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THE GENERA *ARAEONCUS* SIMON, *DELORRIPIS* SIMON AND *DIPLOCEPHALUS* BERTKAU IN NORTHERN AFRICA (ARANEAE: LINYPHIIDAE: ERIGONINAE) STUDIES ON NORTH AFRICAN LINYPHIIDAE VII.

ROBERT BOSMANS

Laboratorium voor ecologie, zoögeografie en natuurbehoud
Ledeganckstraat 35, B-9000 Gent (Belgium)

Abstract. The author revises the genera *Araeoncus*, *Delorrhipis* and *Diplocephalus* in North Africa. *Araeoncus martinae*, *A. toubkal*, *Diplocephalus algericus* and *D. sabulicolus* are newly described, and *A. humilis*, *A. hanno*, *Delorrhipis fronticornis*, *Diplocephalus graecus*, as well as the European *A. altissimus* and *A. discedens* are redescribed. *A. meridionalis* Denis, 1954 is a junior synonym of *A. humilis* (Blackwall, 1841).

Key-words: Linyphiidae, *Araeoncus*, *Delorrhipis*, *Diplocephalus*, taxonomy, North Africa.

INTRODUCTION

In a seventh contribution to the taxonomy and systematics of the Linyphiidae, Erigoninae of Northern Africa, the species of the Savignya group, as proposed by MILLIDGE (1977) are revised. These species all have a typical epigyne covered by two plates with long median fissure. The genera of this group that occur in North Africa are *Araeoncus* Simon, *Delorrhipis* Simon and *Diplocephalus* Bertkau.

Four *Araeoncus*, four *Diplocephalus* and one *Delorrhipis* species have been cited or described from Northern Africa:

- *Araeoncus hanno* Simon, 1884, described from Algeria and never recollected since; DENIS (1954) redescribed it;
- *Araeoncus altissimus* Simon, 1884, described from the French Pyrénées and cited from Morocco by FAGE (1938), DENIS (1968) and JOCQUÉ (1977);
- *Araeoncus humilis* (Blackwall, 1841), a common European species, cited from Algeria and Morocco by DENIS (1937, 1968);
- *Araeoncus meridionalis* Denis, 1954, described from a single female from Algeria;
- *Diplocephalus graecus* (O.P.- Cambridge, 1872), a common Mediterranean species, cited from Algeria by SIMON (1884, 1885), from Morocco by DENIS (1955, 1964a, 1968) and from Tunisia by SIMON (1885), DENIS (1964a) and THALER (1977);

– *Diplocephalus cristatus* (Blackwall), mentioned from «Afrique du Nord» by SIMON (1884, 1926);

– *Diplocephalus dimidiatus* Denis, 1945, cited from Morocco (DENIS 1945) and Tunisia (DENIS 1964a), later synonymised with *D. graecus* by DENIS (1964b);

– *Diplocephalus curvicervix* Denis, 1964a, described from Tunisia but transferred to *Typhochrestus* by BOSMANS & ABROUS (1990);

– *Delorrhipis fronticornis* Simon, 1884, cited from Tunisia and Algeria by SIMON (1884).

To be complete, we have to mention a *Diplocephalus* sp. A and a *Diplocephalus* sp. B, described from Tunisia by THALER (1977).

The species treated in this paper form a very homogeneous group, regarding cephalic lobes, chaetotaxy (tibial spines 2211, Tm 0.35-0.55, no Tm IV), and epigynes (typically divided into two ventral plates with median fissure).

MILLIDGE (1977) placed *Delorrhipis*, *Diplocephalus* and *Araeoncus* in the *Savignya* group. In this group, genera have been based almost entirely on the form of the male head, but regarding palpal conformation, it is difficult or impossible to perceive any natural discontinuities corresponding with current generic boundaries. It would be logical to recognize the close relationship of all these species as shown by the palpal conformation and the chaetotaxy by the combining of all these genera. *Savignya* would then have priority.

WUNDERLICH (1980, 1995) shares this opinion, but ESKOV (1988), disagrees in considering *Savignya* and *Delorrhipis* as two sister groups and two distinct genera.

A full revision of the *savignya* group obviously is needed, which is above the scope of the present paper. Until then, I prefer to retain the old generic boundaries and leave the species where they are. It has to be reminded that there are several «forgotten» generic names, currently considered synonyms of *Diplocephalus*, and these are available to classify species: *Prosoponcus* Simon, 1884, *Plaesiocraerus* Simon, 1884 and *Streptosphaenus* Simon, 1926.

DESCRIPTION OF SPECIES

Abbreviations used in the text:

Fe, Pa, Ti, Mt, Ta: femur, patella, tibia, metatarsus, tarsus.

AE, PE, AM, AL, PM, PL: anterior, posterior, anterior median, anterior lateral, posterior median, posterior lateral eyes.

SpTiI, SpTiIV: relative length of the spines on tibiae I, IV, as compared to their diameter.

Tm: Position of the metatarsal trichobothrium.

BMNH: British Museum of natural History.

IRSNB: Institut royal des Sciences naturelles de Belgique.

MNHNP: Muséum national d'Histoire naturelle de Paris.

All measurements are in mm.

Araeoncus humilis (Blackwall, 1841)

Walckenaera humilis Blackwall 1841: 636.

Araeoncus humilis; Simon 1884: 636; Denis 1937: 1042; Denis 1968: 156.

Araeoncus meridionalis Denis 1954: 313 (descr. ♀) New Synonymy.

Type material

Holotype female of *Araeoncus meridionalis* from Algeria, Touggourt; examined (MNHNP).

Other material examined and citations

ALGERIA: Saida: Djebel Daya (Denis, 1937). Batna: Ras-el-Ayoun, 700m 2 ♀♀ in litter of small *Populus alba* forest around fountain, 16.X.1987. Boumerdes: Reghaia, coastal march of Oued Reghaia, 5m, 2 ♂♂ in pitfalls, 3.V.1988. El Bayadh: E. El Abiod-sidi-Sjeikh, Noukhaila, 900m, 2♂♂6♀♀ between herbs near spring in small palm yard, 19.I.1988. El Tarf: El Kala, Lake Tonga N., 6m, 4♂♂2♀♀ in pitfalls in *Pinus halepensis* forest, 1.III.1990. El Kala, Lake Oubeira, 10m, 1♂ in pitfall in maquis bordering the lake, 23.XI.1989. Laghouat: Laghouat, 750m, 2♂♂2♀♀ in *Phragmites* litter along Oued M'zi, 22.XI.1987. M'sila: Bou Saada (Simon 1884); S. Hammam Delaa, 800m, 1♀ along permanent river, 13.V.1988. MOROCCO: Casablanca: Casablanca, 5♂♂, V.1984. Ketama: W. Bab Bered, 1525m, 1 ♀, wet grassland in *Q. faginea* forest, 15.V.1982. Rabat: Rabat (Denis, 1968). Zenata. Amzou, near Ouled Teima (Denis, 1968). TUNISIA: Tozeur: Nefta, 1♀ in palm yard, 27.I.1995.

Diagnosis

Males are easily recognized by the shape of the tibiae I-II. In the female, the two plates of the epigyne are somewhat more bulging and more rounded at their posterior margin, the median fissure is relatively shorter; the shape of the semicircular spermathecae, close and parallel to the border of the epigyneal plates, allows differentiation of females more easily.

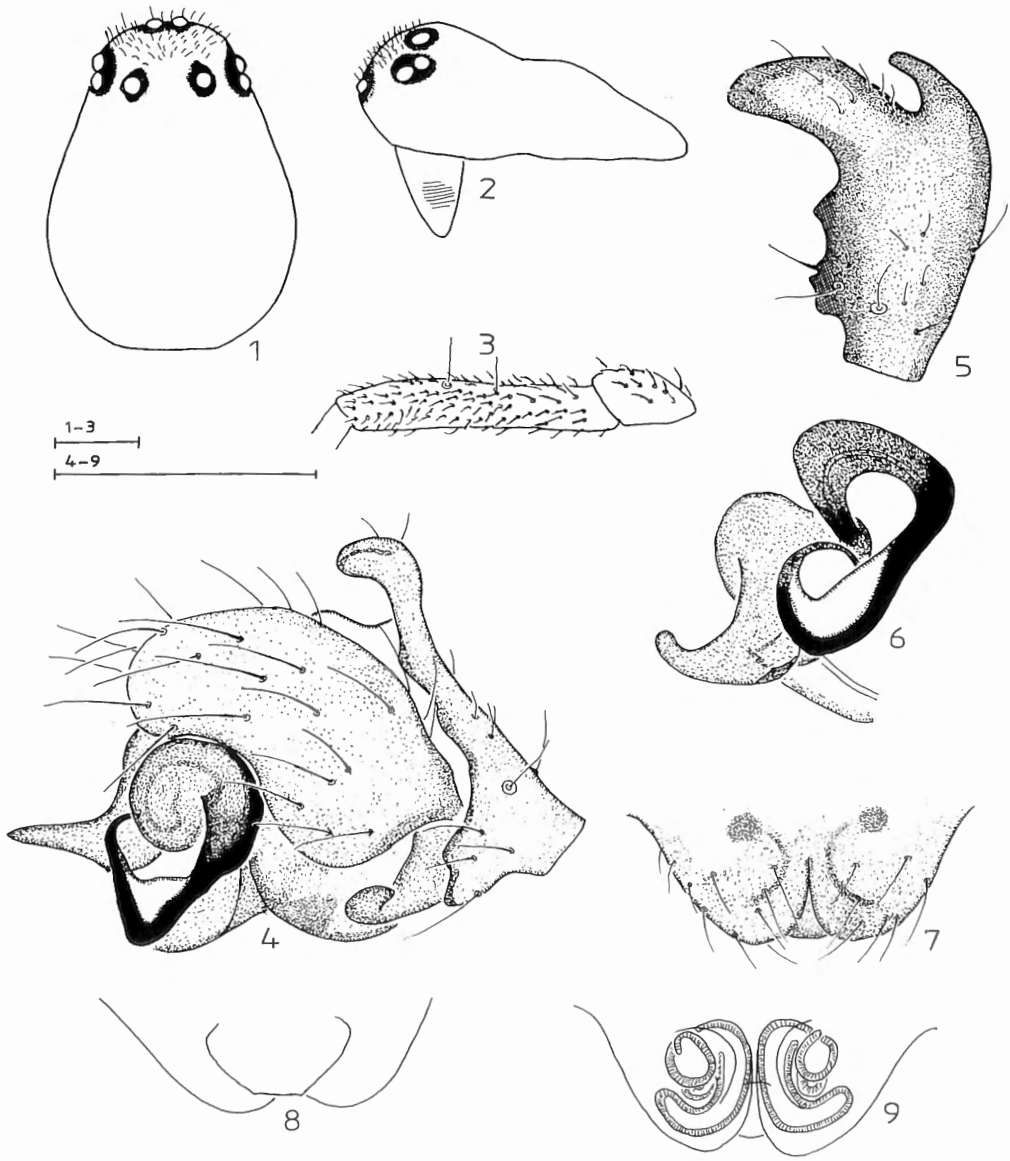
Remark

The specimens collected in oases more to the south (at Noukhaila and Laghouat for instance) are smaller and paler than the specimens collected in the north. Genital organs are however completely identical, and we consider them the same species. A female described as *A. meridionalis* by Denis (1954) from the oasis of Touggourt in Algeria is such a specimen. We consider it a synonym of *A. humilis*.

