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The genus *Dolichopoda* in Greece. A description of new species from the Ionian Regions and Peloponnisos (Orthoptera, Rhaphidophoridae)

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Abstract

Description of five new *Dolichopoda* species from the Ionian area of Western Greece together with a description of the female for *D. pavesii* from Kefalonia island and the male of *D. dalensi* from North-eastern Peloponnisos are reported. Considering the other 6 species already documented in the area (including the North of the Peloponnisos), there is now a total of 11 recorded species of *Dolichopoda* which currently inhabit the underground areas of this zone. These new data, therefore, help better define the already high diversity of the genus in the Hellenic region (25 species in all) reinforcing the hypothesis that there was a central area of dispersion of the *Dolichopoda* in the ancient Aegean plate.

Key words: cave cricket**,** *Dolichopoda*, new species, Greece

Introduction

The family Rhaphidophoridae Walker, F., 1871 is divided into nine subfamilies (Gorochov 2001), and is considered by many authors to be as phylogenetically old both for their morphology and their wide, discontinuous, geographic distribution across the temperate areas of the Boreal and Austral hemispheres (Di Russo & Sbordoni 1998).

Members of the subfamily Dolichopodainae Brunner von Wattenwyl, 1888 are restricted to the Northern hemisphere, with several species belonging to the genera *Dolichopoda* Bolivar, I., 1880 which are found in caves of Europe and Asia Minor. In particular, 37 species from the genus *Dolichopoda* have been described (Heller *et al*. 1998, Otte 2000). This genus has its his highest species richness in Southern and South-Eastern Europe (Mediterranean basin, Apennines, Balkan and Peloponnisos). In particular, 20 of the known species known have been reported in for caves in continental and insular Greece (Boudou-Saltet 1983; Willemse 1984) (Tab. 1). Among these, only 4 species have been reported for the western area of Greece (Ionian regions) (i.e. *D. graeca* of Perama cave, Ipiros; *D. steriotisi* of Corfù island; *D. patrizii* of Petalas island; *D. pavesii* of Kefalonia island) and two species from the Northern Peloponnisos (*D. matsakisi* of the Tom Limnon cave near Kalavrita and *D. dalensi* from Kephalovrissi cave in Argolis).

In this paper, we present the description of 5 new *Dolichopoda* species from the Ionian area of Western Greece together with a description of the female for *D. pavesii* from Kefalonia island and the male of *D. dalensi* from North-eastern Peloponnisos.

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***Dolichopoda (Dolichopoda) kiriakii* Rampini, Di Russo sp. nov.**
(Figs 1–9)

Diagnosis. Attributable to the genus *Dolichopoda* Bolivar, 1880, due to the absence of spines on all femora, the occurrence of spines on the fore tibia and a non-bifurcate epiphallus. It can be included in the sub-genus *Dolichopoda* s. str. (Baccetti 1958). The size is relatively large in size big with long the hind legs strongly elongated. The epiphallus elongated but enlarged at the basema base. This species, as with the other Ionian species, is distinguishable due to the occurrence of two evident cyilindrical tubercles on the posterior edges of the tenth tergite. These characters place the new species close to the Ionian species: *D. steriotisi* (Corfù Isl.), *D. pavesii* (Kefalonia Isl.), and to *D. graeca* (Ipiros).

Type locality. The cave is located in Korifè near Aghia Kiriaki village, on the south-eastern slopes of the Parga Mountains. The area is covered by Mediterranean scrub characterized by *Quercus calliprino*.

Etymology. The new species takes its name from the Kiriaki cave.

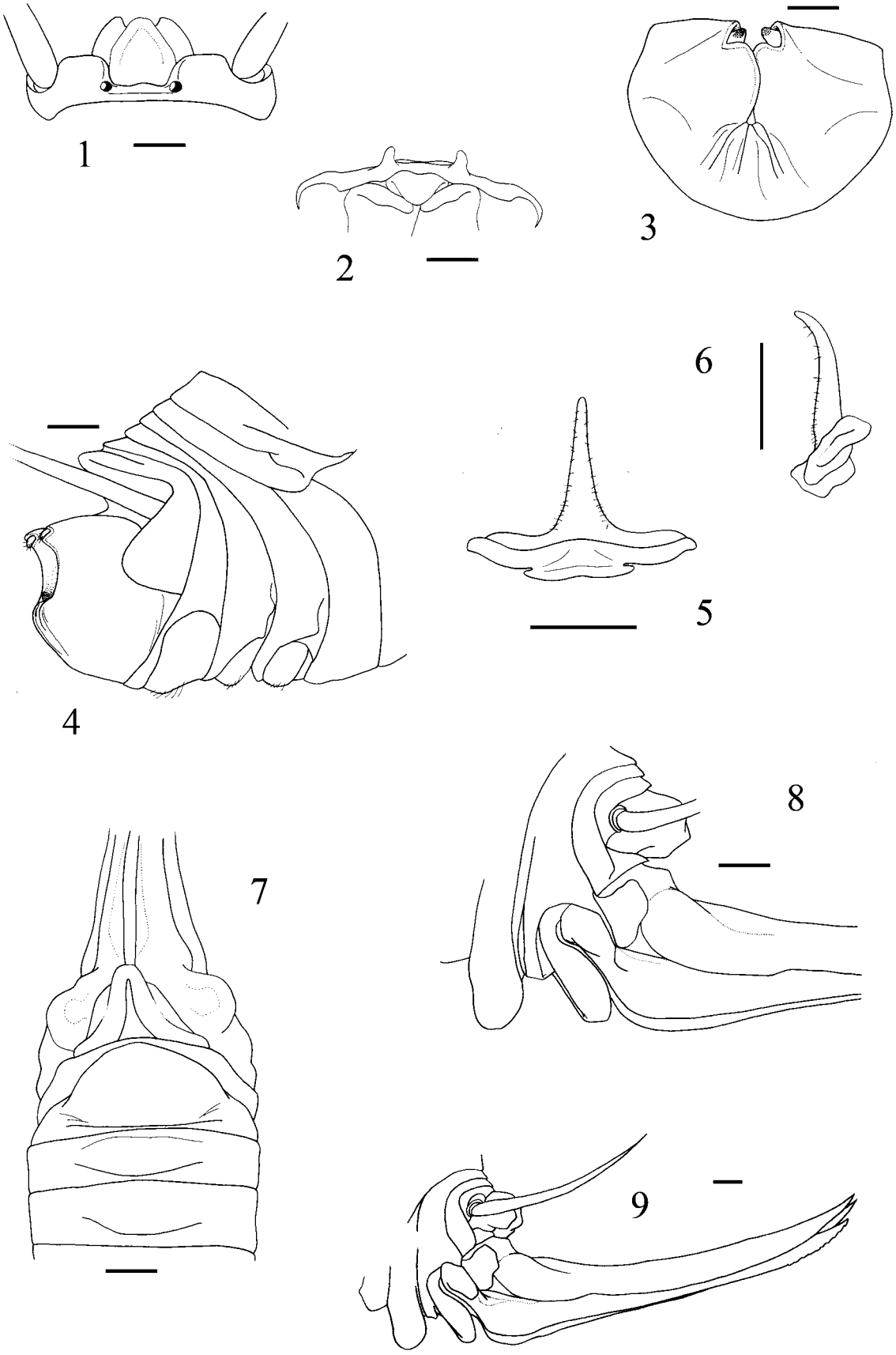
Material examined. Holotypus male, Ipiros, Parga, Aghia Kiriaki vill., A. Kiriaki cave, 270 m a.s.l., lat. 39° 17’10’’N, log. 20°26’60’’ E, 24.IV.06, M. Rampini, G. Pintus, L. Lustri leg. Paratypes: same locality, data and collectors as for holotype, 2 males, 3 females, 1 female nymph (MZUR, PCR).

Depositories. Museum of Zoology, University of Rome “La Sapienza” (MZUR), M. Rampini Private Collection (PCR).

