REVISTA IBÉRICA de Aracnología

ARTÍCULO:

Notes on Roncus (Pseudoscorpiones: Neobisiidae) from the Eastern Pyrenees: new synonymy and description of a new species

Hans Henderickx
Department of Biology, Universiteit Antwerpen (UA), Groenenborgerlaan 171, 2020 Antwerpen, Belgium,
(Address for correspondence: Hemelrijkstraat 4, B-2400 Mol)
hans.henderickx@pandora.be

Juan A. Zaragoza
Departamento de Ecología, Facultad de Ciencias, Universidad de Alicante, E-03080 Alicante, Spain
juanzeta@terra.es

Revista Ibérica de Aracnología
ISSN: 1576 - 9518.
Dep. Legal: Z-2656-2000.
Vol. **11**, 30-VI-2005
Sección: Artículos y Notas.
Pp: 47−59.

Edita:
Grupo Ibérico de Aracnología (GIA)
Grupo de trabajo en Aracnología de la Sociedad Entomológica Aragonesa (SEA)
Avda. Radio Juventud, 37
50012 Zaragoza (ESPAÑA)
Tef. 976 324415
Fax. 976 535697
C-elect.: amelic@telefonica.net

Director: Carles Ribera
C-elect.: cribera@ub.edu

Indice, resúmenes, abstracts vols. publicados:
http://entomologia.rediris.es/sea/publicaciones/ria/index.htm

Página web GIA:
http://entomologia.rediris.es/gia

Página web SEA:
http://entomologia.rediris.es/sea

ARTÍCULO:

Notes on *Roncus* (Pseudoscorpiones: Neobisiidae) from the Eastern Pyrenees: new synonymy and description of a new species

Hans Henderickx & Juan A. Zaragoza

Abstract:
Roncus judsoni sp.n., a new hypogean *Roncus* from Catalonia, Spain, is described. *Roncus drescoi* Heurtault, 1986 is proposed to be a junior subjective synonym of *Roncus duboscqi* Vachon, 1937 and the importance of the group of microsetae close to trichobothria *eb/esb* as a specific taxonomic character is emphasized.
Key words: Pseudoscorpiones, Neobisiidae, *Roncus judsoni* sp. n., *Roncus drescoi*, *Roncus duboscqi*, microsetae, Pyrenees, France, Spain.
Taxonomy: *Roncus judsoni* sp. n.

Notas sobre *Roncus* (Pseudoscorpiones: Neobisiidae) de los Pirineos Orientales: Nueva sinonimia y descripción de una nueva especie.

Resumen:
Se describe *Roncus judsoni* sp. n., un nuevo *Roncus* hipogeo de Cataluña, España. *Roncus drescoi* Heurtault, 1986 se propone como sinónimo subjetivo júnior de *Roncus duboscqi* Vachon, 1937 y se enfatiza la importancia del grupo de microsedas cercanas a los tricobotrios ***eb/esb*** como carácter taxonómico específico.
Palabras Clave: Pseudoscorpiones, Neobisiidae, *Roncus judsoni* sp. n., *Roncus drescoi*, *Roncus duboscqi*, microsedas, Pirineos, Francia, España.
Taxonomia: *Roncus judsoni* sp. n.

Introduction

In December 1996 several *Roncus* specimens were collected in a Spanish cave (Tortellà, Catalonia, eastern Pyrenees) and from the French cave of Ultrera (eastern Pyrenees), the latter being one of the type localities of *Roncus drescoi* Heurtault, 1986. Although similar, the specimens from these two caves showed differences in the pedipalpal dimensions and the pattern of microsetae on the pedipalpal hand, indicating that they were not conspecific. Because the specimens from Ultrera were also similar to the description of *Roncus duboscqi* Vachon, 1937, type material of *R. duboscqi* and *R. drescoi* was borrowed from the Muséum National d'Histoire Naturelle, Paris (MNHN). A comparative study of the types and the new material revealed that *R. duboscqi* and *R. drescoi* are synonymous and that the Spanish material represents an undescribed species.

Material and methods

All specimens were hand captured, transported in polyethylene tubes and photographed alive. Microscopical examination was carried out with a PHILIPS ESEM wetscan electron microscope and a ZEISS AXIOLAB microscope which was also used for the measurements. Temporary slide mounts were made in glycerol. All measurements are in mm; [length (L) x width (W)], the ratio is the length/width index of an article. Chaetotaxic nomenclature follows CHAMBERLIN (1931).

Redescription of *Roncus duboscqi* Vachon 1937 and *Roncus drescoi* Heurtault 1986.

