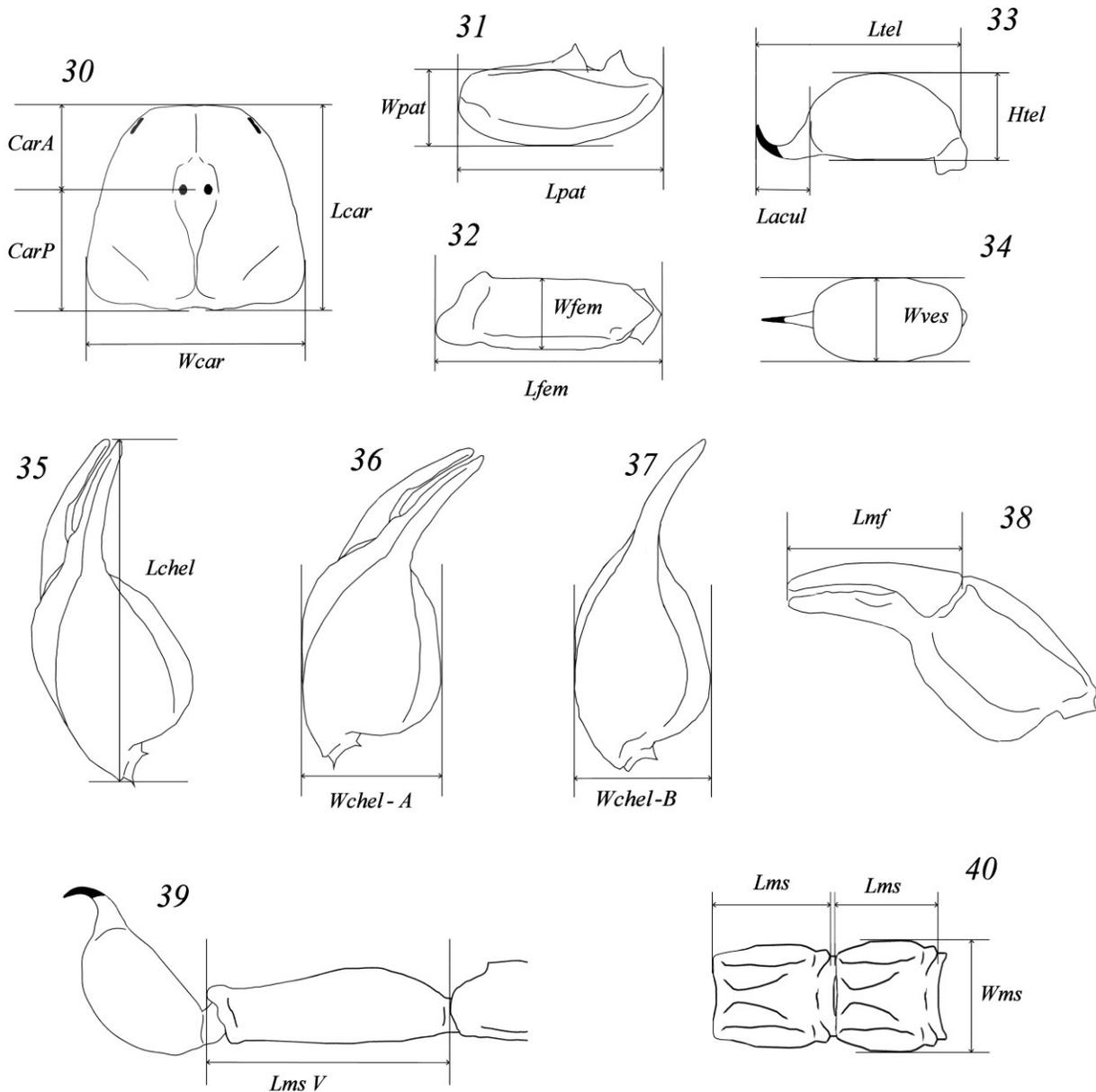
**Chelicerae:** Smooth, without marbling, with slight darker apical portion of denticles. Movable finger: the dorsal distal denticle is much smaller than the ventral distal denticle; ventral edge is smooth with brush-like setae on the inner part; dorsal edge has five denticles: one large distal, one medium and one small subdistal, one large median and a small basal. Fixed finger with four denticles: one distal, one subdistal, one median and one basal, the last two in a fork arrangement; the internal surface has brush-like setae.

## Comparisons

*E. gocmeni* sp. n. is easily distinguishable from other *Euscorpius* mainly due to the high trichobothrial

and pectinal teeth number, which are the main diagnostic characters for this species. In fact, taking into consideration the species belonging to the subgenus *Euscorpius* and related to it, only *E. balearicus* Di Caporiacco, 1950, *E. feti* Tropea, 2013, *E. hadzii* Di Caporiacco, 1950, some populations of the *E. sicanus* (C. L. Koch, 1837) complex and *E. tergestinus* (C. L. Koch, 1837) may have a  $Pv = 11$  or higher, and of these species,  $Dp = 10$  or higher is found only in *E. hadzii*, some populations of *E. sicanus* complex, and in rare specimens of *E. tergestinus*.