TABLE 1. List of the *Dolichopoda* known species from Greek regions.

	Peloponnisos	Central Greece	Ipiros	Ionian Is.	Thessalia	N Sporadhes	Makedhonia	Thracian Is.	Kikladhes	Kriti
Dolichopoda (Dolichopoda) pavesii				X						
Dolichopoda (D.) dalensi	X									
Dolichopoda (D.) patrizii				X						
Dolichopoda (D.) graeca			X							
Dolichopoda (D.) hussoni							X			
Dolichopoda (D.) annae					X					
Dolichopoda (D.) thasosensis								X		
Dolichopoda (D.) steriotisi				X						
Dolichopoda (D.) naxia									X	
Dolichopoda (D.) paraskevi										X
Dolichopoda (D.) matsakisi	X									
Dolichopoda (D.) unicolor	X									
Dolichopoda (Petrochilosina) petrochilosi		X								
Dolichopoda (P.) insignis		X								
Dolichopoda (P.) vandeli		X								
Dolichopoda (P.) cassagnaui		X								
Dolichopoda (P.) makrikapa		X								
Dolichopoda (P) ochtonai		X								
Dolichopoda (P) saraolacosi						X				
Dolichopoda (Chopardina) remyi							X			

Description. Male (holotype). Relatively large; body colour pale-testaceous, the colouring being uniform with the exception of the posterior margins of the tergites, which are darker. The rostral tubercles of the vertex



FIGURES 1–9. *Dolichopoda kiriakii* male: 1—X tergite, dorsal view, 2—posterior view; 3—Genital plate, dorsal view, 4—lateral view; 5—Epiphallus, dorsal view, 6—lateral view; female: 7—Genital plate, dorsal view, 8—lateral view, 9—Ovipositor, lateral view. Scale bar: 1 mm.

are subconical, dark in colour and protruding. The 6th abdominal tergite carinate along the median line; the 7th and 8th less carinate; on the posterior edge of the 9th tergite there is an evident triangular protrusion which is covered by hair and which protrudes over the central part of the 10th tergite. Legs long and yellow-testaceous in colour and the femora are unarmed. Fore tibia with two condicular spines and armed with 5/5 spines on both sides of the inferior edge and a pair of spurs of equal length on the apex. Mid tibia with 3 short spines on both sides of the upper edge, 5/6 spines on the lower edge and two apical spurs similar to those of the fore tibia. The mid tibia is longer with 17/18 spines of varying length on both sides of the upper edge and 4/1 homogeneous spines on the lower edge. Tenth tergite (Figs 1, 2), on the posterior edge, with two large lateral lobes which are separated by a large cavity. The tubercles clearly protrude and are cylindrical with a rounded apex near the posterior edge. The paraprocta are trapezoidal with particularly sclerotized and pubescent edges. Subgenital plate large and spherical at the base with curved lateral edges, with a deeply incised middle which runs for half the total length (Figs 3, 4). The symmetrical lateral lobes are triangular in shape, with curved superior and middle edges. The apices, at the edges, have a deep V-shaped incision. The epiphallus is sclerotized and from the rear the median process appears long and acute at the apex, large at the base and has no lateral constrictions (Fig. 5). The posterior process expands at the base of the epiphallus and diverges little towards the exterior, while the anterior parts are rather reduced. From the side, the median process can be to curve considerably in front of the two distal thirds (Fig. 6). The accessory apparatus is sclerotized and composed of an uneven subtrapezoidal and hairy piece and by even partially triangular valves.

Length (mm): body 19,0; pronotum 3,5; fore femur 16,0; middle femur 16,0; hind femur 25,0; fore tibia 18,0; middle tibia 19,0; hind tibia 34,0; hind tarsus 13,0; 1st article of hind tarsus 6,0.

TABLE 2. Measurements (mm) of 12 morphological parameters of the 7 species here studied.

Species	*D. kiriakii*		*D. gasparoi*		*D. ithakii*	*D. giachinoi*		*D. lustriae*		*D. pavesii*		*D. dalensi*	
	♂ (n=3)	♀(n=3)	♂ (n=2)	♀(n=3)	♂ (n=2)	♂ (n=2)	♀(n=1)	♂ (n=1)	♀(n=1)	♂ (n=6)	♀(n=2)	♂ (n=2)	♀(n=2)
Body	18–19,5	22–24	18,5–19,5	20–23	15–16	18–20	20	22	20	20–23,5	17,5–19	21–22,5	19
Pronotum	3,5	4–4,5	4–4,5	4	3–4	4	4	4,5	4	4–4,5	3,5–4	4	4,5
Fore femora.	16	16,5–17,5	17	16–17	16	15–16	15,5	17	14	15–17	15	14,5–18	16
Mid femora.	16–17	16–17	16,5–17	16	16,5–18	15–16	15	17,5	15	14,5–19	15–15,5	14–18,5	15,5
Hind femora.	25	26–28	26–27	27	26	23–23,5	25	27	26	24,5–28	24–26	24,5–29	27
Fore tibia	18	17,5–18,5	20	18	19	17–18	16,5	18	16	17–20	17–17,5	17–20	17,5
Mid tibia	18–19	17,5–19	20–21	18	18,5–19	18	17	18,5	17	17–19	17	17,5–20	17
Hind tibia	32,5–34	28–35	34	34	31,5–32	25–30	31	31	30	31–38	32–34,5	34–36	32
Hind tarsus	12,5–13	13	12–12,5	12–13	12–12,5	11–11,5	12	12	11	11–13	12–13	13	10
1°art. hind tarsus	6	7	6	6	6	5–6	5,5	6,5	5	6	6–7,5	5,5	
Ovipositor		13–15		12–14			15		19		12- 13		19
Denticles		18		16			20		20		19		16

Female. The length of the body ranges between 22 and 24 mm (ovipositor excluded) and the general form of the female is similar to the male. The subgenital plate is triangular, thickened on the sides, with a rounded apex which has a more sclerotized protuberance which is incised in the centre. The thick lateral edges protrude into the basal zone (Figs 7, 8). The 7th abdominal sternite is particularly developed, triangular in shape, with a rounded apex which occupies the entire length of the sternite. From the side, this sternite is more prominent than the previous uniform and reduced sternites. The ovipositor has an average length of 14 mm, is enlarged at the base and is regularly curved on the superior edge. The superior valves have a pointed apex and curves upwards, whereas the inferior valves are a little shorter than the superior ones, are rounded at the apex and have 18 denticles (Fig. 9).

***Dolichopoda (Dolichopoda) gasparoi* Rampini, Di Russo sp. nov.**
(Figs 10–18)

Diagnosis. In general, the size and colour are similar to the preceding example. In particular, it is different from *D. kiriakii* in form of the tenth tergite of the male which has a triangular shaped crest and trapezoidal lateral lobes on the posterior edge. The new species has a slender epiphallus and subgenital plate. Furthermore, the vertex is not prominent, the rostral tubercles are not very evident and the meta tibia has more spines.

Typical locality. The Kirospilia cave is situated south of Evghiros, on the eastern side of a large Karstic depression. The entrance is 150 metres a.s.l. from which two tunnels lead off. The larger tunnel is particularly concretionary and has a rich troglophile fauna.

Etymology. The new species is dedicated to our friend and colleague, Fulvio Gasparo, for his constant and productive biospeleological research in the west Egeide.