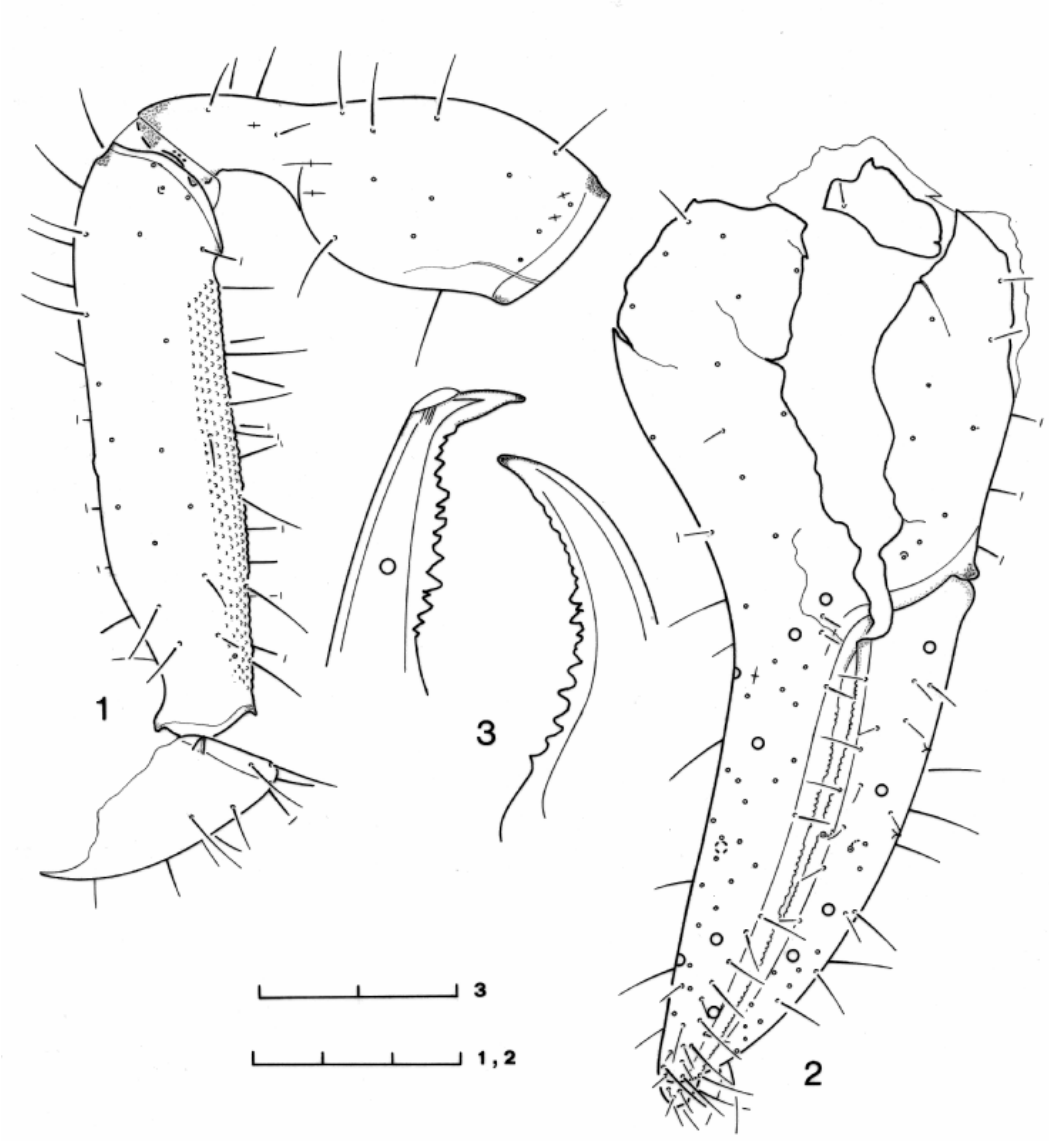
Roncus duboscqi Vachon 1937

TYPE MATERIAL. Male holotype (Figs 1-3) mounted on six slides (numbered 483-488) and marked: "*Roncus (R.) duboscqi* Vachon, type, Mt. du Canigou, France, deposited in the pseudoscorpion collection of the MNHN.

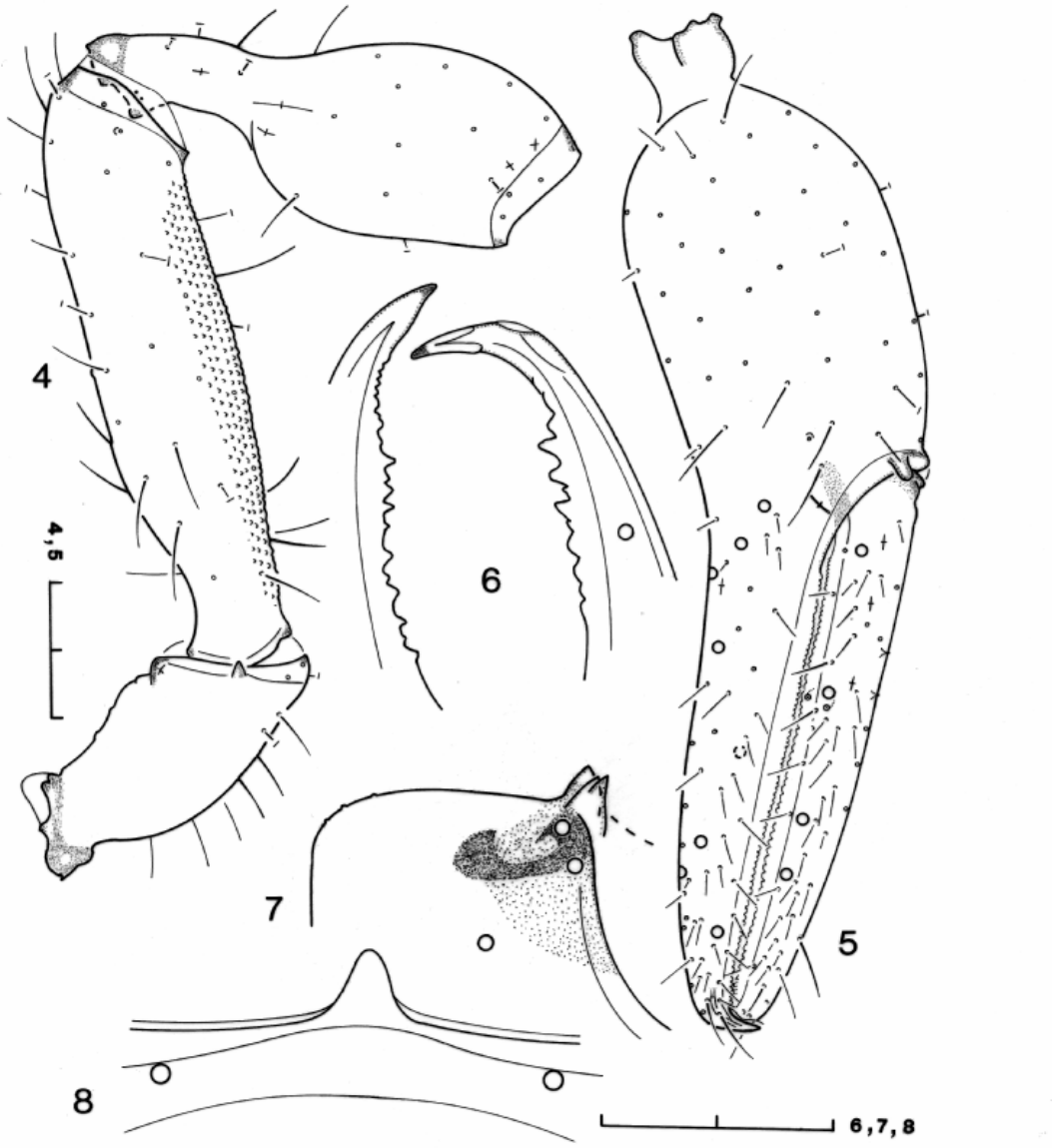
NEW MATERIAL. Two males from eastern Pyrenees (Figs 4-8), France, Ceret, Massane, Gardini det. 1987, MNHN 16946. One female from France, Argelès, eastern Pyrenees, forêt de la Massane, hêtraie en face du refuge, litière, 18 October 1994, leg. J.C. Ledoux and S. Gil, M. Judson det. 2001, MNHN collection.

REDESCRIPTION OF HOLOTYPE. Specimen in very poor condition, some appendages with multiple fractures or mounted in an unusual position that does not permit complete observation or measurement. The opisthosoma is mounted in two separate, incomplete parts, but the genital area is lost.

Chelicera (Fig. 3) with 6 setae on hand and 1 seta on movable finger, situated 0.65 from base. Spinneret reduced to a flattened hyaline tubercle. Fixed finger with 7 apical protuberances and 10 teeth; movable finger with 3 apical protuberances, 12 partially broken teeth (basal 2 small and rudimentary).