Description

Male

Measurements: total length 1.5-1.9; prosoma 0.72-0.84 long, 0.58-0.64 wide. Colour: Prosoma brown to deep brown, spot before fovea, margin and striae darkened, with a paler interocular area; legs yellowish orange, segments often darkened at apices; abdomen dark



Figs 1-9. – *Araeoncus humilis* (Blackwall). — 1. Male prosoma, dorsal view – 2. Idem, lateral view – 3. Male tibia I, lateral view – 4. Male palp, lateral view – 5. Male palpal tibia, dorsal view – 6. Embolic division, antero-lateral view – 7. Epigyne, ventral view – 8. Idem, postero-ventral view – 9. Vulva, ventral view. (scale line: 0.2 mm).

grey. Prosoma (Figs1-2): cephalic part slightly protruding, wide in dorsal view, in lateral view with distinct concavity. AM separated by 0.75 their diameter, from the AL by 2.5 times their diameter; PM separated by 2.5 times their diameter, from the PL by 1.5 times their diameter. Chelicerae: with eight indistinct stridulating ridges. Legs: tibiae curved at their base, furnished with many short hooked bristles. Spine formula of tibiae 1111, on Tibia I-II (Fig. 3) very short dorsal spines, on TiIII-IV normal. LSpTiI=0.9, LSpTiIV=1.2. TmI=0.40-0.46. Palp (Figs 4-6): tibia large, with two apophyses, a large, blunt retrolateral one, and a much smaller prolateral one, and with some large retrolateral tubercles. Protegulum protruding. Suprategular apophysis long, slightly curved, terminally pointed. Embolus describing an entire circle, angular, distal third with large membrane.

Female

Measurements: total length 1.9-2.1; prosoma 0.60-0.76 long, 0.48-0.56 wide. Colour and general appearance as in the male. Prosoma: unmodified. AM separated by their diameter, from the AL by 4/3 their diameter; PE separated by their diameter. Legs: spine formula 2211. LSpTiI=1.1, LSpTiIV=1.4. Epigyne (Figs 7-8): with relatively short median fissure, dorsal plate posteriorly protruding between the fissure as a small triangle; in dorsal view, the dorsal plate is trapezoid. Vulva (Fig. 9): spermathecae strongly elongated, describing a semicircle, following closely the border of the epigyneal plates.

Distribution

Europe and Northern Africa, mentioned here for the first time from Tunisia. It is the only *Araeoncus* which penetrates more to the inland.

***Araeoncus hanno* Simon, 1884**

Araeoncus hanno Simon 1884: 638 (descr.♂); Denis 1954: 312 (descr. ♀).

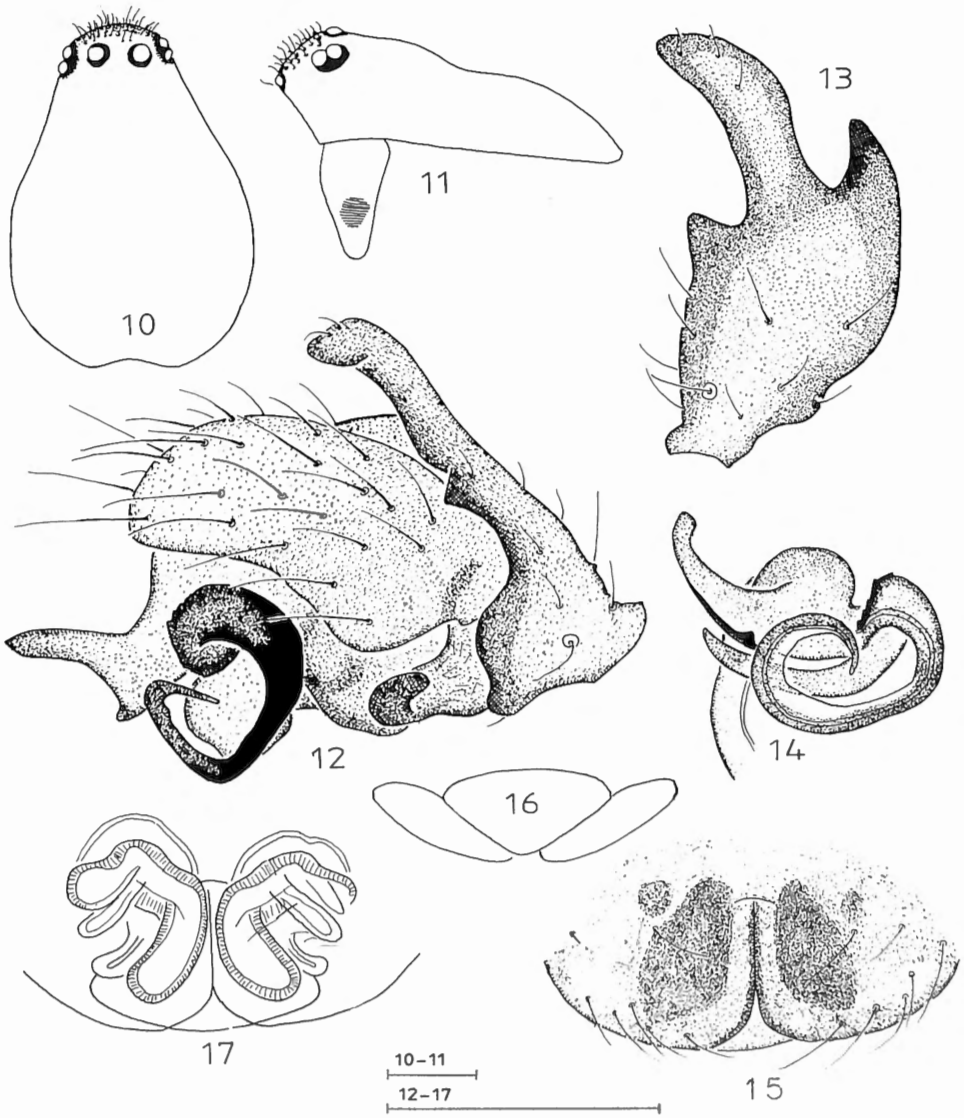
Type material

Lectotype male, paralectotype female, by present designation, from Algeria, Blida, ravin de l'Oued Kebir (MNHNP 5893); paralectotype female from Algeria, Alger (MNHNP 1058).

SIMON (1884) based his description on material from two localities in Algeria. The only male present is here selected as lectotype.

Other material examined and citations

ALGERIA: Alger: El Harrach ('Maison Carré'), 3♂♂ 1 ♀ (MNHNP 13156). Blida: Djebel Mouzaia, 1450m, 1♀ in grassland, 8.IV.1986. Tiaret: E. Frenda, 1075m, 1♀ in grass tussocks in wet grassland, 26.IV.1984. Tizi Ouzou: Massif du Djurdjura, Tala Guilef, 1450m, 6♂♂ 6 ♀ ♀ by sieving litter in *Cedrus atlanticus* forest, 29.IV.1984. Idem, 1400m, 1♂ in pitfall in grassland in *Cedrus* forest along a rivulet, 22.III.1989.



Figs 10-17. – *Araeoncus hanno* Simon. — 10. Male prosoma, dorsal view – 11. Idem, lateral view – 12. Male palp, lateral view – 13. Male palpal tibia, dorsal view – 14. Embolic division, antero-lateral view – 15. Epigyne, ventral view – 16. Idem, postero-ventral view – 17. Vulva, ventral view. (scale line: 0.2 mm).

Diagnosis

Closely related to *A. humilis*, males differing by the unmodified tibiae I, and by the absence of the large membrane on the distal part of the embolus, females by the longer median fissure of the epigyne and the U-shaped spermathecae.

Description

Male

Measurements: total length 1.4-1.5; prosoma 0.72-0.77 long, 0.54-0.57 wide. Size of the eyes variable, PM separated by 1.75-2.25 times their diameter; AM not visible in dorsal view. Colour: prosoma reddish brown, eye region yellowish brown, fovea, striae and margin greyish; legs orange brown, base of tibiae whitish; abdomen grey. Prosoma (Figs 10-11): AM separated by 0.75 their diameter, from the AL by 3 times their diameter; PM separated by 1.7 their diameter, from the PL by their diameter. Chelicerae: with 12 indistinct stridulating ridges. Legs: spine formula of tibiae 2211; LSpTiI= 0.6; LSpTiIV=0.8. MtI=0.46. Palp (Figs 12-14): tibia with three apophyses, a small, blunt retrolateral one, a large, blunt median one with parallel margins, and a small, sharper prolateral one. Suprategular apophysis well developed, triangular, with basal tooth. Embolus describing an oval, distal third with small membrane.

Female

Measurements: total length 1.7-1.9; prosoma 0.64-0.72 long, 0.54-0.59 wide. Colour and general appearance as in the male. Prosoma unmodified. PE separated by their diameter. Legs: LSpTiI=0.8; LSpTiIV=1.6. Epigyne (Figs 15-16): median fissure relatively long, posteriorly showing small part of the dorsal plate. Dorsal plate nearly triangular, much wider than long. Vulva (Fig. 17): spermathecae U-shaped, mesal branch not parallel to the median fissure

Distribution

The extreme north of the central part of Algeria, from Tiaret in the west to Tizi Ouzou in the east.