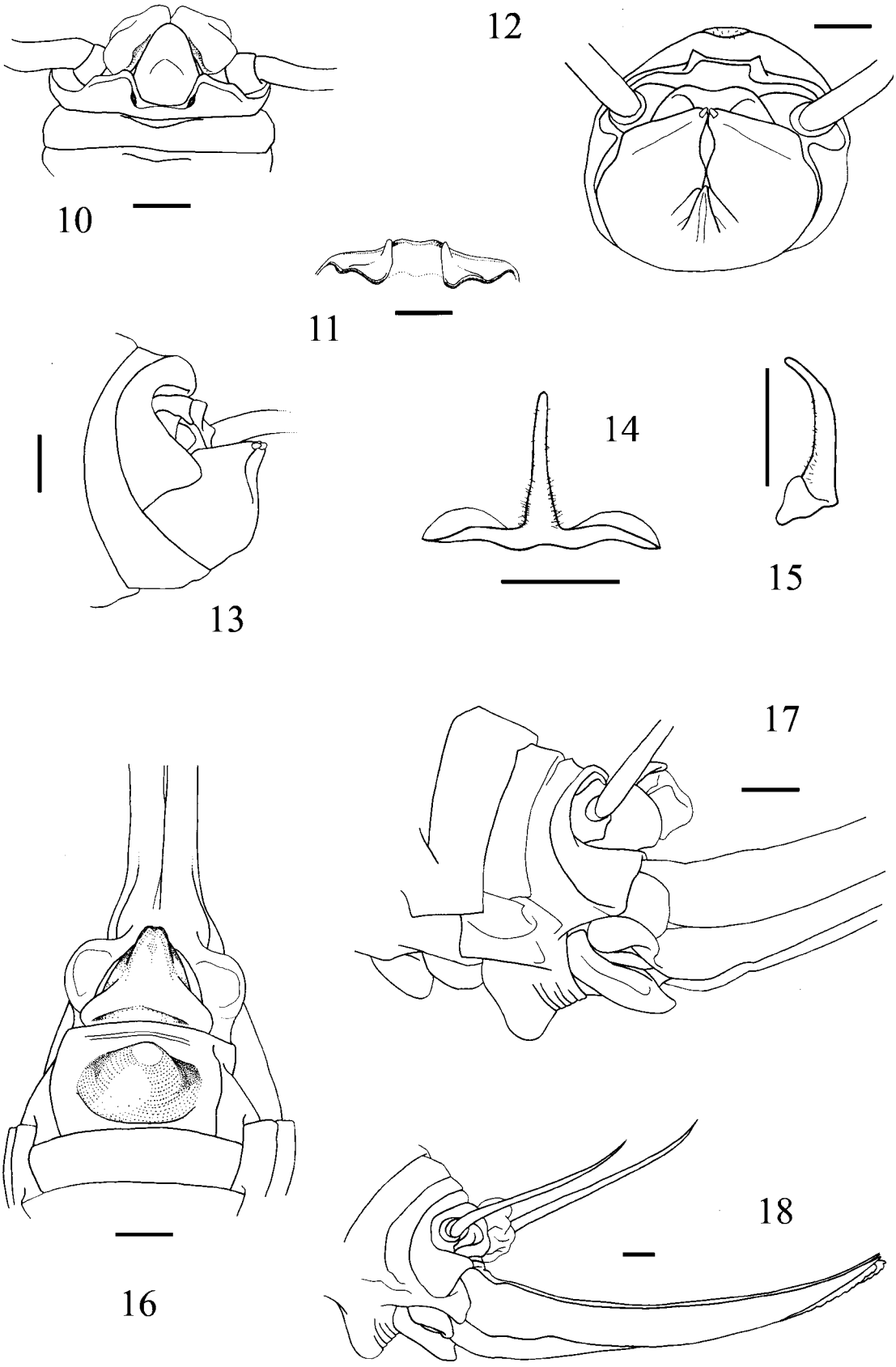
Material examined. Holotype male: Lefkada Isl., Evghiros, Kirospilia, 150 m a.s.l., lat 38° 36' 95'' N, long 20° 39' 20'' E, 03.IX.2004, F. Gasparo leg. Paratypes: same locality, data and collector as for holotype male, 4 female nymphs; same locality, 28.V.06, P. M. Giachino leg. 1 male, 3 females (MZUR, PCR).

Description. Male (holotype). Larger and more intensively coloured than *D. kiriakii*. The head has tubercles rostral to the vertex which are moderately reduced. The thorax and abdomen are similar to those of *D. kiriakii*. The 8th and 9th abdominal tergites have a posterior edge which is carinate on the median line. In the 9th, it is more developed and protrudes above the tenth tergite.

The legs are similar to those of *D. kiriakii*. Fore tibia armed on the superior edge with 1/4 spines and 4/5 spines on the inferior edge. Mid tibia identical to the previous species, while the meta tibia is longer with 22/27 varying spines on both borders of the superior edge and 3 spines on the external border of the inferior edge. Tenth tergite has a posterior edge characterized by two large lateral and diverging protuberances which protrude more in the centre; the two lobes separated by a large cavity delimited on the posterior side by a narrow band which unites the lateral tubercles. The tubercles protrude very little in the form of a crest and are situated near the posterior edge (Figs 10, 11). The subgenital plate large, particularly convex and is divided at the apex. In profile, the lateral lobes appear partially triangular, and narrowing at the apex. The superior edges are particularly curved and to the end they have a cavity which contains short apical styli (Figs 12, 13). The epiphallus is sclerotized, and from behind the uneven process appears lengthened and narrowed towards the base, and very arched and acute at the apex (Fig. 14). The basal process is wide, with short anterior and long posterior lobes which are winged and diverging. The profile of the median process shows a clear thickening in the proximal half, while the distal part, it is considerably curved forwards (Fig. 15). The accessory apparatus: uneven dorsal sclerite is moderately sclerotized and triangular in shape and rounded at the apex. The even valves are trapezoidal.

Length (mm): body 19,5; pronotum 4,5; fore femora 17,0; middle femora 16,5; hind femora 26,0; fore tibia 20,0; mid tibia 21,0; hind tibia 34,0; hind tarsus 12,5; 1st article of hind tarsus 6,0.

Female. The length of the body ranges between 20 and 23 mm (excluding the ovipositor). The general appearance of the female is similar to the male, this includes the leg spination. Subgenital plate large, triangular with a rounded apex; sides have two diverging protrusions which diverge towards the base (Figs 16, 17). The 7th abdominal sternite is characterized by a cone-like protuberance with a rounded apex. In lateral profile, it is very prominent compared to the preceding sternites. The ovipositor has an average length of 13 mm, is uniformly curved along its entire length and is more rounded at the apex. The inferior valves have 16 apical denticles (Fig. 18).



FIGURES 10–18. *Dolichopoda gasparoi* male: 10– X tergite, dorsal view, 11– posterior view; 12– Genital plate, dorsal view, 13– lateral view; 14– Epiphallus, dorsal view, 15– lateral view; female: 16– Genital plate, dorsal view, 17– lateral view, 18– Ovipositor, lateral view. Scale bar: 1 mm.

***Dolichopoda (Dolichopoda) ithakii* Rampini, Di Russo sp. nov.**
(Figs 19–24)

Diagnosis. In general, it is very similar to *D. gasparoi* of Lefkada. However, the new species is smaller in size, the lateral expansions of the tenth tergite are less developed and have a different shape. Furthermore, the lateral lobes of the subgenital plate have no apical styli and there are less spines on the meta tibia.

Typical locality. The Marmarospilia (cave of the Nymphs) is near Vathy, the principal town of the island at an altitude of 180 metres a.s.l. The cave, which is of considerable archaeological and faunal interest, following a short and narrow entrance, opens into a big oval chamber which continues into a narrow rising tunnel. The fauna associated with the *Dolichopoda* is predominantly composed of isopoda, spiders and dipterans.

Etymology. The species is named after the Island of Ithaki.

Material examined: Holotype male: Ithaki Isl., Prefecture of Kefalonia, near Vathy, Marmarospilia 180 m a.s.l., lat 38° 21' 86'' N, long 20° 41' 97'' E, 16.VI.2004, F. Gasparo leg. Paratypes: same locality, data and collector as for holotype 1 male, 2 female nymphs (MZUR, PCR).