Figs 1-3: *Roncus duboscqi* Vachon, male holotype. **1** Dorsal view of left palp, without chela; **2** Lateral view of left chela; **3** Partial view of fingers of left chelicera. Divisions of scale lines: 0.1 mm (Figs 1, 2), 0.05 mm (Fig. 3).



Figs 4-8: *Roncus duboscqi* Vachon, male from Massane. **4** Dorsal view of left palp, without chela; **5** Lateral view of left chela; **6** Partial view of fingers of right chelicera; **8** Anterior margin of carapace, showing epistome. Female from Massane: **7** Anterior process and medial corner of coxa I. Divisions of scale lines: 0.1 mm (Figs 4, 5), 0.05 mm (Figs 6, 7, 8).

Pedipalps (Figs 1-2): femur granulated on anterior side, one small tubercle on posterior margin, one glandular pore medio-distally. Patella smooth, with three micropores at base of pedicel. Fixed finger dental line with 71 teeth reaching between trichobothria ***isb-eb***; distance between trichobothria ***isb*** and ***ist*** 1.60 times longer than the distance between ***ib/isb*** and 0.91 times that between ***ist/it***; only 2 microsetae between the trichobothria ***eb/esb***. Movable finger dental line with 68 teeth almost reaching trichobothrium ***b*** and proximal referred to fixed finger dental line; distance between trichobothria ***sb*** and ***st*** 0.88 times that between ***b/sb***; one sensillum near dental margin and another away from the margin, both clearly distal to trichobothrium ***sb***; two external glandular pores, one basal and one distal to trichobothrium ***sb***; one lyrifissure basal to trichobothrium ***b***, one between ***b*** and ***sb*** and one at level of ***sb***.

The width of legs I and IV is unclear because they are flattened beneath the coverslip. Claws with a tiny tooth in middle of the external side. Leg IV tibia TS ratio 0.62, basitarsus TS ratio 0.20, telotarsus TS ratio 0.37; subterminal setae 0.07 mm long, with three rami, the largest ramus 0.03 mm, middle one 0.02 mm, with some external and internal spinules, the shortest one smooth and 0.01 mm.

DESCRIPTION OF ADDITIONAL MATERIAL. Opisthosomal pleura and legs yellowish, tergites slightly sclerotized. Carapace and pedipalps reddish-brown.

Carapace longer than broad, maximum width at posterior half, with one pair of eyes with flattened lens 0.07-0.08 mm long and 0.02-0.03 mm high, situated 0.06-0.08 mm from anterior margin. Epistome (Fig. 8) equilateral triangle shaped, apex blunt, L=0.02-0.03 and W= 0.02-0.04. Chaetotaxy: 24-26 setae, formula: 4: 8 : 6-8 : 6. Some glandular pores present, 1 to 4 on each side between anterior and ocular zones.

Tergal chaetotaxy I-X: 6-7 : 9-10 : 10-11 : 11-12 : 10-12 : 11 : 11 : 11 : 11 (4 pseudotactile setae: PTS) : 9 (4TS). Segment XI with 13 setae (6TS). Anal cone with 2 dorsal and 2 ventral setae.

Manducatory process with 4 setae; palp coxa with 7-9 setae, pedal coxae: I: 6-7, II: 6-8, III: 5-6, IV: 7-8. Anterior process of coxa I (Fig. 7) with short, simple or tricuspid tooth, apex pointed or blunt, L= 0.02-0.03, W= 0.02; medial process not prominent, with some tiny teeth. Male genital area with 15-16 setae on sternite II, 7-8 along anterior margin of genital opening; sternite III with 15-17 setae, 5-7 along posterior margin of genital opening; genital opening with 2+2 internal setae. Female genital opening with 10 microsetae on sternite II and 19 on sternite III. Chaetotaxy of sternites IV-X: 10-11 : 14 : 14-15 : 13-14 : 13-15 : 11-13 : 11-14 (2 TS). 3+3 microsetae on stigmata of sternites III and IV.

Chelicera (Fig. 6) with 6 setae on hand and 1 seta on movable finger, distal 0.61-0.67 from base. Spinneret represented by a flattened, hyaline tubercle, lower in males. Fixed finger with 5-7 apical protuberances and 12-13 teeth; movable finger with 3-5 apical protuberances and 8-14 teeth, one subdistal tooth larger than the others; in both fingers also small rudimentary teeth (not counted) often alternated with larger teeth. Flagellum with 8 denticulate blades, length of proximal blade about one third that of others; serrula exterior with 32 blades, serrula interior with 24-26.

Pedipalps (Figs 4-5): trochanter with one large, rounded, lateral tubercle and 1-3 very small ones; dorsally with tiny denticulation in distal half. Femur granulated along whole of anterior side, one tubercle near middle of posterior side, one glandular pore medio-distally. Patella smooth, pedicel longer than one third of patella, one glandular pore medio-distally and two micropores at base of pedicel. Hand internally granulated at base of fixed finger, one pore on external side on a small protuberance close to base of fingers, one micropore at base of pedicel. Fixed finger dental line with 71-79 teeth up to distal trichobothrium ***esb***; *nodus ramosus* reaching 4/5th tooth from tip; distance between trichobothria ***isb*** and ***ist*** 1.35-1.62x longer that between ***ib/isb*** and 0.82-1.07x longer than between ***ist/it***; 3 microsetae (one male with 6!) between the trichobothria ***eb***/***esb***; one lyrifissure at level of trichobothria ***eb***, ***ib*** and ***et***. Movable finger dental line with 66-73 teeth, almost reaching trichobothrium ***b*** and proximal referred to fixed finger dental line; distance between trichobothria ***sb*** and ***st*** 1.00-1.42x that between ***b/sb***; one sensillum near dental margin, level with or slightly distal to trichobothrium ***sb***, another sensillum close to ***sb*** but more distal; two external glandular pores close to trichobothrium ***sb***; one lyrifissure basal to trichobothrium ***b***, one between ***b/sb*** and one distal to ***sb***.

Claws of legs I and IV with a tiny tooth in middle of external side. Leg IV tibia TS ratio 0.58-0.61, basitarsus TS ratio 0.18-0.23, telotarsus TS ratio 0.39-0.43; subterminal setae L=0.07, with three rami, the largest (L=0.03-0.04) and the medium (L=0.02) with some external and internal spinules, the shortest (L=0.01) smooth. Measurements and ratios in Table II.

Roncus drescoi Heurtault 1986

EXAMINED SYNTYPE MATERIAL. Female syntype (Figs 9-11) mounted in a slide in Canada balsam and labelled: *"Roncus (P.) drescoi* Heurtault, Pyrénées orientales, grotte Ultrera, Coll. Dresco". Deposited in MNHN.