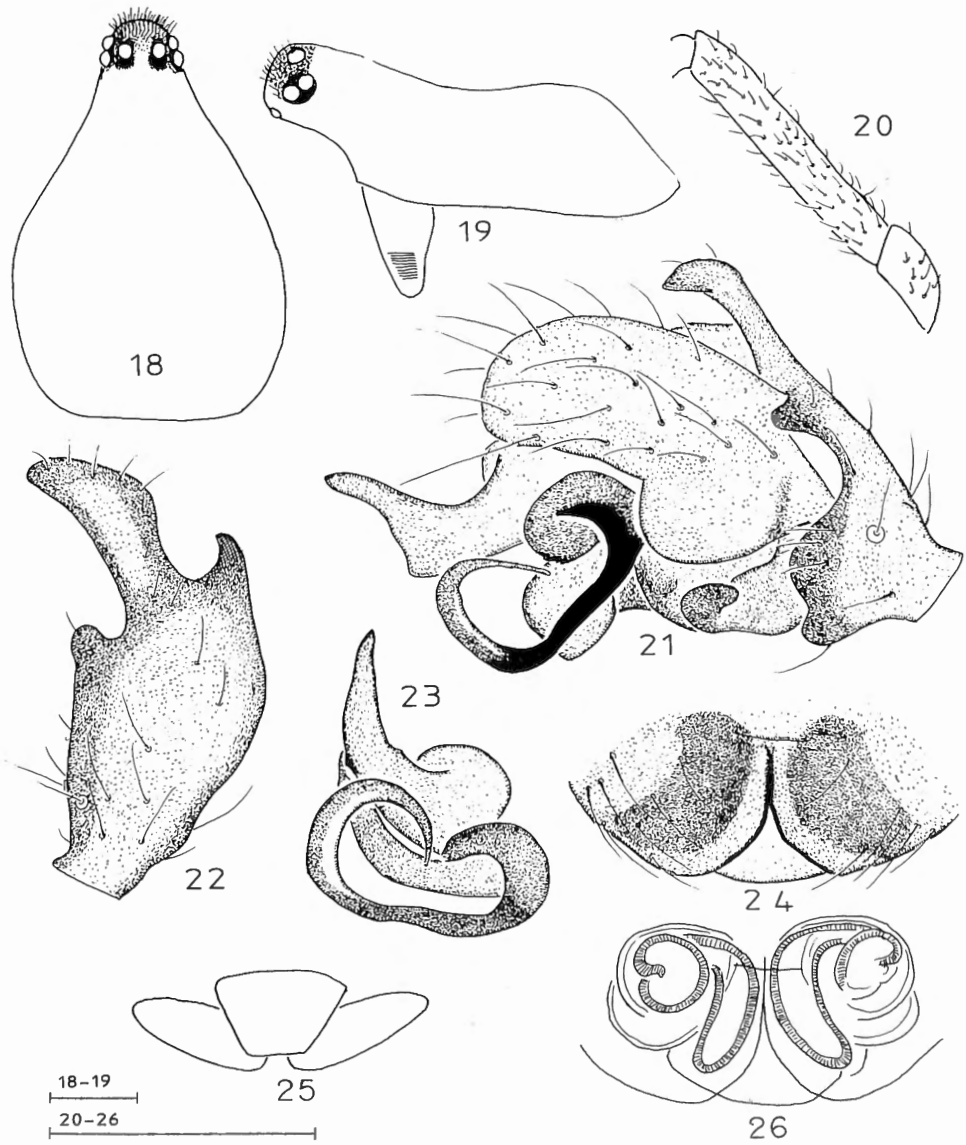
***Araeoncus martinae* sp. n.**

Type material

Holotype male, from Algeria, wilaya de Boumerdes, in coastal marsh along Oued Reghaia, 3.V.1988; 2 female paratypes, same locality, 25.IV-13.VI.1988; deposited in IRSNB.

Other material examined

ALGERIA: Saida: Cascades de Tifrit, 825m, 3♂♂ 12 ♀♀, herbs near a waterfall, 4.IV.1984. MOROCCO: Chechaouen: 10 km E. Chechaouaen, 500m, 1♀ in litter of *Q. suber* forest, 11.IV.1984.



Figs 18-26. – *Araeoncus martinae* sp. n. — 18. Male prosoma, dorsal view – 19. Idem, lateral view – 20. Male tibia I, lateral view – 21. Male palp, lateral view – 22. Male palpal tibia, dorsal view – 23. Embolic division, antero-lateral view – 24. Epigyne, ventral view – 25. Idem, postero-ventral view – 26. Vulva, ventral view. (scale line: 0.2 mm).

Diagnosis

Closely related to *A. hanno*. Males are easily distinguished by the shape of the cephalothorax, and by the basally constricted median apophysis of the palpal tibia. Females and their epigynes are very similar, but differ by the more trapezoid dorsal plate.

Etymology

The species is dedicated to my friend Martine De Mulder.

Description

Male

Measurements: total length 1.7 (1.6-1.8); prosoma 0.83 (0.83-0.96) long, 0.53 (0.56-0.62) wide; legs:

	Fe	Pa	Ti	Mt	Ta
I	0.62	0.17	0.52	0.44	0.31
IV	0.61	0.16	0.52	0.44	0.32

Colour: prosoma reddish brown, spot before fovea, striae and margin grey-brown; chelicerae yellow-brown; sternum brown, darker towards margin; legs orange brown, tibiae whitish basally; abdomen dark grey. Prosoma (Figs 18-19): cephalic part raised, strongly protruding over the chelicerae. Eye region with many short hairs; AM separated by their diameter, from the AL by 3 times their diameter; PM separated by 1.5 their diameter, from the PL by their diameter. Chelicerae: with about ten poorly developed stridulating ridges. Legs: Ti I furnished with numerous, hooked bristles (Fig. 20), Ti II with few hooked bristles, Ti III-IV normal. Spine formula 2211. TmI=0.4. LSpTiI=0.3, LSpTiIV=1.3. Palp (Figs 21-23): very similar to the one of *A. hanno*, differing by the median apophysis of the tibia with constricted base, and the relatively longer median part of the embolus.

Female

Measurements: total length 1.3-1.7; prosoma 0.64-0.70 long, 0.50-0.62 wide. Colour and general appearance as in the male. Prosoma: unmodified. AE separated by the diameter of the AM; PM separated by their diameter, from the PL by 0.75 times their diameter. Legs: LSpTiI=1, LSpTiIV=1.6. Epigyne (Figs 24-25): very similar to that of *A. hanno*, but with the median fissure somewhat shorter, and a larger part of the dorsal plate visible. In postero-ventral view, dorsal plate more trapezoid. Vulva (Fig. 26): spermathecae with supplementary lateral coil.

Distribution

The north of Morocco and Algeria, but incompletely known.

Araeoncus toubkal sp. n.

?*Araeoncus altissimus*; Fage 1938: 120; Denis 1968: 156; Jocqué 1977: 33.

Type material

Holotype male, 2 male 2 female paratypes from Morocco, High Atlas, Toubkal Massif, 3300m, under stones, 11.V.1977, P. Hillyard leg.; deposited in BMNH.

Citations

MOROCCO: High Atlas, Toubkal Massif: Amrharbas valley, Isougan n' Ouagouns (FAGE, 1938, sub *A. altissimus*); refuge Neltner, 3200m (JOCQUÉ, 1977, sub *A. altissimus*).

Etymology

The name is a noun in apposition, derived from the type locality.

Diagnosis

Males are easily recognised by the flat, strongly elongated cephalic part of the cephalothorax and the slender, terminally angular retrolateral apophysis of the palpal tibia, as seen in lateral view; females by the protruding postero-median part of the epigyne. Regarding the male palp, the species is closer to *A. anguineus* than to *A. altissimus*, but these species differ clearly by the shape of the prosoma.

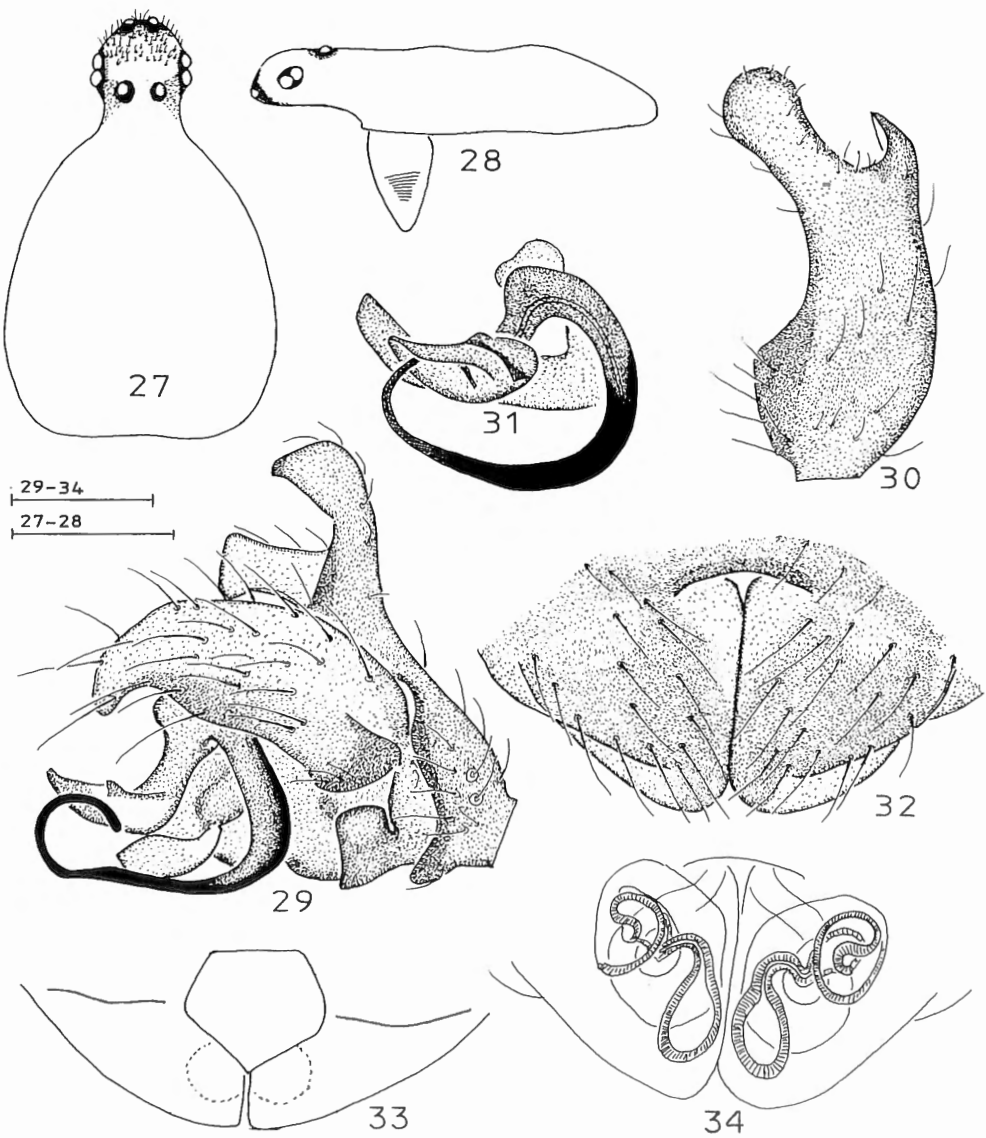
Remarks

The *Araeoncus* species cited so far from the Toubkal Massif was considered to be *A. altissimus* (FAGE, 1938; DENIS, 1968; JOCQUÉ, 1977). To our knowledge, these identifications are only based on females, and none of these specimens could be examined. The material collected by Hillyard from the Toubkal Massif includes males and females, and these are definitively different from the type series of *A. altissimus* from France (redescribed further in this paper). Until proven to the contrary, we consider all citations of *A. altissimus* from Morocco as refering to *A. toubkal* sp. n.