Description. Male (holotype). The species is relatively small in size and has a similar colouring to the preceding species. The head is paler in colour, the top being slightly convex. The rostral tubercles of the vertex are considerably reduced. The thorax is similar to the preceding species. The legs are long and light yellow. The femora are unarmed, while the fore tibia is armed on the upper edge by 1/2 spines and 4/4 spines on both sides of the ventral edge. Mid tibia with 3/5 short spines on both sides of the upper edge and 5/5 spines on the ventral edge. The hind tibia has 20/23 spines of differing size on both sides of the upper edge and 1/4 spines on the inferior edge. Tenth tergite similar to *D. gasparoi*. However, the post-lateral tubercles of the upper edge are cone-like in form and bigger (Figs 19, 20). Subgenital plate spherical with a deep incision which narrows at the apex, in lateral aspect, the lateral lobes appear pubescent and are triangular with curved edges; there are no apical styli (Figs 21, 22). Epiphallus slender, particularly sclerotized, curved and has a pointed apex. The basal processes are little developed, while the posterior processes are non-diverging (Figs 23, 24). The accessory apparatus has a dorsal part which is little sclerotized, is triangular in shape and is rounded at the apex. The even valves are quite triangular in shape.

Length (mm): body 16,0; pronotum 4,0; fore femora 16,0; mid femora 16,5; hind femora 26,0; fore tibia 19,0, mid tibia 18,5; hind tibia 31,5; hind tarsus 12,5; 1st article of hind tarsus 6,0.

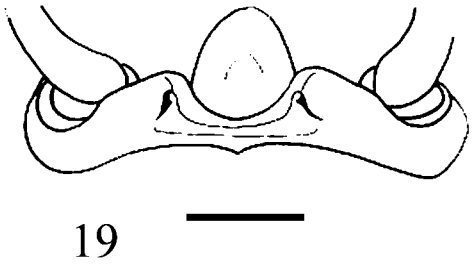
Female unknown.

***Dolichopoda (Dolichopoda) giachinoi* Rampini, Di Russo sp. nov.**
(Figs 25–33)

Diagnosis. Relatively large, slender, with very long legs and antennae. This species is different from the other Ionian species due to its pale yellowish in colour. The tenth tergite is bilobate with the upper edge which is thickened in the centre. It has prominent lateral crests. The epiphallus is long and slender. These characteristics place this new species nearest to the Dolichopoda geographically close to the Ionian islands: *D. gasparoi* (Lefkada), *D. ithakii* (Ithaki) e *D. patrizii* (Petalas).

Type locality. The Megalo Spilio cave is an old dried river which is very large. Its entrance is very narrow at 1000 metres a.s.l. at the beginning of a canal on the east side of Serekas Mount (Monastiraki). The entrance opens into a great chamber, which is full of speleotemi and clastic phenomena. The associated fauna is predominantly composed of: isopods, diplopods, pseudoscorpions, spiders, carabid and curculionid coleopterans.

Etymology. We are more than happy to dedicate this new species to our friend and colleague, Pier Mauro Giachino, who reported and collected various examples of *Dolichopoda* during his periodical biospeleological expeditions in Greece.



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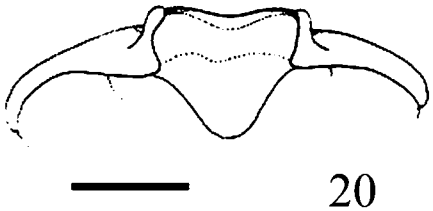

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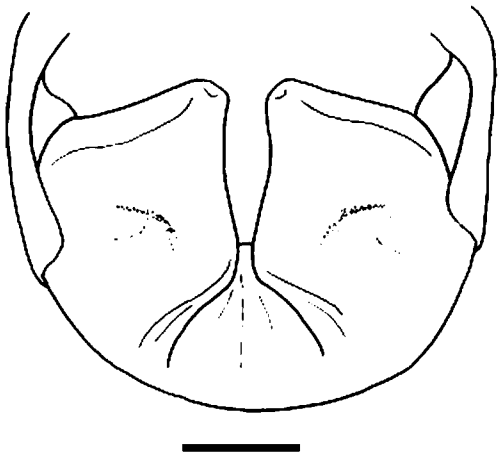

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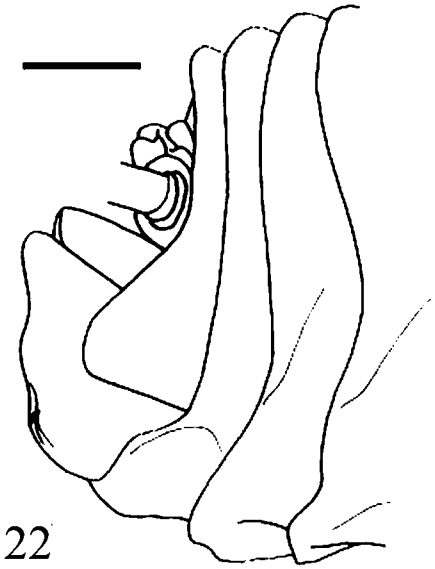

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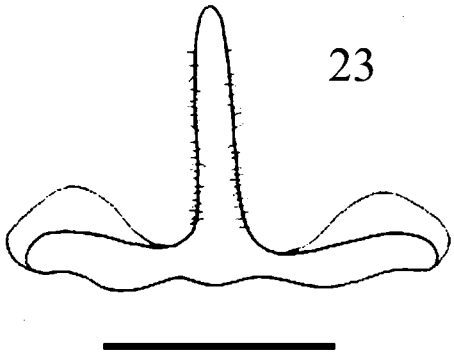

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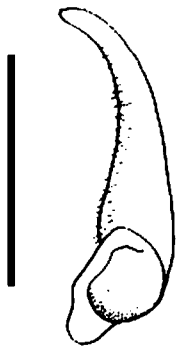

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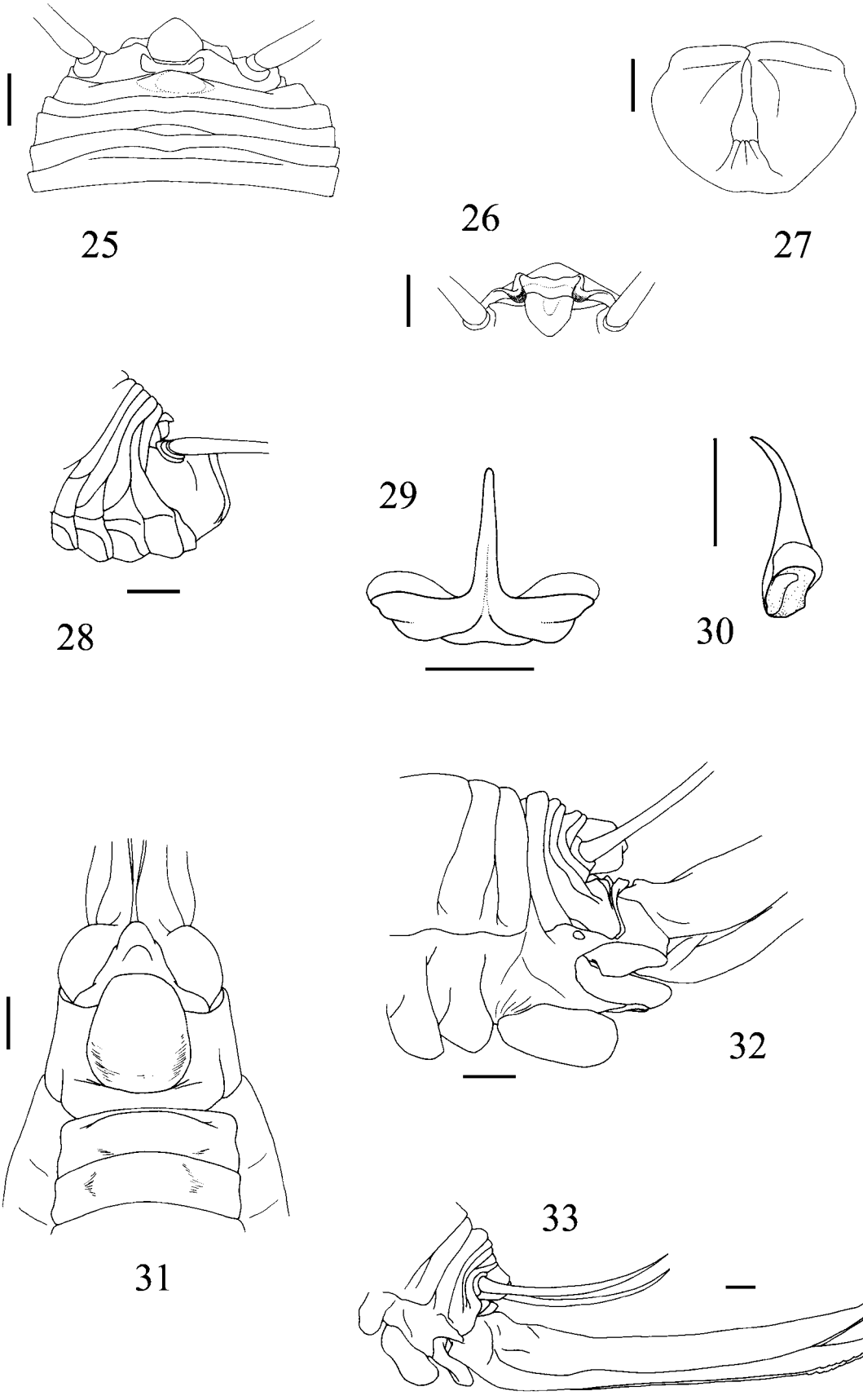
FIGURES 19–24. *Dolichopoda ithakii* male: 19– X tergite, dorsal view, 20– posterior view; 21– Genital plate, dorsal view, 22– lateral view; 23– Epiphallus, dorsal view, 24– lateral view. Scale bar: 1 mm.