TOPOTYPE MATERIAL. One male and two females from France, eastern Pyrenees, Ultrera cave, 27 December 1996, leg. H. Henderickx, deposited in coll. Departamento Ecología – Universidad de Alicante**.**

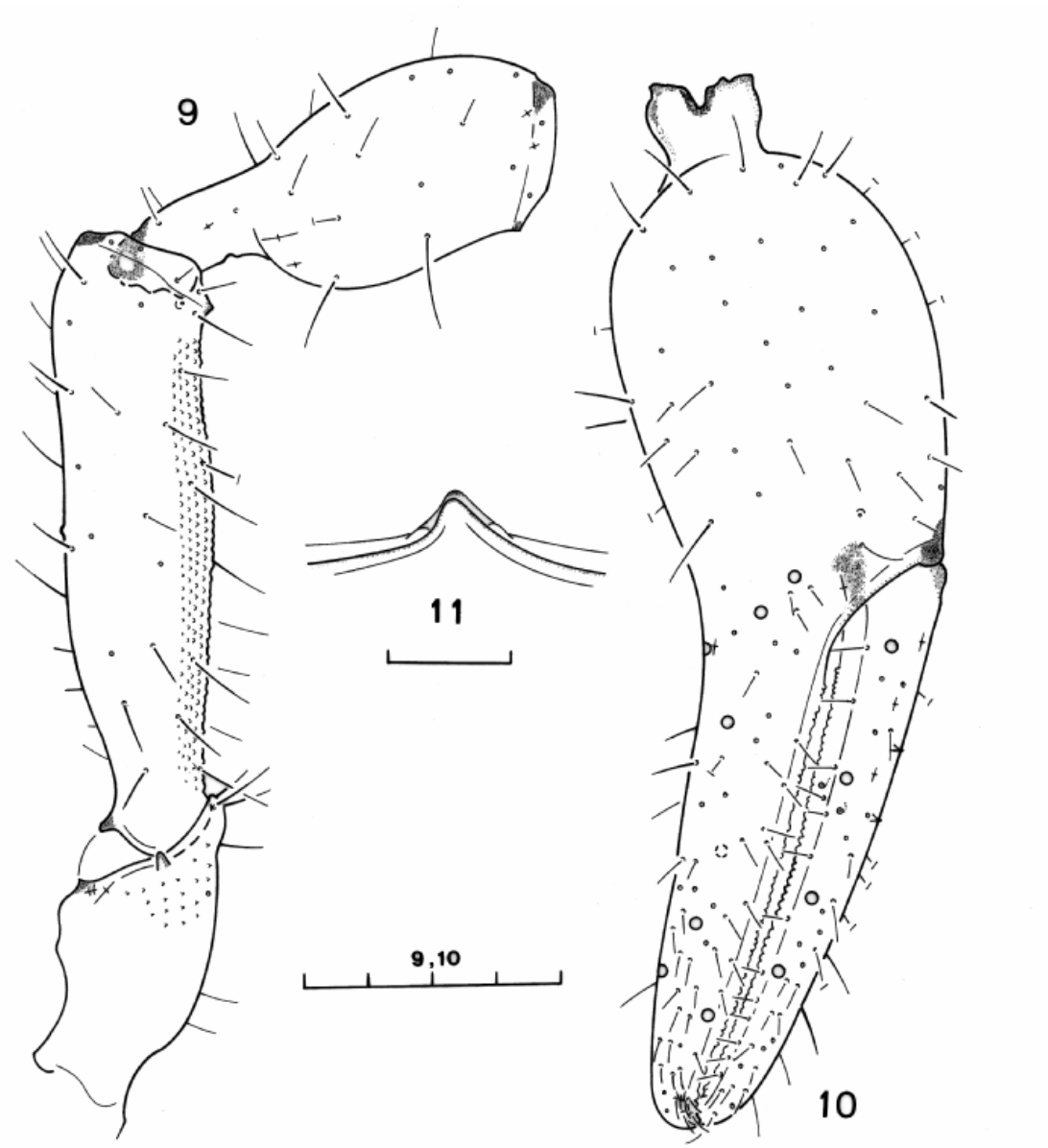
DESCRIPTION OF TOPOTYPE MATERIAL. Most characters that coincide with the above description of *Roncus duboscqi* have been omitted. Since important parts of the *R. drescoi* sintype cannot be analysed or measured from the permanent mount, the type data are given together with the topotype data.

Carapace with one pair of eyes, lenses flattened 0.07-0.08 mm long and 0.03-0.04 mm high, situated 0.08-0.09 mm from anterior margin. Epistome equilateral triangle shaped, apex pointed or blunt, L=0.02-0.03 and W=0.02-0.03. Chaetotaxy: 24-26 setae, setal formula: 4 : 6-8 : 8 : 6. 1-3 glandular pores between anterior and ocular zones on both sides.

Tergal chaetotaxy I-X: 5-6 : 10-11 : 10-11 : 11 : 11-13 : 11 : 11 : 11 : 11 (4PTS) : 10-11 (3-4TS). Segment XI with 13 setae (6TS). Anal cone with 2 dorsal and 2 ventral setae. Palpal coxa: 7-8 setae, pedal coxae: I: 5-6 seta, II: 6-7, III: 4-5, IV: 7-8. Anterior process of coxa I with short, simple or tricuspid tooth, apically pointed or blunt, L=0.02, W= 0.02; medial process not prominent, without denticles. Male genital area with 15 setae on sternite II, 8 along anterior margin of genital opening; sternite III with 16 setae, 6 along posterior margin of genital opening; genital opening with 3+3 internal setae. Female genital opening with 8-9 microsetae on sternite II and about 15 on sternite III. Chaetotaxy of sternites IV-X: 10-12 : 14-17 : 15-16 : 14-18 : 14-16 : 15-17 : 13 (2 TS); 3+3 microsetae on stigmata of sternites III and IV.

Chelicera with 6 setae on hand and 1 seta on movable finger (0.64-0.67 from base). Fixed finger with 3-8 apical protuberances and 13-14 teeth; movable finger with 3-6 apical protuberances and 9-13 teeth, one sub distal tooth larger than the rest; in both fingers small rudimentary teeth, (not counted) often alternated with large teeth.

Pedipalps: Fixed finger of the chela with 67-74 teeth; distance between trichobothria ***isb*** and ***ist*** 1.29-2.08 x longer than that between ***ib/isb*** and 0.79-0.99 x that between ***ist/it***; 2-3 microsetae between trichobo-



Figs 9-11: *Roncus drescoi* Heurtault, female holotype. **9** Dorsal view of left palp, without chela; **10** Lateral view of left chela; **11** Anterior margin of carapace, showing epistome. Divisions of scale lines: 0.1 mm (Figs 9, 10), 0.05 mm (Fig. 11).