Description

Male

Colour: prosoma reddish brown, spot before fovea, striae and margin greyish brown; chelicerae greyish brown; sternum brown, densely tinged with grey; legs pale yellowish brown, with darkened apices. Measurements: total length 2.5 (2.3-2.6); prosoma 1.28 (1.24-1.36) long, 0.74 (0.74-0.84) wide; legs:



Figs 27-34. – *Araeoncus toubkal* sp. n.. — 27. Male prosoma, dorsal view – 28. Idem, lateral view – 29. Male palp, lateral view – 30. Male palpal tibia, dorsal view – 31. Embolic division, antero-lateral view – 32. Epigyne, ventral view – 33. Idem, postero-ventral view – 34. Vulva, ventral view. (scale line: 0.5 mm [27-28]; 0.1 mm [29-34]).

	Fe	Pa	Ti	Mt	Ta
I	0.79	0.24	0.69	0.66	0.43
IV	0.94	0.25	0.82	0.81	0.43

Prosoma (Figs 27-28): cephalic part prolonged anteriorly into a long, pubescent snout, in front bearing the AM; AM separated by their diameter, from the AL by twice their diameter; PM separated by 2 times their diameter, from the PL by 1.5 times their diameter. Chelicerae: with 10 indistinct stridulating ridges. Legs: spine formula 2211. Spines on Ti I-II very short, on Ti III-IV longer: LSpTiI=0.2, LSpTiIV=0.9; TmI 0.51. Palp (Figs 29-31): femora and patellae prolonged. Tibia prolonged over the cymbium into a large antero-dorsal apophysis, terminally split into a rounded lobe with a strong tooth at its mesal side. Paracymbium with long basal part. Tailpiece transverse, with widened base. Suprategular apophysis long and linear, terminally bluntly pointed. Terminal apophysis ridged, enclosing the tip of the embolus. Embolus long and linear, describing an oval.

Female

Measurements: total length 2.3-2.4; prosoma 1.00-1.12 long, 0.74-0.80 wide. AE separated by the diameter of the AM, PE separated by the diameter of the PM. Legs: spine formula 2211. LSpTiI=1.2, LSpTiIV=1.5. Epigyne (Figs 32-33): plates with postero-median prolongation, separated by a long fissure, anteriorly limited by a curved ridge. Dorsal plate invisible in ventral view, in dorsal view trapezoid. Vulva (Fig. 34): spermathecae oval, close to the median fissure.

Distribution

Morocco, Massif du Toubkal.

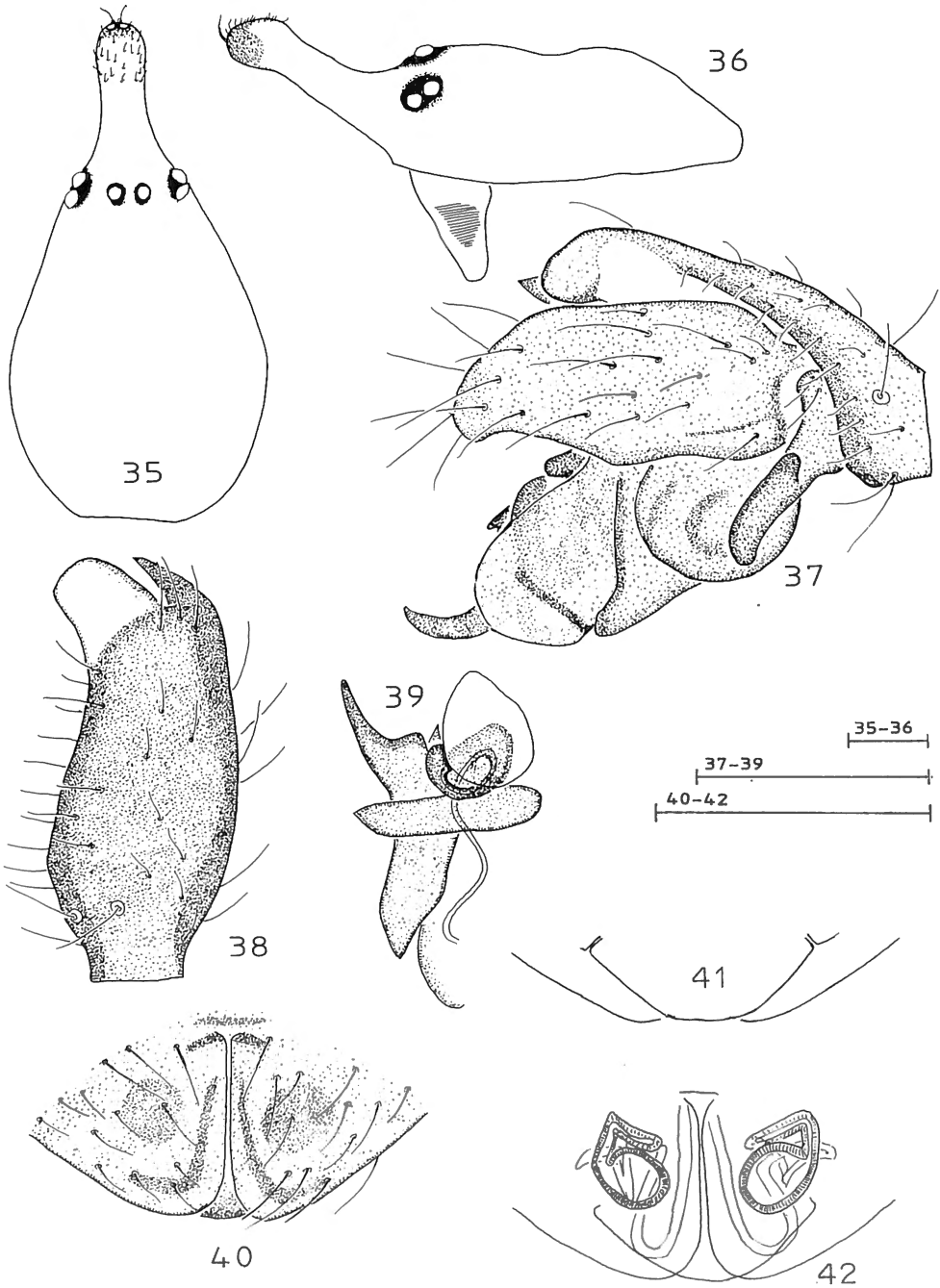
Delorrhipis fronticornis Simon, 1884

Delorrhipis fronticornis Simon 1884: 697 (descr. male, female); Simon 1885: 28.

? *Erigone digiticeps*; Pavesi 1884: 46 (misidentification).

Material examined and citations

ALGERIA: Annaba: Annaba (Bône) (SIMON, 1884). Blida: Parc National de Chrea, Djebel Mouzaia, 1200m, 2♀♀ among stones around lake Mouzaia, 26.VI.1985. Boumerdes: Reghaia, 5m, 2♂♂ 2♀♀ in pitfalls in coastal march, 3.V-13.VI.1988. Wil. Guelma: Aïn Regada E., 600m, 1♂ 1♀ between herbs along the Oued Zinati, 22.XI.1989. Skikda: Collo-Tamanart, 15m, 9♂♂ 4♀♀ in pitfalls in *Alnus* forest, 6.VI.1987. Tissemsilt: Theniet-el-Had, 1500m, 7♀♀ in wet grassland around a pool, 5.V.1989. TUNISIA: Jendouba: Aïn Draham (SIMON, 1884). Tunis: around Tunis (PAVESI, 1884, sub *Erigone digiticeps*).



Figs 35-42. – *Delorrhipis fronticornis* Simon. — 35. Male prosoma, dorsal view – 36. Idem, lateral view – 37. Male palp, lateral view – 38. Male palpal tibia, dorsal view – 39. Embolic division, ventral view – 40. Epigyne, ventral view – 41. Idem, postero-ventral view – 42. Vulva, ventral view. (scale line: 0.2 mm).

Remarks

We consider PAVESI's (1884) citation of *Dactylopisthes digiticeps* as *Delorrhipis fronticornis*. His identification was based on the 'remarkable' prosoma of the species, which occurs in *S. fronticornis* as well. *D. digiticeps* is only known from the south of France.

Description

Male

Measurements: total length 2.3-2.8; prosoma 1.38-1.64 long, 0.66-0.84 wide. Colour: prosoma with reddish-brown cephalic part, and orange-red thoracic part; chelicerae reddish-brown; sternum dark grey-brown, tinged with orange-red; legs orange-red, basal part of tibiae narrowly whitish; abdomen dark grey. Prosoma (Figs 35-36): cephalic part strongly elongated into a pubescent snout, bearing the AM. PM separated by 2/3 their diameter, from the PL by 1.5 their diameter. Legs: spine formula 2211; SpTiI=0.6, SpTiIV=1.25; TmI=0.31. Palp (Figs 37-39): femur strongly elongated. Tibia elongated, with small antero-median incision, dividing the tip in a sharp tooth and a rounded lobe. Protegulum covered by a large membrane. Suprategular apophysis encircling the radix; linear, terminally membranous and pointed. Embolus relatively small, circular, terminally rounded.

Female

Measurements: total length 2.2-2.8; prosoma 0.90-1.04 long, 0.66-0.86 wide. Prosoma: unmodified; in lateral view with median concavity. AM separated by 2/3 their diameter, from the AL by twice their diameter; PM separated by their diameter, from the PL by 1.5 times their diameter. Legs: SpTiI=1.2; SpTiIV=2. Epigyne (Figs 40-41): plates gently rounded posteriorly, separated by a long fissure, a duct parallel to the fissure and the spermathecae mostly visible in transparency. Dorsal plate posteriorly just visible, in postero-median view trapezoid, much wider than long. Vulva (Fig. 42): spermathecae relatively small, rounded.