Material examined. Holotypus male: Aetolia-Akarnania, O. Serekas (Monastiraki), Megalo Spilio, 1000 m a.s.l., lat 38°46’ 06’’ N, long 20°57’ 22’’ E, 02.II.07 M. Rampini, L. Lustri, G. Pintus leg. Paratypes: same locality data and collectors as for holotype 1 male, 1 female, 1 male nymph (MZUR, PCR); same locality of



FIGURES 25–33. *Dolichopoda giachinoi* male: 25– X tergite, dorsal view, 26– posterior view; 27– Genital plate, dorsal view, 28– lateral view; 29– Epiphallus, dorsal view, 30– lateral view; female: 31– Genital plate e VII sternite, dorsal view, 32– lateral view, 33– Ovipositor, lateral view. Scale bar: 1 mm.

holotype, 29.V.06, Giachino leg. 4 males nymphs and 2 female nymphs (PCR); 03.VI.07, Giachino & Vailati leg. 1 male nymph and 3 female nymphs (PCR).

Description. Male (holotype). Relatively large, with a uniformly yellow colouring and little pigmentation. Head with rostral tubercles of the vertex which are reduced and rounded, femora slender. Fore tibia with 0/2 spines on the superior edge and 5/5 spines on the ventral edge. Mid tibia with 4/5 short spines on the upper edge and 5/5 spines on the inferior edge. The hind tibia has 21/23 spines on the superior edge and 1/4 spines on the lower. From the 3rd to the 8th abdominal sternite, there are subconical protruberances which are covered in hair and rounded at the apex. From the 5th to the 8th abdominal tergite, the posterior edge is carinate in the central section, while on the 9th it is very evident. The tenth tergite has two lateral lobes, which is separated by a cavity which is narrower than the length of each of the lobes. The lateral tubercles are particularly evident. They are cone-like in shape with an apex which bends forwards, and are connected by a thick crest on the upper margin (Figs 25, 26). The subgenital plate is as in Fig. 27 and Fig. 28. There are no styli. The epiphallus is scherotized, and has a slender and long median process with an acute apex which curves cephalad. From the rear (Fig. 29), the basal processes appear partially schlerotized, wide and diverging. In lateral aspect (Fig. 30), the median process is more thickened proximal one-third, and is more slender and curved in the distal one-third. The accessory apparatus: uneven dorsal piece is sclerotized, partially triangular, rounded at the apex and covered by hair; valves relatively triangular in shape.

Length (mm): body 18,0; pronotum 4,0; fore femora 15,0; mid femora 15,0; hind femora 23,5; for tibia 18,0; mid tibia 18,0; hind tibia 25,0; hind tarsus 11,5; 1st article of hind tarsus 6,0.

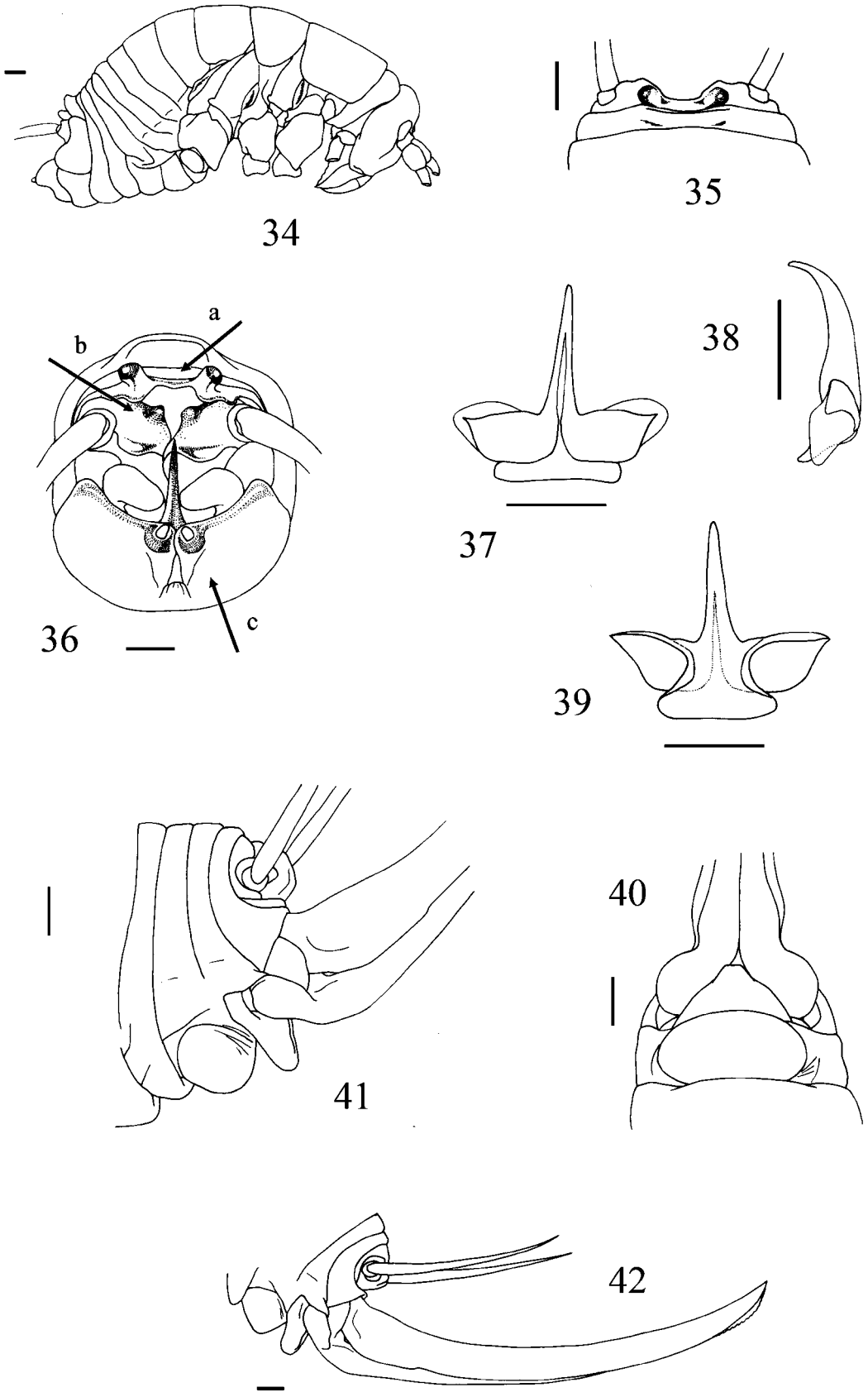
Female. Length of the body is 20 mm (excluding the ovipositor). The general appearance and colour of the female are similar to the male. The 7th sternite has a large partially rectangular protrusion. From the side, it is very prominent compared to the preceding sternites, which are all very similar in size and shape. Subgenital plate in the shape of a flattened triangle with thickened lateral edges and apex (Figs 31, 32). Ovipositor 15 mm in length, not very wide at the base, almost straight, with superior valves which are narrow in the distal half. The apex is pointed and curved upwards. The inferior valves have 20 apical denticles (Fig. 33).