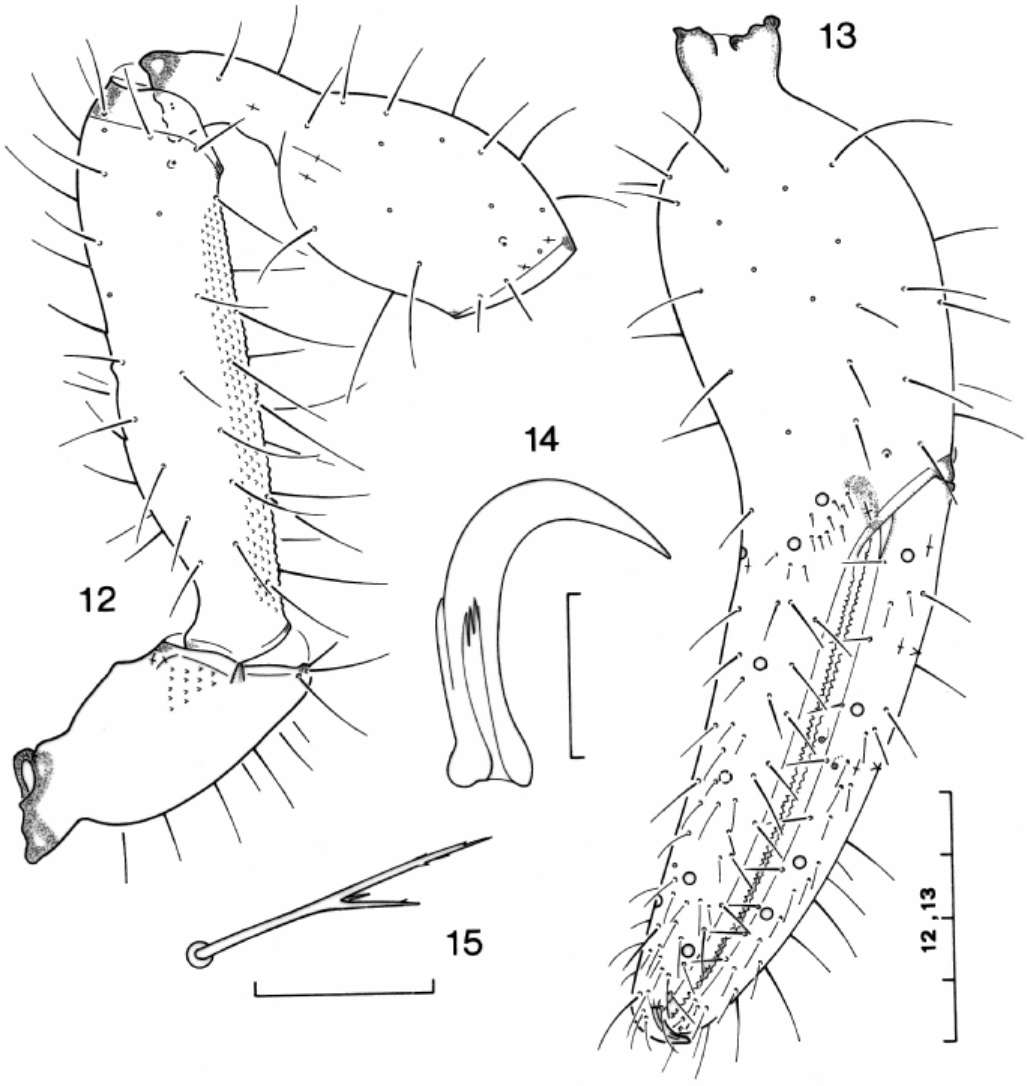
thria ***eb***/***esb*** (Fig. 22b). Movable finger with 65-71 teeth; distance between trichobothria ***sb*** and ***st*** 0.81-0.94 times that between ***b/sb***.

Leg IV tibia with TS ratio 0.56-0.62, basitarsus TS 0.16-0.22, telotarsus TS 0.34-0.36; subterminal setae 0.07-0.08 mm long, with three rami, the largest L=0.03-0.04 and the middle L=0.02 with some external and internal spinules, the shortest L=0.01, smooth. Measurements and ratios in Table III.

REMARKS

Roncus duboscqi was described by Vachon in 1937, based on one male from the Massif du Canigou, eastern Pyrenees, France. The type specimen, together with two males and one female of this species from the Massane forest, close to the type locality, have been studied.

Roncus drescoi was briefly described by HEURTAULT (1986) on syntype material from the Ultrera cave and the Cap Raederis cave, Pyrénées orientales, France. Heurtault´s unusually short description



Figs 12-15: *Roncus judsoni* sp. n., male holotype. **12** Dorsal view of left palp, without chela; **13** Lateral view of left chela; **14** Claw of telotarsus leg IV; **15** Subterminal seta of telotarsus leg IV. Divisions of scale lines: 0.1 mm (Figs 12, 13), 0.05 mm (Figs 14, 15).

was only an advance intended to be preliminary to a more complete description (Dr Mark Judson, pers. comm.). Our examination of one syntype specimen and new material collected at the type locality reveals that no significant differences can be found between the measurements, ratios and chaetotaxy of *R. duboscqi* and *R. drescoi*. *Roncus drescoi* is therefore proposed here to be a junior subjective synonym of *Roncus duboscqi*.

The distribution of *R. duboscqi* seems to be restricted to the 'massif du Canigou' (VACHON, 1937): Massane valley (BEIER, 1955), Prats de Mollo (BEIER, 1959), eastern Pyrenees, France, but HEURTAULT (1986) also recorded it from Bivès (High Pyrenees) and LECLERC & HEURTAULT (1979) recorded a possible subspecies from the Ardèche region.

R. duboscqi is recorded from France and Spain (HARVEY, 1991). Records of this species in mainland Spain were recorded from Catalonia (BEIER, 1963): provinces of Girona (BEIER, 1955, 1959, 1961) and Barcelona (BEIER, 1959, LAGAR, 1972); MAHNERT (1977) included it in his key for the Spanish *Roncus* species, based on Beier´s publications.

It is our opinion that *R. duboscqi* is probably not present in Spain: records from the Girona province may belong to the new species described below (to be confirmed), the identity of the material from the Barcelona province remains uncertain.