In Turkey there are five species of the genus *Euscorpius* (not including the new species). Of these, *E. (Polytrichobothrius) italicus* is easily recognizable by a trichobothrial number on pedipalp manus ventral surface higher than 6; and *E. (Alpiscorpius) mingrelicus* complex, by the trichobothrial series  $em = 3$  on pedipalp patella external surface. The remaining three species, *E. avcii*, *E. rahsenae*, and *E. lycius*, are similar to the forms of subgenus *Euscorpius*. However, the scope and the diagnostic characters to the subgenus *Euscorpius* are currently not defined as this traditional subgenus appears to be paraphyletic (Tropea, 2013; Pamakelis et al.,



**Figures 30–40:** Measurement methods. **30.** Carapace: *Lcar* = length of the carapace; *Wcar* = posterior width of the carapace; *CarA* = anterior portion of the carapace; *CarP* = posterior portion of the carapace. **31.** Patella, dorsal view: *Lpat* = length of the patella; *Wpat* = width of the patella. **32.** Femur, dorsal view: *Lfem* = length of the pedipalp femur; *Wfem* = width of the pedipalp femur. **33.** Telson: *Ltet* = length of the telson; *Htet* = height of the telson (or vesicle); *Lacul* = length of the aculeus. **34.** Telson, ventral view: *Wves* = width of the vesicle (or telson). **35.** Chela, dorsal view: *Lchel* = length of the chela. **36.** Chela, dorsal view: *Wchel-A* = width of the chela, measured with both *V1* and *V3* carinae positioned in the horizontal plane. **37.** Chela, dorsal view (after Sissom, 1990): *Wchel-B* = width of the chela with vertical finger alignment. **38.** Chela, ventral view: *Lmf* = length of the movable finger. **39.** Metasoma segment V, lateral view: *Lms V* = length of segment V of the metasoma, from the most distal part of segment V to the most distal part of segment IV. **40.** Metasoma segments I to IV, dorsal view: *Lms* = segment length; *Wms* = segment width.

2013). Therefore, three above mentioned Turkish species, as well as *E. gocmeni* sp. n., are not assigned to any subgenus at this moment. The new species, *E. gocmeni* sp. n., can be mainly distinguished from these species by: **(1)** higher trichobothrial number which is *Pv* = 11–

12 and *et* = 7–8 in *E. gocmeni* sp. n. vs. *Pv* = 7 and *et* = 5–6 in *E. avcii*, *Pv* = 8 and *et* = 6 in *E. rahsenae*, and *Pv* = 9 and *et* = 6–7 in *E. lycius*; **(2)** higher *Dp* which is 10–12 in males and 8–9 in females of *E. gocmeni* sp. n. vs. 8 in males and 7 in females of *E. avcii*, 9 in males and 7 in

females of *E. rahsenae*, and 8–9 in males and 7 in females of *E. lycius*; (3) *E. gocmeni* **sp. n.** has a *CarA–CarP* average ratio of 42.46%–57.54% vs 39.20%–60.80% in *E. avcii*, 40.30%–59.70% in *E. lycius*, while *E. rahsenae* has a ratio similar to new species, 42.47% – 57.53%.

## Ecology

All specimens in Murtiçi were collected at night time in the Karpuzçay Valley. The Karpuzçay Creek flows along the valley covered with red pine (*Pinus brutia* Ten.) forest. Due to Karpuzçay Creek stream, this valley is a very humid habitat. The specimens have been collected on the rocks and in wall cracks near a road. Due to valley humidity the wall was covered by moss. In our field trips in Turkey, presence of moss is usually an indicator of potential places where specimens of *Euscorpius* could be found. Moss species prefer humid places, and they also capture moisture, providing suitable conditions for *Euscorpius*. Almost all the specimens have been collected at about 500 m a.s.l., but the specimen MZUR 87 has been collected between 1430 and 1525 m a.s.l. We observed that *Neocalchas gruberi* (Fet, Soleglad et Kovařík, 2009) and *Protoiurus kraepelini* (von Ubisch, 1922) (Iuridae), which are hygrophilic scorpions, are sympatric in the Murtiçi area with *E. gocmeni* **sp. n.**

## Conclusions

Taxonomy of the genus *Euscorpius* is complicated and still unresolved throughout its range. In Turkey the genus *Euscorpius* has been poorly studied, especially the populations in previously called *E. carpathicus* or the *E. carpathicus* “complex”. At the same time, they are species that often live in the vicinity of human habitations, and in Turkey they are present mainly in the regions that overlook the Mediterranean Sea. Only recently studies to try to understand the distribution and taxonomic position of these populations have been made and are currently in progress by our team. *E. gocmeni* **sp. n.** is the fourth species in the group close to the subgenus *Euscorpius* in Turkey, and this is in line with the current trend of description of numerous new species, many of them endemic, in the genus *Euscorpius* and other genera of scorpions, but also other animals and plants of the Mediterranean region. In Turkey, complex mountains such as the Taurus form barriers thought to hinder the gene flow and contribute to the differentiation of populations. The new species, *E. gocmeni* **sp. n.**, has clear characteristics that differentiate it easily from the other species of the genus; however, it is currently not possible to suggest its relationship with other *Euscorpius* and its subgeneric position, due to obsolete diagnostic

characters (Tropea, 2013). Further studies, including molecular, are in progress to understand the diversity and distribution of different species and populations of the genus *Euscorpius* in Turkey as well as their relationship with the Greek populations.

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