***Dolichopoda (Chopardina) lustriae* Rampini, Di Russo sp. nov.**
(Figs 34–42)

Diagnosis. The specimens of this species are larger than those found in the Ionic regions. The animal is yellowish-brown in colour. The edges of the pronota and the first abdominal tergite are considerably darker than the remaining tergites which are characterized by a lighter and narrower band. The head has a rounded vertex and very evident rostral tubercles. The tenth tergite has well-developed lateral expansions and tubercles similar to *D. dalensi* and *D. matsakisi* of the Peloponnesian area. The hind femora are armed with various spines on the inferior edge. Due to this characteristic, this new species must be attributed to the subgenus Chopardina present in Greece with the *D. remyi* species of Macedonia. However, there are other characteristics, such as the shape of the epiphallus and the tenth tergite which relate it to the species of the Peloponnesian area.

Type locality. The cave is situated in the territory of Halkiopuli (Etolia-Akarnania). It originates from an old river situated 1150 m a.s.l. on the steep western slopes of Pselovuni Mountain (Southern sector of the Valtou Mountains). The cave has a large semi-circular entrance which opens into a gallery (where the chapel dedicated to the hermit, S. Andrea, is situated). This gallery then forks. The left one is larger and better developed and has better climatic conditions. Probably for this reason, the examples of *Dolichopoda* were found in this gallery.

Etymology. We are happy to dedicate this new species to Lucilla Lustri for her important and assiduous speleological activity and for having participated in various missions with us (Rampini) in the caves of North-Western and Central Greece.



FIGURES 34–42. *Dolichopoda lustriae* male: 34—body, lateral view (without antennal flagellum, maxillae, labium, femora, tibiae and tarsi); 35—X tergite, dorsal view; 36—Terminal abdomen, posterior view: a—X tergite, posterior view; b– Paraprocta, c– Genital plate, dorsal view; 37—Epiphallus dorsal view; 38—lateral view; 39—ventral view; female: 40—Genital plate, dorsal view, 41—lateral view, 42—Ovipositor, lateral view. Scale bar: 1 mm.

Material examined. Holotype male: Etolia-Akarnania, Halkiopuli, Pselovuni Mountain (1472 m a.s.l.), Aghias Andreas Cave, 1150 m a.s.l., lat. 38°59'25'' N; long. 21°23'10'' E, M.Rampini, G.Pintus, L.Lustri leg. Paratypes: same locality, data and collectors as for holotype 1 female, 3 male nymphs and 4 female nymphs (MZUR, PCR).

Description. Male (holotype) (Fig. 34). The species is big and yellowish in colour with thoracic tergites and the first abdominal segment which are decorated with large dark bands. The head is paler in colour with a rounded vertex and dark and pronounced rostral tubercles. Legs elongate and testaceous in colour. Fore and mid femora slender and have no spines. Hind femur with 1 short spine on the external and internal condyle, and 11 spines on the external edge and 23 spines on the internal part of the inferior edge. The tibia have variable numbers of spines, however, this variation is limited. Fore tibia armed with 3/3 short spines on the superior edge on both sides, whereas there are 4 on the external parts and 5 on the internal parts of the inferior edge, with two apical spurs. Mid tibiae with their upper and lower edges with 6 spines on the external side and 5 on the internal. Hind tibia with only 2 external spines on the upper edge and 21 spines on both sides of the upper edge. The tenth tergite, viewed posteriorly, appears narrow and has lateral lobes of the posterior edge short and trapezoidal, diverging, and separated by a large cavity; anterior side of the lobeswith a shallow incision in the middle (Fig. 35); tubercles are enlarged, cylindrical and diverging, rounded at the apex, and connected to each other by the central part of the slightly thickened upper edge (Fig. 36a). The partially rectangular paraprocts are covered in hair at the edges, with a superior side elongated posteriorly, darker and well covered by short hair (Fig. 36b). Subgenital plate particularly convex ventrally and well divided at the apex, while the partially rectilineal incisure of the apical part diverges at the basal portion forming a bell-shape; lateral lobes triangular and terminate with large cylindrical styli which are inserted in a deep apical incisure (Fig. 36c). Epiphallus sclerotized, the median process is elongated and very arched forwards with an acute apex, which widens at the base; basal lobes more evident and perpendicular to the median process, while the posterior ones are more developed and wing-like in shape (Fig. 37, Fig. 38 and Fig. 39). Median process, viewed laterally, appears thickened for 2/3 of its length and considerably more slender and curved in the apical part. The accessory apparatus has a uneven part which is little sclerotized and is partially trapezoidal. The valves are very chitinous, triangular and pointed at the apex.

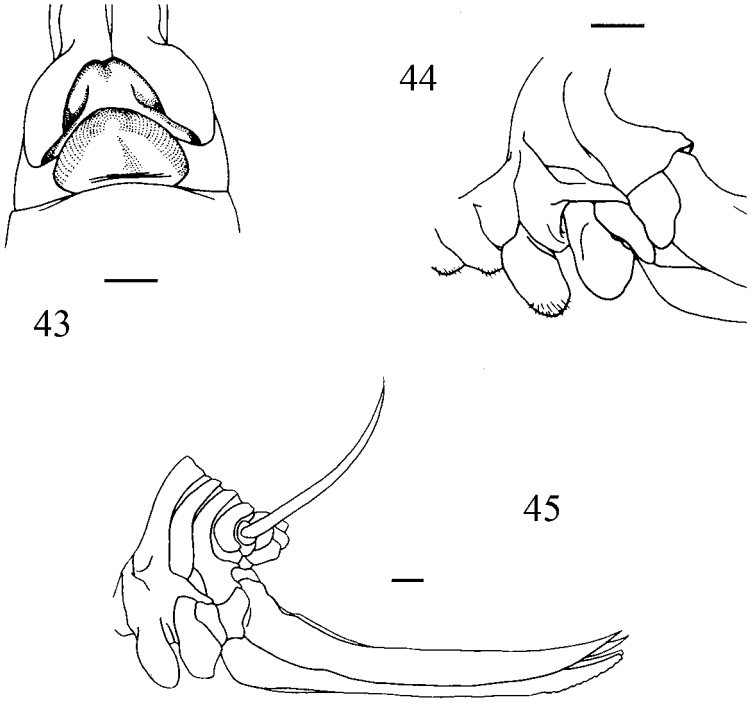
Length (mm): body 22,0; pronotum 4,5; fore femora 17,0; mid femora 17,5; hind femora 27,0; fore tibia 18,0; mid tibia 18,5; hind tibia 31,0 hind tarsus 12,0, 1st article of hind tarsus 6,5.