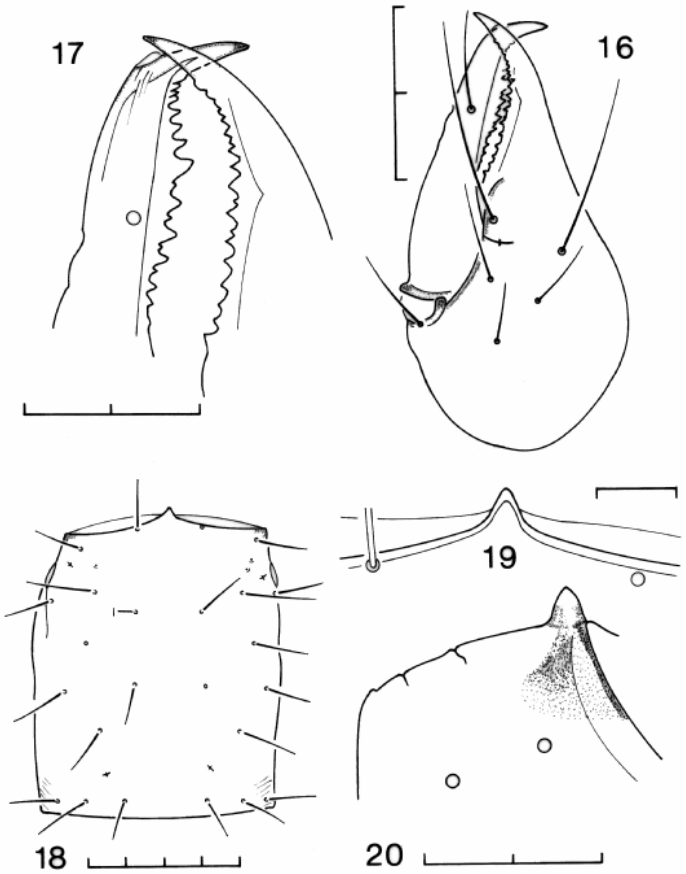
The taxonomic position of *Roncus remyi* Beier, 1934 (locus typicus also eastern Pyrenees), is close to *R. duboscqi*.

DESCRIPTION OF NEW SPECIES

***Roncus judsoni* sp. n.**

TYPE MATERIAL. Male holotype (Figs 12-20): Spain, Catalonia, Tortellà, Puig de Bassegoda, 'Cova de Poli 1', N42° 17'35,0" E 02°38'16,7", altitude 900 m. Collected on 30 December 1996 (H. Henderickx) and deposited in coll. Muséum National d'Histoire Naturelle, Paris (MNHN), two male and one female paratype from the same location and date as the holotype, labelled T1, T2, T3, one female paratype from the same location as the holotype but collected on 30 October 1996, labeled T4. Paratype T1 in coll. Henderickx, Paratype T2 and T4 deposited in Departamento Ecología –Universidad de Alicante, paratype T3 in MNHN.

DIAGNOSIS. *Roncus* species with flattened eyes, pointed epistome, 6 setae on the posterior margin of carapace, palpal femur 4.13-4.45x longer than broad, patella 2.48-2.70x, chela 3.74-3.95x, finger slightly longer than the femur in males, both articles about 1.00 mm long, with a group of 8-10 microsetae between trichobothria ***eb/esb.*** Anterior process of coxa I short and simple, tooth shaped



Figs. 16-20: *Roncus judsoni* sp. n., male holotype. **16** Left chelicera; **17** Partial view of fingers of left chelicera; **18** Carapace; **19** Anterior margin of carapace, showing epistome; **20** Anterior process and medial corner of coxa I. Divisions of scale lines: 0.1 mm (Figs 16, 18), 0.05 mm (Figs 17, 19, 20).

DESCRIPTION OF MALE HOLOTYPE. NOTE: Data between brackets correspond to paratype measurements. Opisthosomal pleura and legs yellowish, tergites slightly sclerotized. Carapace and pedipalps pale-brownish. Habitus as in Fig. 21. Carapace (Fig. 18) longer than broad, maximum width at posterior half. One pair of reduced eyes with very
flattened lens 0.08 mm long and 0.02 mm high (0.07-0.09/0.01-0.02), situated 0.09 mm (0.08-0.09) from anterior margin. Epistome (Fig. 19) equilateral triangle shaped, apex well pointed (pointed or blunt), 0.03 x 0.03 (0.02-0.03/0.03). Carapace with 24 (25-27) setae, formula 4: 8 : 6 : 6 (4 : 7-8 : 8-9 : 6). Glandular pores present, 1 or 2 on each side between anterior and ocular zones (1-3).

Tergal chaetotaxy I-X: 6 : 8 : 11 : 11 : 11: 12 : 11 : 11 : 11(4PTS) : 9 (4TS); (6 : 6-9 : 10-11 : 10-11 : 11 : 11-12 : 11 : 11 : 11 (4PTS) : 9-11(4TS)). Segment XI with 11-13(6TS) setae. Anal cone with 2 dorsal and 2 ventral setae.

Manducatory process with 4 setae; palpal coxa with 7-8 setae, pedal coxa I with 6-7 (5-7) setae, II: 5-6 (6-7), III: 5 (4-5), IV: 7 (7-9). Anterior process of coxa I (Fig. 20) with short and simple tooth shape, apically

pointed, 0.03 mm long and 0.02 mm broad (0.02-0.03/0.02); medial process not prominent, without denticles. Male genital area with 20 (19) setae on sternite II, 12 (9-10) along anterior margin of genital opening; sternite III with 13 (14-15) setae, 3 (4-5) along posterior margin of genital opening; genital opening with 3+3 (2+2) internal setae. Female genital opening with 11 microsetae on sternite II and about 13 on sternite III. Chaetotaxy of sternites IV-X: 12 : 12 : 13 : 13 : 13 : 13 : 11(2TS) (10-12 : 13-14 : 13-14 : 13 : 13 : 11-14 : 9-13(2TS). 3+3 microsetae on stigmata of sternites III and IV.

Chelicera (Figs 16-17) with 6 setae on hand and 1 seta on movable finger, 0.68 (0.65-0.69) from base. The spinneret is a flattened hyaline tubercle (slightly lower in males than in females). Fixed finger with 5 (6-8) apical protuberances and 14 (9-14) teeth; movable finger with 3 (4-6) apical protuberances and 11 (7-12) teeth, one subdistal tooth about twice as large as the rest. Small rudimentary teeth (not counted) on both fingers, often alternating with large teeth. Flagellum with 8 denticulated blades, length of proximal blade about one third that of the others; serrula exterior with 34 (31-34) blades, serrula interior with 25 (25-26) blades.

Pedipalps (Figs 12-13): trochanter with one large, rounded lateral tubercle and one (1-2) very small tubercles; with tiny denticulation in dorsal distal half. Anterior side of femur completely granulated, one tubercle at middle of posterior side, one glandular pore medio-distally. Patella smooth, pedicel longer than one third of patella, one glandular pore medio-distally and two micropores at base of pedicel. Hand internally granulated at base of fixed finger, one pore at external side close to finger base, without significant protuberance; one micropore at base of pedicel. Fixed finger dental line with 78 (74-78) teeth almost reaching trichobothrium ***esb***; *nodus ramosus* at level of 5th (4th-5th) distal tooth; distance between trichobothria ***isb*** and ***ist*** 1.27 (1.17-1.54) times longer than between ***ib/isb*** and 0.87 (0.86-1.01) times longer than that between ***ist/it***; 9 (8-10) microsetae between trichobothria ***eb***/***esb*** (Figs 13, 22a); one lyrifissure at level of trichobothria ***eb***, ***ib*** and ***et***. Movable finger dental line with 72 (67-72) teeth up to distal of trichobothrium ***b*** and proximal referred to fixed finger dental line; distance between trichobothria ***sb*** and ***st*** 1.04 (0.80-1.03) longer than distance between ***b-sb***; one sensillum near dental margin, slightly distal or level with trichobothrium ***sb***, another sensillum close to ***sb*** but more distal; two external glandular pores close to trichobothrium ***sb***; one lyrifissure basal of trichobothrium ***b***, one between ***b/sb*** and one distal of ***sb***.