Distribution

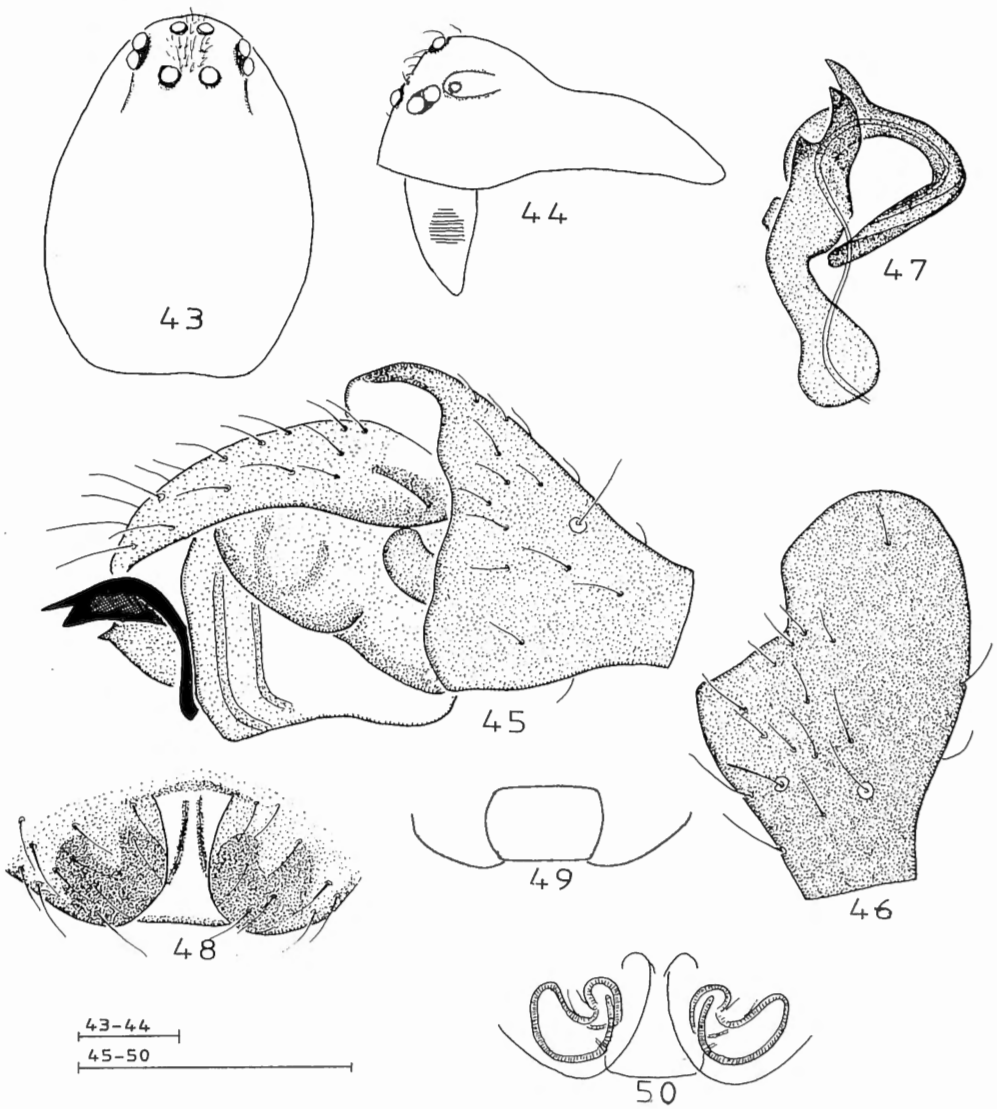
France, Spain, Crete, Algeria, Tunisia. A widespread species, but rarely collected, and mostly in small numbers, in contrast to other species living in similar conditions, i.e. wetlands. It could be an important indicator species for particular types of rare wetlands.

***Diplocephalus graecus* (O.P.-Cambridge, 1872)**

Erigone graeca O.P.-Cambridge 1872: 755; Simon 1885: 28.
Entelecara nuncia; Simon 1884: 625.
Diplocephalus graecus; Denis 1955: 204; Denis 1968: 156; Thaler 1977: 558.
Plaesiocraerus dimidiatus Denis 1945: 206.
Diplocephalus dimidiatus; Denis 1964a: 384.

Material examined and citations

ALGERIA: Alger: Bab Ezzouar, 25m, 1♀ in pitfall in rough grassland, 8.XII.1986. Bainem, 200m, 1♀ among stone in grassland, 1.I.1988. Bordj-el-Bari, 15m, 1♂ in garden, 25.IV.82. El Harrach, 25m, 1♀ in pitfall in garden, 29.I.1985. Eucalyptus, 25m, 2♀♀ in pitfall in garden, 28.IV.1988, and 1♂15.I.1990. Aïn Temouchent: Aïn Tolba, 250m, 2♀♀ among stones in dry grassland, 19.I.1988. Annaba: Djebel Edough, Seraidi, 810m, 2♀♀ in litter in *Quercus faginea* forest, 24.XI.1989. Bejaia: Tichi, 5m, 1♀ among stones in dunes, 18.IV.1982; idem, 1 male by beating *Acacia* trees, 21.VI.1988. Blida: Atlas Blidéen, Meurdja, 950m, 9♀♀ by beating *Cedrus* branches, 20.IV.1988; Chrea, 1500m, 1♀ in *Cedrus* forest, 24.XI.1984. Hammam Melouane, 125m, 1♀ along Oued Bou Maan, 7.IV.1987. Meftah, Djebel Zerouela, 400m, 1♂ 1♀ in rough grassland, 7.IV.1987. Djebel Mouzaia, 1250m, 2♀♀ among stones around lake Mouzaia, 14.IV.1988. Ravin de l'Oued Kebir (SIMON, 1884). Bordj Bou Arreridj: Sidi Embarek, 900m, 1♀ in rough grassland, 27.II.1990. Bouira: Massif du Djurdjura, Aït Ouabane, 1410m, 1♂ among stones in mountain grassland, 11.VI.1988; idem, Tikjda, 1400m, 4♀♀ in mountain grassland, 11.VI.1984. Boumerdes: Reghaia, 5m, 1♀ in coastal marsh, 11.IV.1982; idem, 15 m, 1♀ by beating *Populus alba* trees, 3.V.1988. Sidi Daoud, 35m, 4♀♀ among stones along Oued Sebaou, 4.XII.1987. Zemmouri, 10m, 1♀ in *Pinus halepensis* litter, 27.IV.1984. Chleff: E. Damous, 10m, 2♂♂ 5♀♀ by beating *Pistacea lentisca*, 17.IV.1987. Constantine: Aïn Sissaoui, 550m, 3♀♀ among stones along Oued Boumerzouk, 22.XI.1989. Constantine (SIMON, 1884). Djelfa: Djelfa, Djebel Senalba, 1450m, 1♀ in pitfalls in *Pinus halepensis* forest, 28.II.1989. El Tarf: Cap Rosa, 50m, 3♀♀ in pitfalls in *Quercus coccifera* bushes, 9.III.1988. El Kala, Lake Oubeira, 10m, 1♀ in litter bordering the lake, 1.III.1990. El Kala, near Lake Tonga, 10m, 1♂ in *Pinus halepensis* forest, 23.XI.1989. Lake Tonga, 20m, 7♀♀ among stones in *Quercus suber* maquis, 23.XI.1989. Guelma: E. Aïn Regada, 600m, 1♀ in herbs along Oued Zenata, 22.XI.1989. E. Bouchegouf, 600m, 1♀ in herbs along Oued Seybouse, 22.XI.1989. Medea: Col de Beni Chicao, 1230m, 1♀ in *Quercus ilex* litter, 21.XII.1987. Oran: La Macta, 1♀, among stones in open grassland, 8.I.1985. N. Misserghin, 200m, 1♀ in flooded orchard, 25.IV.1984. S. Oran, Sebkha Daiet el Bagrat, 100m, 1♂ between *Salicornia*, 15.IV.1984. E. Oran, forêt de Msila, 400m, 3♀♀by beating *Quercus suber* trees, 15.IV.1984. Setif: Setif (SIMON, 1884). Skikda: Bouchata, 400m, 4♀♀among stones in grassland, 2.III.1990. Souk Ahras: Bou Hadjar, Barrage de la Cheffia, 250m, 1♂ 2♀♀ among stones in grassland, 22.XI.1989. Tipasa: Zeralda, 10m, 1♂ 1♀ in *Quercus coccifera* litter, 24.II.1989. Tissemsilt: Theniet-el-Had, 1400m, 1♂ by beating *Cedrus* trees, 17.XI.1987; idem, 1550m, 1♀ in mountain grassland, 3.V.1984. Tizi Ouzou: Boghni, 180m, 1♂ along oued Boghni, 25.V.1989. Between Chabet-el-Ameur and Tizi Ghenif, 125m, 1♂ 1♀ among *Oxalis* along the Oued Djemaa, 1.V.1984. Massif du Djurdjura, Tala Guilef, 1400m, 2♀♀ among stones in mountain grassland, 23.V.1984. Timizar Laghbar, 210m, 2 ♀♀ among stones bordering *Quercus faginea* forest, 25.II.1990. Tizi Boussouil, 1700m, 1♀ in pitfalls in *Juniperus* maquis, 6.V.1990. 5 km E. Tizi Ouzou, 80m, 1 ♀, herbs in wet grassland, 25.I.1990. Tlemcen: SE Tlemcen, Col d'Hafir, 1350m, 1 ♀ by beating *Quercus suber* branches, 6.V.1984. 5 km E. Tlemcen, 850m, 1♀ among stones along a dry rivulet, 23.IV.1984. MOROCCO: Ifrane: 5 km N. Ifrane, 1550m, 1♂ among stones in *Quercus suber* forest, 14.V.1984. Kenifra: Forêt de Mamora: 1♀, 24.V.1934, A. Ball leg. (IRSNB). Marrakech: Oued Tensift, 1♀, 15.VI.1934, A. Ball leg. (IRSNB). Oued Nefifik (DENIS, 1955); Estuarie de l'Oued Regreg (DENIS 1968). Ben Nabet, Zénata, Aïn-es-Sebaa, Aïn Tiki, Berrechid, Mogador (DENIS, 1964a). TUNISIA: Beja: Oued Zergha, 300m, 1♂ by beating cultivated *Olea* trees, 17.III.1986. Bizerte: Lac Ichgeul, 15 m, 1♀, stones in pasture, 25.I.1995. Kairouan: Cherichera (THALER, 1977); Hayeb-el-Ayoun, 1♀, stones in steppe, 26.I.1995. Nabeul: El Haouaria, 1♀, 19.IV.1993. Zaghouan: E. Saouaf, 1♀, 750m, stones in *Juniperus* maquis, 24.I.1995, J. Van Keer leg. Zriba village, 1♀ in grassland along Oued El Hammmam, 24.I.1995. Kessera (SIMON, 1885).



Figs 43-50. – *Diplocephalus graecus* (O.P.-Cambrige). — 43. Male prosoma, dorsal view – 44. Idem, lateral view – 45. Male palp, lateral view – 46. Male palpal tibia, dorsal view – 47. Embolic division, ventral view – 48. Epigyne, ventral view – 49. Idem, postero-ventral view – 50. Vulva, ventral view. (scale line: 0.2 mm).

Diagnosis

Males of this species are easily distinguished by the shape of the male cephalic tubercle and of the palpal tibia, females by the epigyne with wide median fissure with median constriction.