Female. The length of the body 20 mm. The general appearance and the number of spines on the legs are very similar to the male. Subgenital plate triangular in shape, with a rounded apex with a large cylindrical protuberance which is more sclerotized and with a deep incision in the centre (Fig. 40). The 7th urosternite has an evident spherical protuberance which is as large as the sternite (Fig. 41). Ovipositor almost as long as the body (19 mm). In this respect, it is similar to that of *D. dalensi* of the Peloponnisos, and is uniformly curved upwards and is slender at the apex. The inferior valves have 20 denticles (Fig. 42).

Dolichopoda (Dolichopoda) pavesii Galvagni, 2002
(Figs 43–45)

Thanks to the collection of new examples, it was possible to describe the morphology of the female of *D. pavesii* so completing the studies of Galvagni (2002) where he describes a small immature female. The new examples come from the Drogarati cave which is not far from the type locality (Drakotripa cave near the village of Aghia Nikolaos), approximately 15 Km from Sami.

Material examined. Ionian Isl., Kephallinia (Kefalonia), near Sami, Drogarati cave, lat 38° 14' 62'' N, long 20° 38' 73'' E, 13.VIII.2003, C. Di Russo leg. 6 males, 2 females, 1 male nymph and 2 female nymphs (MZUR, PCR); same locality, 15.VI.2004, F. Gasparo leg. 6 male nymphs and 4 female nymphs (PCR).



FIGURES 43–45. *Dolichopoda pavesii* female: 43– Genital plate, dorsal view, 44– lateral view, 45– Ovipositor, lateral view. Scale bar: 1 mm.

Female description. The spines on the legs are similar to those on the male. Tenth tergite similar to the male, but lacking tubercles. Lamina reticularis triangular. Subgenital plate triangular, thickened, and has a rounded apex with a large wing-like protuberance which is more sclerotized and with a deep incision in the centre (Fig. 43). The 7th urosternite has a prominent coniform protuberance which is rounded at the apex; it is flattened and narrowed at the base and is not as wide as the sternite. In lateral aspect, it is very prominent compared to the preceding sternites. (Fig. 44). Ovipositor large basally, similar to *D. kiriakii* of Parga, and more curved in the first proximal portion. The superior valves have an acute apex which curves upwards. The inferior valves have a rounded apex and 19 denticles (Fig. 45).

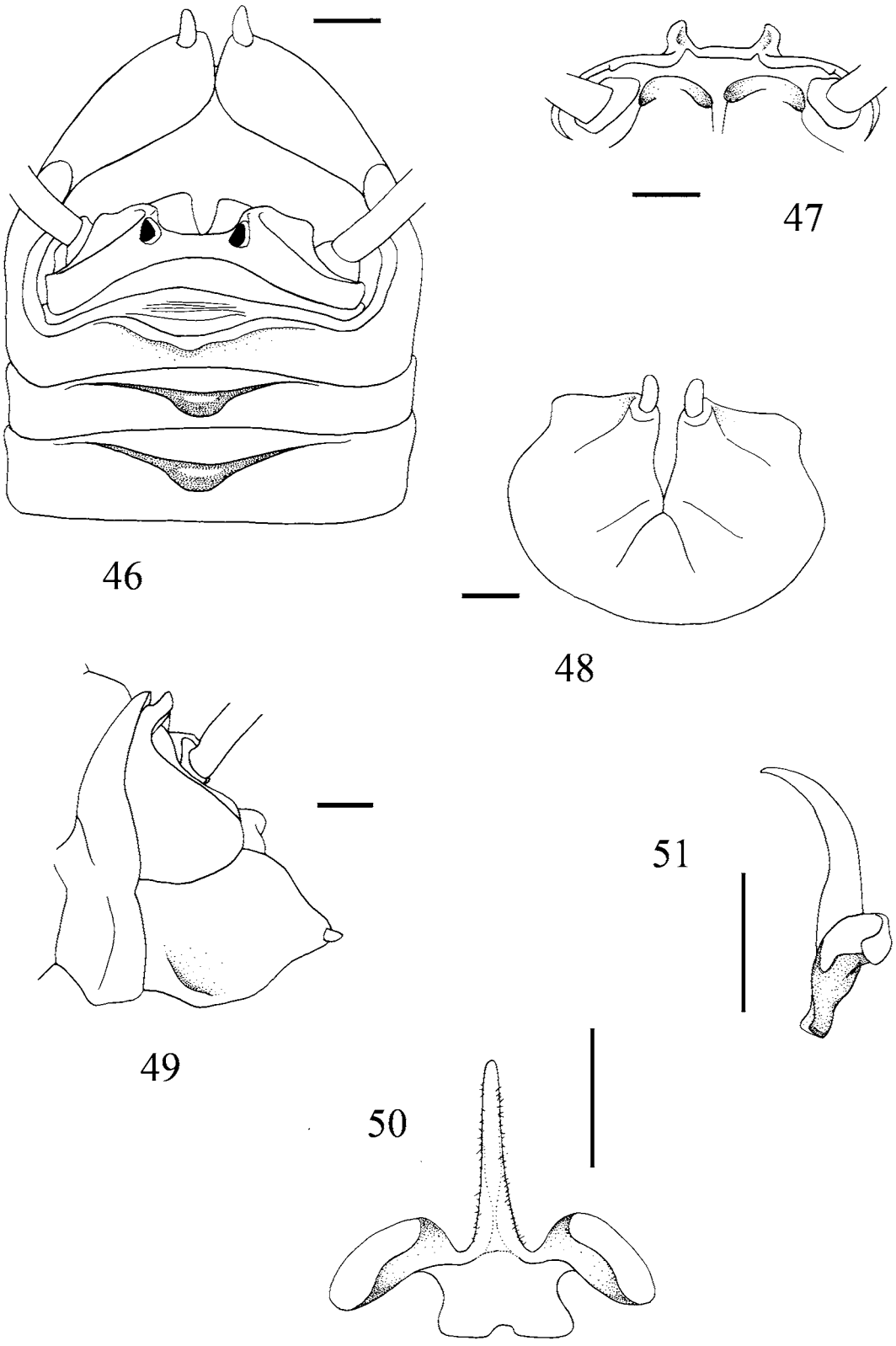
Length (mm): body 17,5; pronotum 3,5; fore femora 15,0; mid femora 15,5; hind femora 26,0; fore tibia 17,5; mid tibia 17,0; hind tibia 34,5; hind tarsus 12,0; 1st article of hind tarsus 6,0; ovipositor 12,0.

Dolichopoda (Dolichopoda) dalensi Boudou Saltet, 1972
(Figs 46–51)

Also in this case, in order to complete the work of Boudou-Saltet (1972) where only one female of the new species was reported, we describe the *D. dalensi* male specimen on the basis of new examples we recently collected in the typical locality.

Material examined. Peloponnisos, Argolis, Kefalari, Kephalovrissi cave, 18.VIII.05, M. Rampini, C. Di Russo leg. 2 males, 2 male nymphs and 2 female nymphs (MZUR, PCR).

Male description. The species is large and is yellowish-brown in colour with darker posterior edges of the nota and the tergites. The ventral side uniformly lighter in colour. The head has rostral tubercles of the vertex which are dark and protruding, with clear eyespots on the sides, with deep longitudinal incisions. The legs are particularly elongated and testaceous in colour. The femora are slender. Fore tibia with 3/3 spines on both



FIGURES 46–51. *Dolichopoda dalensi* male: 46– X tergite, dorsal view, 47– posterior view; 48– Genital plate, dorsal view, 49– lateral view; 50– Epiphallus, dorsal view, 51– lateral view. Scale bar: 1 mm.

sides of the superior edge and 4/5 spines on both sides of the inferior edge. Mid tibia with 5/7 spines on the superior edge and 3/4 spines on the inferior. The hind tibia with 16/18 spines on the superior edge and 2 on the

external sides of the inferior margin. In the 7th, 8th and particularly the 9th abdominal tergites, the posterior edge is convex in the centre and bends backwards. The tenth tergite has two large partially-square lateral lobes with a sinuous anterior edge, which is separated by a large central depression; at the posterior corners of the incision, there are two protruding tubercles, pyramidal in shape, and which have an apex curving inwards (Figs 46, 47). The square-shaped paraprocts have two rounded protuberances on the sides of the superior edge which are very sclerotized. Subgenital plate spherical at the base with an incision on the posterior side which runs for half the length of the plate; the rising triangular lateral lobes have superior and ventral edges which are not particularly arched. The styli are well-developed and pubescent, and are twice as long as they are wide (Figs 48, 49). The epiphallus is sclerotized. In posterior view, the median process is seen to curve forwards, and is acute at the apex and very elongated, well-sclerotized and light brown in colour; the inferior edge is concave and the basal processes are lighter and perpendicular to the median process. The posterior processes more developed than the anterior processes, larger, wing-like in shape and diverge in a posterior direction (Fig. 50). Laterally, the median process of the epiphallus appears thickened in the third proximal and considerably more slender and curved forwards in front of the third distal (Fig. 51).