Claws of legs I and IV (Fig. 14) with a tiny tooth at middle of external side. Leg IV tibia TS ratio 0.62 (0.560.65), basitarsus TS ratio 0.15 (0.17-0.19), telotarsus TS ratio: 0.36 (0.37-0.39); subterminal setae (Fig. 15) 0.09 (0.08-0.09) mm long, with three rami, the largest [L=0.05 (0.04-0.05)] and the middle (L=0.02) with some external and internal spinules, the shortest (L=0.01) smooth. Measurements and ratios as in Table III

Fig. 21: *Roncus judsoni* sp. n., habitus (locus typicus: Tortellà, 25 May 2004).

ETYMOLOGY. The species is named after the arachnologist Dr Mark Judson, to honour his work on pseudoscorpions.

DISTRIBUTION. The species is only known from the type locality, Tortellà (Cova de Poli 1), Spain. Adjacent caves were examined, but no specimens were found.

BIOLOGY. All specimens of *R. judsoni* sp. n. were found in a cave. Several specimens were found in dusk, others in complete darkness. Nevertheless, this species still has reduced eyes. Rather than troglobitic, it probably lives in humid, dark crevices and cracks in the rocks and soil. *Roncus judsoni* sp. n. shares his ecological niche with *Acanthocreagris granulata* (Beier, 1939) and the scorpion *Belisarius xambeui* Simon, 1879. The new species can be considered as troglophilic and will probably be found in the SUC (Superficial Underground Compartment).

REMARKS

According to MAHNERT´s (1977) key to the Spanish species of *Roncus*, the new species may be compared with *Roncus neotropicus* Redikorzev, 1937, but *R. judsoni* sp. n. has more short palp articles and less slender than the cave forms of the Balearic species.

Considering the French species with more or less reduced eyes (keys of GARDINI, 1982, 1991), *R. judsoni* sp. n. agrees with *Roncus euchirus* (Simon, 1879), and *R. duboscqi* in having a palp femur between 4.00 and 4.50 times longer than broad, but it differs from both these species by the relative palp finger length (longer than the femur), the finger/hand ratio (larger in

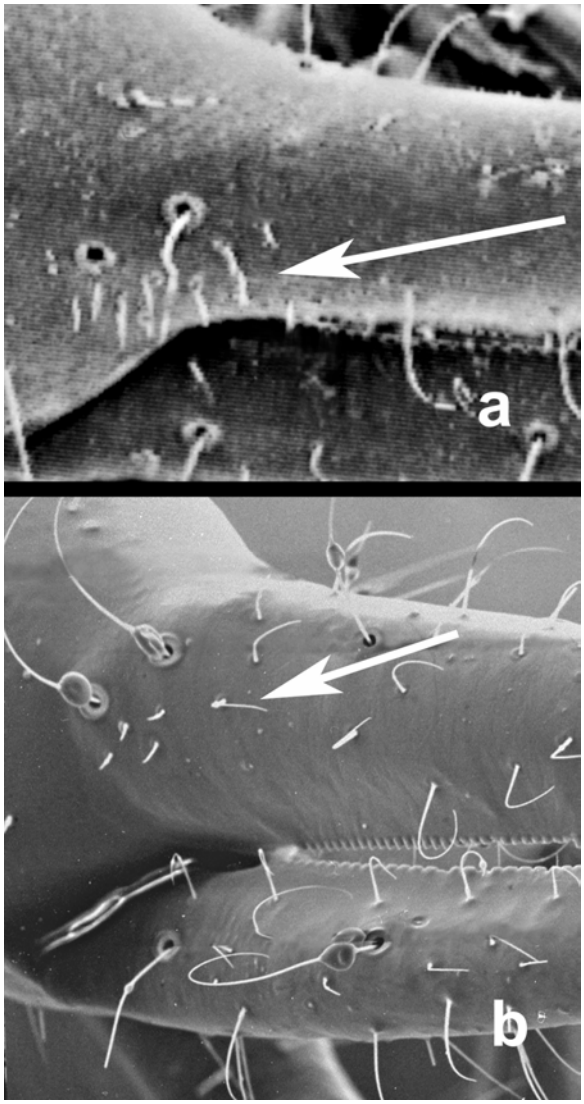


Fig. 22: a: *Roncus judsoni* sp. n., microsetae, locus typicus: Tortellà, 30 October 1996 ; b: *Roncus drescoi* Heurtault, , microsetae, locus typicus: Ultrera, 27 December 1996. The disk-like structures on most of the trichobothria are artefacts.

males) and in having more slender chela. The number of microsetae between trichobothria ***eb*** and ***esb*** is significant high (8-10) in the new species, whereas this number varies from 2 to 4 (6 in a single specimen) in *R. duboscqi*; GARDINI (1982) draws only 2 microsetae in this position for *R. euchirus*. The French species *R. remyi* differs from the new species by the absence of eyes and in having a palpal femur longer than the finger.

Compared with other western Mediterranean species and using the keys of GARDINI & RIZZERIO (1985, 1986) and GARDINI (1991, 1992, 1993) to the Italian species, the new species resembles *Roncus julianus* di Caporiacco, 1949 (northeastern Italy) in some morphometric measurement and ratios of the palp, but the chela and finger/hand ratios of *R. judsoni* sp.n. are larger. Additionally, *R. judsoni* sp. n. has no tubercles on the anterior side of the palpal femur, unlike the Italian species in which they are present.

DISCUSSION

GARDINI (1981, 1983) pointed out that BEIER´s (1963) key for the European taxa of the genus *Roncus*, based on morphometric characters, is insufficient to distinguish most epigean species and that the search for new taxonomic characters was necessary. GARDINI (1981) proposed the use of presence/absence of microsetae proximal to ***eb*** as a taxonomical characteristic. The same author (1983) resolved the *Roncus lubricus* L. Koch, 1873 « problem » by discovering that the type specimens from England posses a group of microsetae proximal to the trichobothrium ***eb.*** In some cases microsetae do not appear in that position on continental *Roncus* specimens that are currently attributed to *R. lubricus* and they might belong to other species. Continuous studies on Italian material have demonstrated that the presence or absence and/or the position (proximal, close to ***eb***, between ***eb*** and ***esb*****)** are constant characters. (Dr. Giulio Gardini, pers. comm.).