Description

Male

Measurements: total length 1.5-1.9; prosoma 0.76-0.80 long, 0.56-0.58 wide. Colour: prosoma brown, spot before fovea, striae and margin dark brown; chelicerae and legs yellowish to orange-brown; sternum dark brown; abdomen dark grey. Prosoma (Figs 43-44): with small cephalic tubercle and short post-ocular sulci, provided with a pit smaller than the diameter of the AL. Eyes: AM separated by their diameter, from the AL by 1.5 times their diameter; PM separated by 1.25 times their diameter. legs: Spine formula 2211; SpTiI=0.75, SpTiIV=1; TmI=0.35-0.45. Palp (Figs 45-47): tibial apophysis prolonged over the cymbium, rounded. Suprategular apophysis poorly developed, only represented by a short, truncate knob. Embolic division with elongated tail-piece with large anterior apophysis with basal tooth and two terminal teeth (only one visible in ventral view). Embolus narrow, semicircular, terminally rounded, with strong basal hook.

Female

Measurements: total length 1.8-2.2; prosoma 0.71-0.82 long, 0.52-0.62 wide. Generally as the male, but without cephalic tubercle. AE as in the male, PE separated by 1.5 times their diameter. Epigyne (Figs 48-49): plates relatively widely separated by a broad fissure constricted in the middle. Dorsal plate trapezoid. Vulva (Fig. 50): spermathecae saucer-shaped, close to the postero-median border of the plates.

Distribution and ecology

S. Europe, Northern Africa. One of the commonest erigonids of the Mediterranean region, often occurring in man-made or man-influenced habitats.

***Diplocephalus sabulicolus* sp. n.**

Diplocephalus sp. A Thaler 1977: 558 (descr. ♀).

Type material

Holotype male, 1 male 3 female paratypes from Algeria, wilaya de M'sila, réserve intégral de Mergueb, 540m, pitfalls in steppe, 25.I.1988; deposited in I.R.S.N.B.

Other material examined

ALGERIA: Djelfa: Djelfa, Djebel Djellal, 1400m, 1♂ in pitfalls in open *Pinus halepensis* forest, 23.III.1990, 1♂ 9.I.1991 and 1♀ 9.IV.1991. M'sila: Aïn el Hadjel, Réserve intégral de Mergueb, 540m, 1♂ 3♀♀ in pitfalls in steppe, 25.I.1988 (type series); idem, 1♂ 1♀ 14.V.1990. Saida: Between Saida en Merdja, 850m, 1♂ 1♀ in pitfalls in sandy soil along a rivulet, 18.I.1990. Tipasa: Zeralda, 10m, 3♂♂ in pitfalls in *Quercus coccifera* maquis in dunes, 23.II.1988. TUNISIA: Kairouan: Kairouan (THALER, 1977, sub *Diplocephalus* sp. A).

Diagnosis

Besides its pale colour, this species is recognised by the peculiar shape of the male cephalothorax and palpal tibia, and by the widely separated, U-shaped spermathecae in the female.

Etymology

The species was exclusively collected on sandy soil, therefore the name *sabulicolus*, living in sand.

Remarks

It is beyond doubt that THALER's figures 17-19 (1977) of an unknown *Diplocephalus* species correspond with our new species.

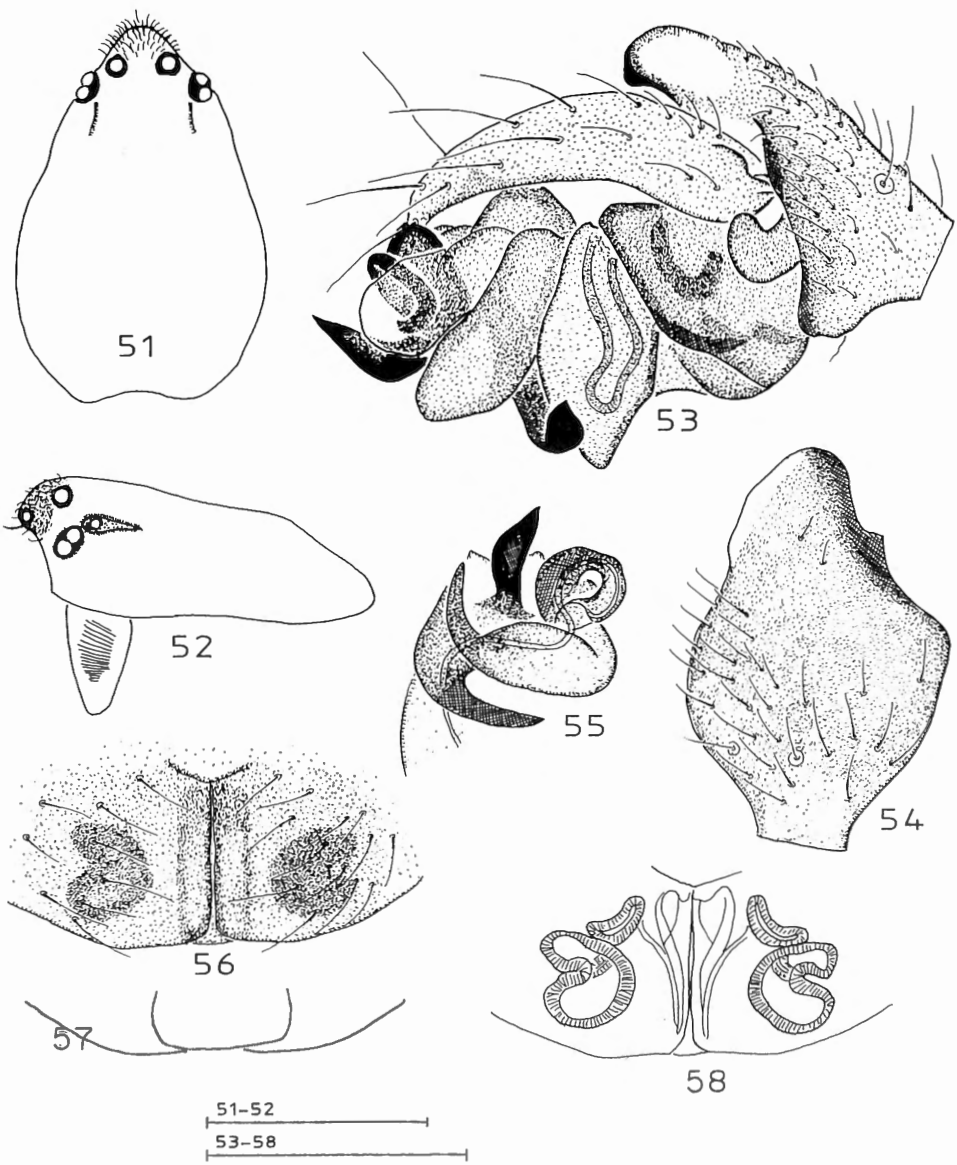
Description

Male

Measurements: total length 1.5-1.8; prosoma 0.67-0.86 long, 0.48-0.62 wide. Legs:

	Fe	Pa	Ti	Mt	Ta
I	0.72	0.21	0.58	0.52	0.38
IV	0.74	0.16	0.62	0.58	0.38

Colour: prosoma pale yellowish brown, large spot before fovea and margin grey; sternum yellow-brown; chelicerae and legs yellowish orange; abdomen grey. Prosoma (Figs 51-52): protruding and covered with short hairs in the eye region; with postocular sulci with small anterior pit, its diameter narrower than the diameter of the PL. Eyes small, AM separated by slightly less than their diameter, from the AL by 4-5 times their diameter; PE separated by twice their diameter. Legs: spine formula 2211; SpTiI=1, SpTiIV=1.2; TmI=0.31-0.35. Palp (Figs 53-55): tibial apophysis relatively wide, anteriorly rounded and with small prolateral denticle. Tegulum with ventral boss. Suprategular apophysis gently curved, pointed. Radix with basal apophysis, curved in opposite direction to the suprategular apophysis. Terminal apophysis as a short, black tooth. Embolus small, describing a small circle, terminally rounded.



Figs 51-58. – *Diplocephalus sabulicolus* sp. n. — 51. Male prosoma, dorsal view – 52. Idem, frontal view – 53. Male palp, lateral view – 54. Male palpal tibia, dorsal view – 55. Embolic division, antero-lateral view – 56. Epigyne, ventral view – 57. Idem, postero-ventral view – 58. Vulva, ventral view. [scale line: 0.5 mm (43-44); 0.2 mm (45-50)].

Female

Measurements: total length 1.5-2.2; prosoma 0.56-0.80 long, 0.52-0.61 wide. Colour and general appearance as in the male. Legs: SpTiI=1.1, SpTiIV=1.8. Prosoma: unmodified. AM separated by their radius, from the AL by 1.5 times their diameter; PM separated by their diameter, from the PL by 1.5 times their diameter. Epigyne (Figs 56-57): plates closely set, fissure with parallel margins and small anterior transverse ridge. In most specimens, spermathecae visible through cuticle as two dark, medio-lateral spots. Dorsal plate rectangular. Vulva (Fig. 58): spermathecae U-shaped, widely separated.

Distribution

Algeria and Tunisia, occurring on sandy soil, as well in coastal dunes as more to the interior at the border of the Saharian desert.

***Diplocephalus algericus* sp. n.**

Type material

Holotype male from Algeria, wilaya de Tizi Ouzou, Taguemount Azouz, 800m, pitfalls in *Q. ilex* forest, 16.IV.1989; deposited in I.R.S.N.B.

Other material examined

ALGERIA: Tizi Ouzou: Forêt de Mizrana, 300m, 7 ♀♀, stones in maquis bordering *Quercus ilex* forest, 26.I.1990. Taguemount Azouz, 800m, 1 ♂ in pitfalls in *Q. ilex* forest, 16.IV.1989 (type specimen). Tlemcen: between Tal Terny and Beni Hadjel, 1175m, 3 ♀♀, in *Juncus* tufts along an 'oued', 6.V.1984.