Length (mm): body 22,5; pronotum 4,5; fore femora 14,5; mid femora 14,0; hind femora 24,5; fore tibia 17,0; mid tibia 18,0; hind tibia 34,0; hind tarsus 13,0; 1st article of hind tarsus 7,0.

Discussion

Five new species of the *Dolichopoda* genus have been described for the western area of Central Greece. Considering the other 6 species already documented in the area (including the North of the Peloponnisos), there is now a total of 11 recorded species of *Dolichopoda* which currently inhabit the underground areas of this zone (Fig. 52). These new data, therefore, document the diversity of the genus in the Hellenic region (25 species in all) reinforcing the hypothesis that there was a central area of dispersion of the *Dolichopoda* in the ancient Aegean plate (Ruffo 1955).

Through the description of the male of *D. dalensi*, it is possible to confirm the taxonomic position of this taxon and its affinity with the other species of the Peloponnisos, *D. matsakisi*. Four of the new species described (*D. kiriakii, D. gasparoi, D. giachinoi and D. ithakii*) can be attributed to the subgenus *Dolichopoda* s. str. because they have no spines on the metafemora. *D. lustriae* of the Aghias Andreas cave, of the Etolia (Valtou Mountains), on the other hand, due to the high number of spines on the posterior femur, should be considered a part of the subgenus *Chopardina* Baccetti, 1958, which is present in Greece with the species, *D. remyi* in Central Macedonia (small caves below the Edessa waterfall). However, for a series of characters such as the shape of the tubercles of the tenth tergite of the male and the epiphallus and for the 7th urosternite of the female and the shape of the ovipositor, *D. lustriae* shows affinities with the species of the Peloponnisos, in particular with *D. dalensi* of the Kephalovrissi cave (Argolis). As reported in previous studies regarding Italian and Corsican species of *Chopardina*, it will be necessary to accumulate more data to test the taxonomic validity of this subgenus given that it can currently only be identified due to the number of spines on the posterior femur.

All the species in the present study have characteristic tubercles of varying sizes on the tenth male tergite. Protuberances of this type can, however, also be found in other Greek species such as *D. annae* of the Thessalia and *D. hussoni* in Macedonia. However, in these species, the expansions appear more to be curved covers of the tenth rather than distinct protuberances. A more detailed analysis of the shape of the epiphallus made it possible to distinguish between two groups of species from Ionian Greece. A first group including *D. kiriakii, D. steriotisi, D. graeca* and *D. pavesii* is characterized by an epiphallus which has a wide base and distinct cylindrical tubercles on the male X tergite. A second group comprising *D. gasparoi, D. ithakii, D. giachinoi* and *D. patrizii*, has a narrow and slender epiphallus and laminated projections of the X tergite. These two

groups are also geographically distinguishable because the first grouping is limited to the northern area of the Ionian, while the second is typical of the more southern areas of the Ionian. Only the species *D. pavesii* from Kefalonia does not match with this pattern being a southern species with similar morphological characteristics to the northern species.

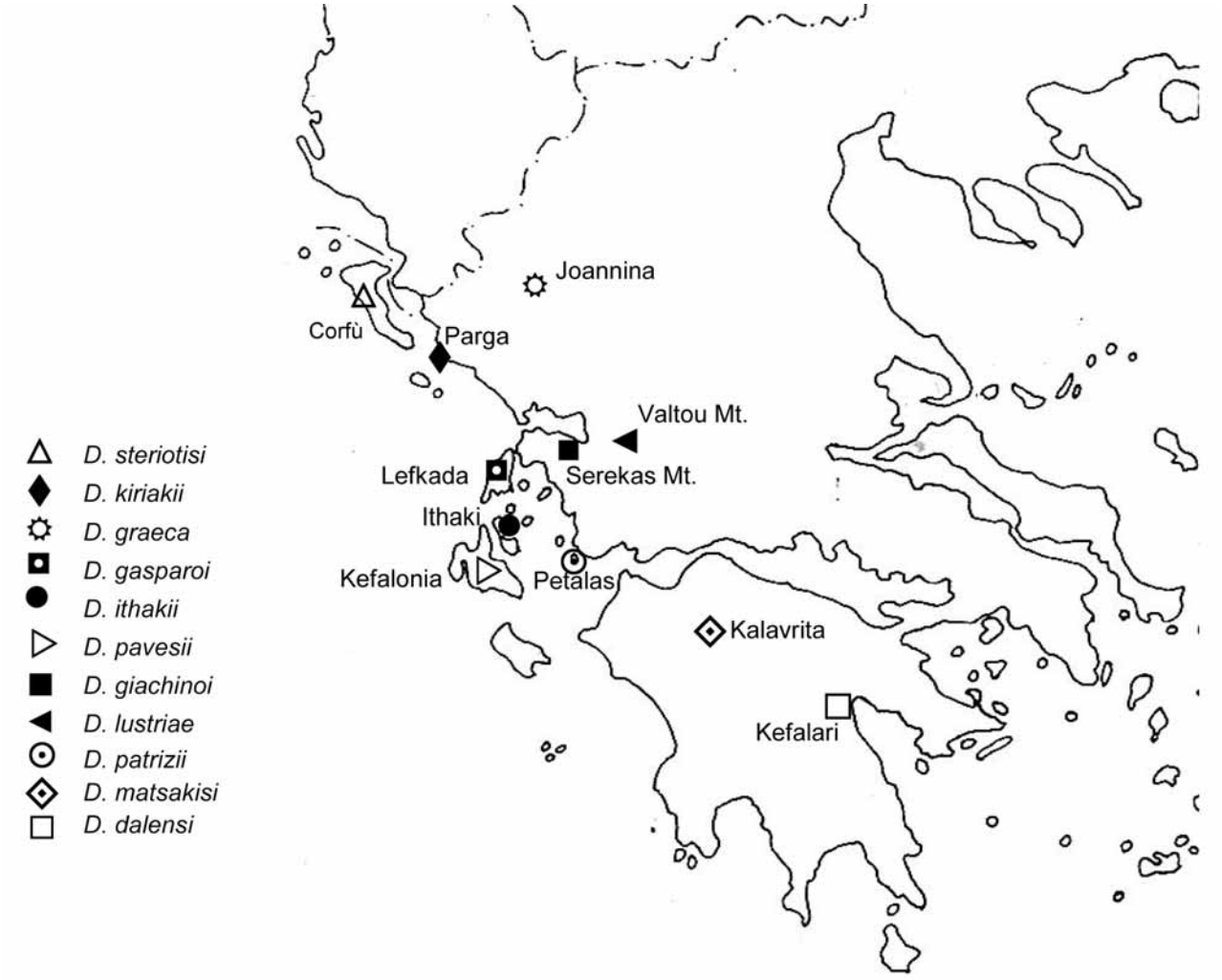


FIGURE 52. Distribution of species of *Dolichopoda* (s. str.) in Ionian area: light simbols show known sp.; dark symbols show sp.n.

Acknowledgements

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