Diagnosis

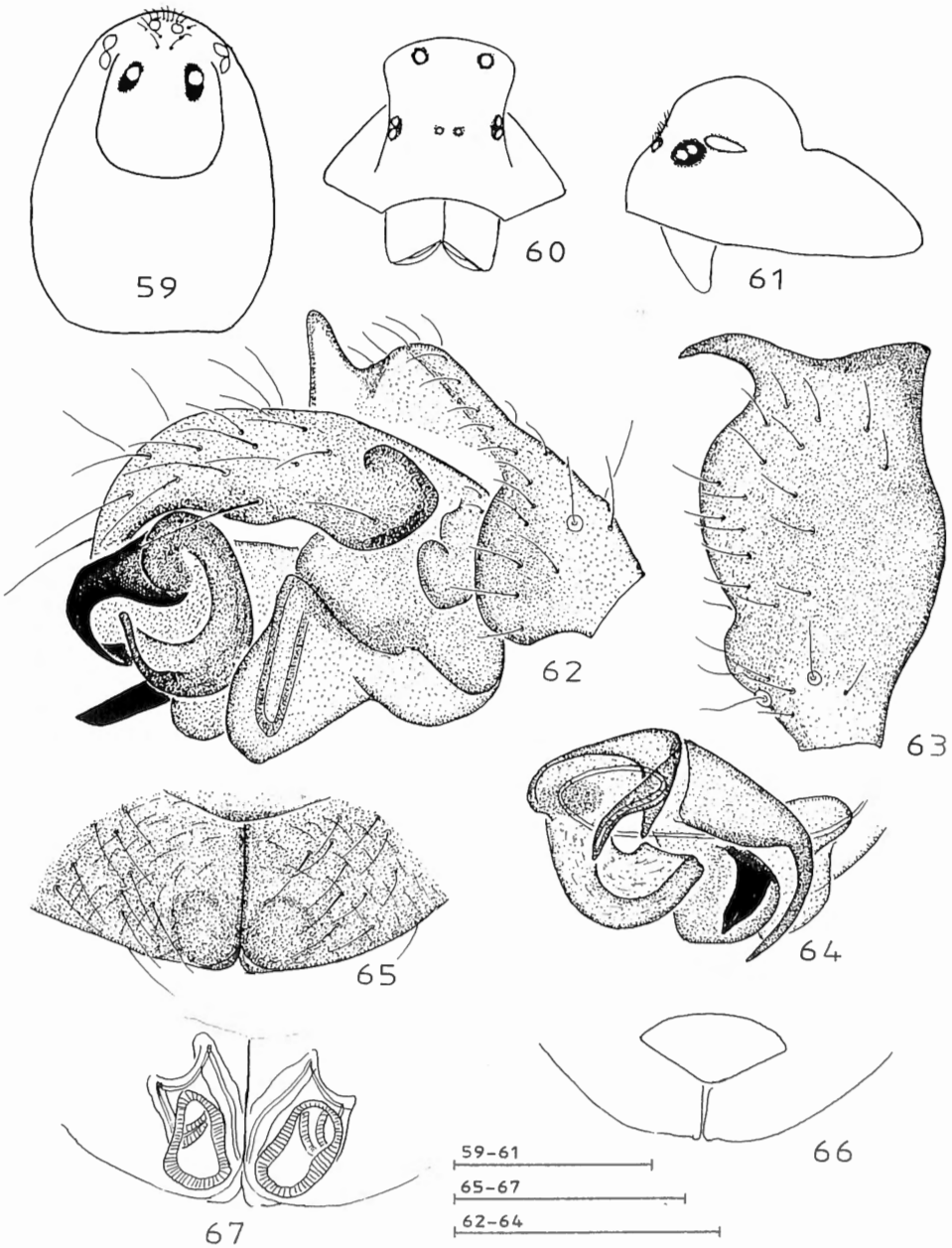
Males are easily distinguished by the shape of the prosoma and the palpal tibia. Females have the spermathecae situated in the mesal corners of the epigyneal plates.

Etymology

The species was discovered in Algeria, hence the obvious name *algericus*.

Remarks

Males and females were collected at distances of 50 km but in comparable habitats. They are tentatively described here as belonging to the same species.



Figs 59-67. – *Diplocephalus algericus* sp. n. – 59. Male prosoma, dorsal view – 60. Idem, frontal view – 61. Idem, lateral view – 62. Male palp, lateral view – 63. Male palpal tibia, dorsal view – 64. Embolic division, antero-lateral view (right palp) – 65. Epigyne, ventral view – 66. Idem, postero-ventral view – 67. Vulva, ventral view. (scale line: 0.5 mm [59-61]; 0.2 mm [62-67]).

Description

Male

Measurements: total length 1.6; prosoma 0.61 long, 0.55 wide. Legs:

	Fe	Pa	Ti	Mt	Ta
I	0.42	0.16	0.37	0.30	0.29
IV	0.52	0.14	0.43	0.36	0.34

Colour: prosoma brown, eye region and region behind cephalic tubercle greyish. Legs yellowish brown, Ti with basal part distinctly whitish; abdomen dark grey. Prosoma (Figs 59-61): head elevated into a large, rounded tubercle with some frontal hairs; PM on top of the tubercle, separated by 4 times their diameter; elongated sulci, without a pit. Legs: spine formula 2211; SpTiI=1, TiIV lacking a spine; TmI=0.41. Palp (Figs 62-64): tibial apophysis prolonged over the cymbium, terminally with prolateral blunt apophysis and retrolateral curved hook. Cymbium with basal tubercle. Basal branch of paracymbium with two hairs. Suprategular apophysis a pointed, gently curved hook. Embolic division with poorly developed tailpiece; terminal apophysis straight, pointed, strongly chitinised; embolus terminally pointed, with subterminal tooth, and basally with large, nearly circular apophysis.

Female

Measurements: total length 1.8-2.2; prosoma 0.72-0.84 long, 0.52-0.66 wide. Colour and general appearance as in the male. Legs: SpTiI=1, SpTiIV=2. Prosoma: unmodified. PM separated by their diameter, from the PL by 1.25 times their diameter. Epigyne (Figs 65-66): plates with parallel margin, with rectangular basal corners, anteriorly limited by an indistinct, transverse ridge. Dorsal plate trapezoid, invisible in ventral view. Vulva (Fig. 67): spermathecae oval, situated in the mesal corners of the plates, generally visible through cuticle.

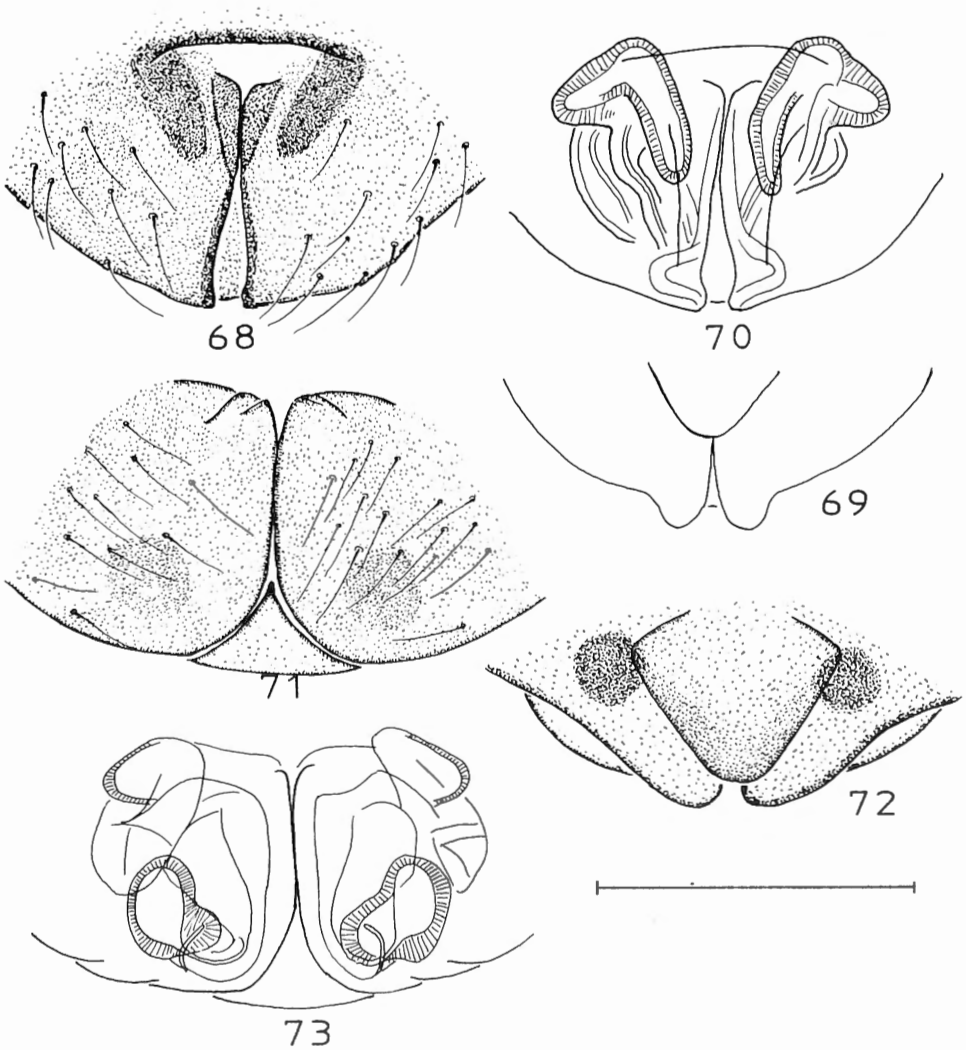
Distribution

Incompletely known, in Algeria from Tlemcen in the west to Tizi Ouzou in the east.

Diplocephalus sp.

Material examined

MOROCCO: Al Hoceima: Ketama, 1030m, 1 ♀, stones in grassland, 20.IV.1984. Chechaouen: N. Chechaouen, 520m, 1 ♀ in herbs along a rivulet, 20.IV.1984.



Figs 68-73. – *Diplocephalus* sp. a. — 68. Epigyne, ventral view – 69. Idem, postero-ventral view – 70. Vulva, ventral view. – Figs 71-73. *Diplocephalus* sp. b. – 71. Epigyne, ventral view – 72. Idem, postero-ventral view – 73. Vulva, ventral view. (scale line: 0.2 mm).

Remarks

At the moment, this species cannot be identified. As it was collected in the extreme North-west of Morocco, it possibly is a species occurring in S.W. Europe as well. It could be an insufficiently described *Diplocephalus* female from this region.

Description

Female

Measurements: Total length 2.1-2.2; prosoma 0.78-0.81 long, 0.57-0.58 wide. Legs: SpTiI1=0.9, SpTiIV=1.75; TbMtI=0.43. Epigyne (Figs 68-69): plates mesally touching in their basal half, diverging and with raised margins in their distal half; anteriorly limited by a triangular depression and a distinct transverse ridge. Vulva (Fig. 70): spermathecae L-shaped, having an anterior position. Dorsal plate triangular, invisible in ventral view.

Diplocephalus cristatus Simon, 1884

Diplocephalus cristatus Simon 1884: 570; Simon 1926: 494.

No North African material could be examined, and until material has been verified, this species does not belong to the North African Fauna. Possibly, SIMON's citation (1884) concerns females of another *Diplocephalus* species described in this paper.

REMARKS ON SOME OTHER MEDITERRANEAN SPECIES

Araeoncus altissimus Simon, 1884

Araeoncus altissimus Simon 1884: 640 (descr. ♂).

Type material

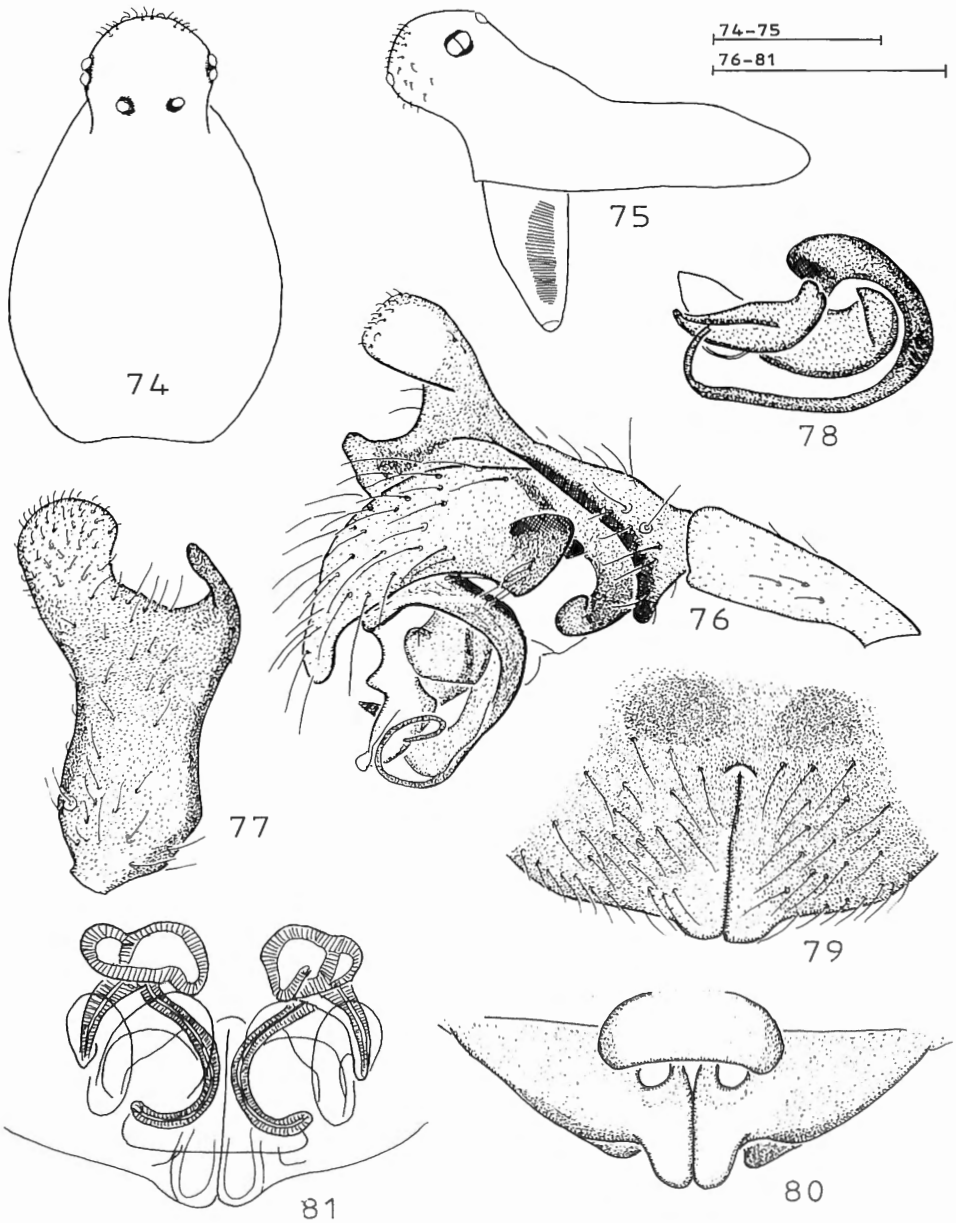
Lectotype male, 3 ♂♂ 3 ♀♀ paralectotypes, by present designation, from France, Pyrénées Orientales, without further locality (MNHNP 173).

Remarks

The three female paratypes belong to two different species, of which one has a prolonged (Fig. 79), the other a straight posterior margin of the epigyne (Fig. 71). DENIS (1948a, 1968) figures the last one as the female of *A. altissimus*, but we presume this is not correct.

Distribution

The species was previously cited from the French Pyrénées, the French Provence, the Italian Dolomites, the Swiss Alps, the Moroccan Atlas and the Caucasus.



Figs 74-81. *Araeoncus altissimus* Simon. — 74. Male prosoma, dorsal view – 75. Idem, lateral view – 76. Male palp, lateral view – 77. Male palpal tibia, dorsal view – 78. Embolic division, antero-lateral view – 79. Epigyne, ventral view – 80. Idem, postero-ventral view – 81. Vulva, ventral view. (scale line: 0.5 mm [74-75]; 0.2 mm [76-81]).

CAMBRIDGE's (1912) citations from the Swiss Alps were never confirmed and should be checked. Citations from Morocco probably all concern *Araeoncus toubkal* sp. n., as indicated above. The male cited by TANASEVITCH (1987) from the Caucasus has a very similar palpal structure, but the author indicates that the shape of the cephalothorax and the colour is quite different. DENIS' citations from the Provence (1949) and the Dolomites (1963) concern females; considering that *Araeoncus* females are very difficult to identify, and that Denis possibly did not recognize the exact female of *A. altissimus*, these citations have to be doubted. All this material should be revised. We think it is most likely that *Araeoncus altissimus* is another endemic species of the South-eastern Pyrénées. Only the citations from the Pyrénées of SIMON (1884, 1926) and DENIS (1933, 1959) would then be reliable.

Araeoncus discedens Simon, 1884

Araeoncus discedens Simon 1884: 639 (descr. ♂, ♀).

Type material

Lectotype male, 4♂♂ 5♀♀ paralectotypes, by present designation, from «Gallia méridionale», without further locality (MNHNP 4397).

Other material examined and citations

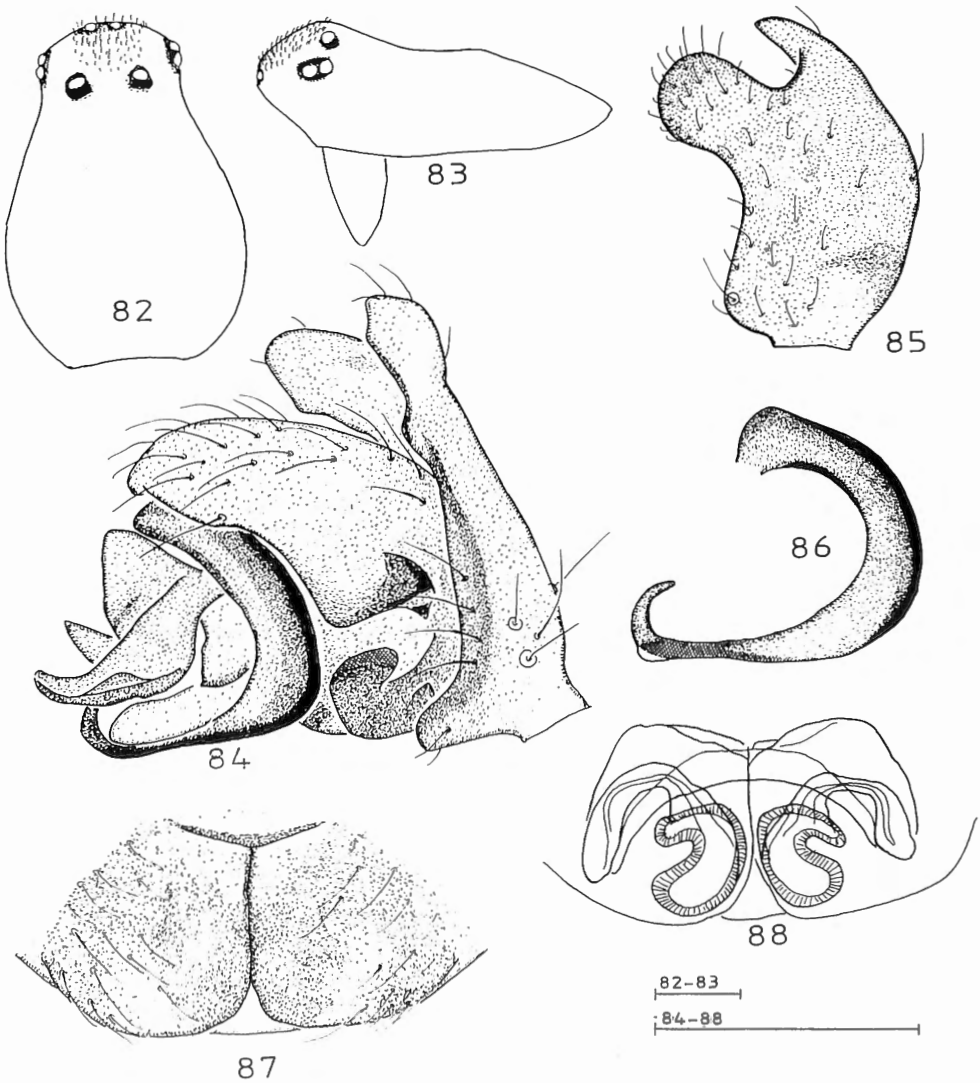
FRANCE: «Gallia méridionale», type series (MNHNP 4397). Cantal: le Lioran (SIMON, 1882). Haute Garonne: Doline de Terreblanque (DENIS, 1953b). Hautes Pyrénées: Vallée du Gave d'Arratilbe, 2020m (DENIS, 1953a). Pyrénées Orientales: Mont Canigou (SIMON, 1926); Col des Hares (SIMON, 1884); Etang de la Coumasse (DENIS, 1952); Montlouis (SIMON, 1884); Targassone (SIMON, 1926). Monts Dore: Lac de Bourdouze (DENIS, 1948b); Tourbière de Barguesse (DENIS, 1948b). ITALY: Carnia: Comelico, Passo Cavallino (CAPORIACCO, 1926). SPAIN: Cantabria: Picos de Europa, Fuente De, 1900m, 2♂♂ 3♀♀ among stones around a lake, 10.VII.1985, R. Bosmans leg. Gerona: Nuria, Traje de las Milleres, 2200m, 1♂ in montane grassland, 9.VII.1991. Puerto de Tosas, 1800m, 1♀ in pitfall near spring in *Pinus* forest, 10.VII.1991, R. Bosmans leg.

Remarks

Recent figures of this species do not exist, and these are therefore presented here.

Diagnosis

Males of this species differ from all other *Araeoncus* species by the presence of a tooth on the paracymbium.



Figs 82-88 *Araeoncus discedens* Simon. — 82. Male prosoma, dorsal view – 83. Idem, lateral view – 84. Male palp, lateral view – 85. Male palpal tibia, dorsal view – 86. Embolus, antero-lateral view – 87. Epigyne, ventral view – 88. Vulva, ventral view. (scale line: 0.2 mm).

Distribution

Pyrénées, south of France, Italy; new to Spain. CAPORIACCO's (1926) citation from Italy however needs confirmation.

ACKNOWLEDGEMENTS

C. Rollard, J. Heurtault (MNHNP) and P. Hillyard (BMNH) are thanked for the loan or communication of material.

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