In this paper the separation of close species has been partly based on the stable characteristic " increased number of microsetae between the trichobothria ***eb*** and ***esb*** ". Such easely overlooked characteristics will appear very useful for clarifying the taxonomic status of certain species from different countries We conclude that in the genus *Roncus* a detailed description of the material is necessary, particularly with regard to the minor structures and their position: microsetae groups, sensilla, glandular pores, tubercles, etc. Descriptions should be accompanied with clear and accurate drawings that show these structures and the chaetotaxy, thus giving future investigators the opportunity to employ characteristics that are not utilized at present. Gardini´s excellent *Roncus* drawings provide a good example of this

Acknowledgements

The authors are grateful to Dr Volker Mahnert [Muséum d'histoire naturelle (MHN) Geneve] and Dr Giulio Gardini [Dipartimento per lo studio del Territorio e delle sue Risorse (Dip.Te.Ris) Genova], who offered valuable comments and suggestions for the improvement of the text.

Thanks are due to Dr Mark Judson (MNHN) for the loan of type material and for useful advice and suggestions concerning the manuscript. To Dr Luc De Bruyn, Dr Ron Verhagen [University of Antwerp (RUCA)], Dr Patrick Grootaert and Julien Cillis (Royal Belgian Institute of Natural Sciences) for laboratory facilities.

References

BEIER, M. 1934. Neue cavernicole und subterrane Pseudoscorpione. *Mitteilungen über Höhlen- und Karstforschung* **1934**: 53-59.

BEIER, M., 1955. Neue Beiträge zur Kenntnis der iberischen Pseudoscorpioniden-Fauna. *Eos, Madrid* **31**: 87-122.

BEIER, M., 1959. Ergänzungen zur iberischen Pseudoscorpioniden-Fauna. *Eos, Madrid* **35**: 113-131.

BEIER, M., 1961. Nochmals über iberische und marokkanische Pseudoscorpione. *Eos, Madrid*. **37**: 21-39.

BEIER, M., 1963. Ordnung Pseudoscorpionidea (Afterskorpione). In: *Bestimmungsbücher zur Bodenfauna Europas.* Vol. 1 Akademie-Verlag, Berlin.

CHAMBERLIN, J. C. 1931. The arachnid order Chelonethida. *Stanford University Publications, Biological Sciences* **7**(1): 1-284.

GARDINI, G., 1981. *Roncus caralitanus* n. sp. della Sardegna meridionale (Pseudoscorpionida Neobisiidae) (Pseudoscorpioni d'Italia XIII). *Bollettino della Società Entomologica Italiana* **113**: 129-135.

GARDINI, G., 1982. Compléments à la description de *Roncus euchirus* (Simon, 1879) (Pseudoscorpionida, Neobisiidae). *Revue Arachnologique* **4**: 151-155.

GARDINI, G., 1983. Redescription of *Roncus lubricus* L. Koch, 1873, type-species of the genus *Roncus* L. Koch, 1873 (Pseudoscorpionida, Neobisiidae). *Bulletin of the British Arachnological Society* **6**: 78-82.

GARDINI, G., 1991. Tre nuove specie di *Roncus* L. Koch, 1873 della Liguria occidentale (Pseudoscorpionida Neobisiidae). *Memorie della Società Entomologica Italiana* **70**: 313-334.

GARDINI, G. 1992. *Roncus belluatii*, nuova specie eutroglofila del Toiranese, Liguria occidentale (Pseudoscorpionida, Neobisiidae). *Fragmenta Entomologica* **23**: 201-211.

GARDINI, G. 1993. *Roncus caprai* n. sp. della Liguria orientale e note su *R. gestroi* Beier, 1930. *Memorie della Società Entomologica Italiana* **71**: 409-425.

GARDINI, G. AND RIZZERIO, R., 1985. Materiali per una revisione del genere *Roncus* L. Koch, 1873. I. Ridescrizione dei tipi di alcune specie italiane non cavernicole (Pseudoscorpionida, Neobisiidae). *Fragmenta Entomologica* **18**: 47-79.

GARDINI, G. & RIZZERIO, R., 1986. Materiali per una revisione del genere *Roncus* L. Koch, 1873. II. Ridescrizione dei tipi delle specie parablothroidi alpine e appenniniche. *Fragmenta Entomologica* **19**: 1-56.

HARVEY, M.S., 1991. *Catalogue of the Pseudoscorpionida*. Manchester University Press, Manchester.

HEURTAULT, J., 1986. Pseudoscorpions cavernicoles de France: revue synoptique. *Mémoires de Biospéologie* **12**: 19-32.

LAGAR, A., 1972. Contribución al conocimiento de los Pseudoescorpiones de España. I. *Miscelanea Zoologica* **3**: 17-21.

LECLERC, P. & HEURTAULT, J., 1979. Pseudoscorpions de l'Ardèche. *Revue Arachnologique* **2**: 239-247.

MAHNERT, V., 1977. Spanische Höhlenpseudoskorpione. *Miscelanea Zoologica* **4**: 61-104.

VACHON, M., 1937. Trois nouveaux Pseudoscorpions de la région Pyrénéenne française. *Bulletin de la Société Zoologique de France* **62**: 39-44.

Table I

Roncus duboscqi Vachon: ratios and measurements (length/width or length). * Vachon´s (1937) measurements.

Roncus duboscqi	♂ type		♂♂ Massane		♀ Massane	
	Ratio	Measurement	Ratio	Measurement	Ratio	Measurement
Body		2.50*		2.35-2.47		2.40
Carapace			1.15-1.24	0.77-0.79/0.64-0.67	1.12	0.75/0.67
Chelicera						
Hand		0.51	1.94-2.20	0.46-0.49/0.21-0.25	1.92	0.48/0.25
Finger		0.34		0.32-0.34		0.32
Pedipalp						
Trochanter			2.15-2.30	0.49-0.50/0.22-0.23	2.24	0.52/0.23
Femur	4.24	0.89/0.21	4.24-4.26	0.89/0.21	3.82	0.86/0.22
Patella	2.45	0.71/0.29	2.55-2.56	0.71-0.72/0.28	2.47	0.72/0.29
Pedicel		0.25		0.25-0.26		0.26
Club		0.46		0.45-0.47		0.46
Club/pedicel	1.84		1.76-1.86		1.75	
Hand			1.65-1.76	0.69-0.71/0.41-0.42	1.56	0.67/0.43
Pedicel				0.13		0.10
Finger		0.85		0.83-0.86		0.85
Chela			3.57-3.75	1.49-1.52/0.41-0.42	3.56	1.51/0.43
Chela/carapace			1.89-1.97		2.02	
Femur/carapace			1.13-1.16		1.15	
Femur/finger	1.05		1.03-1.07		1.01	
Femur/patella	1.25		1.24-1.26		1.20	
Patella/hand			0.99-1.04		1.08	
Finger/hand			1.20		1.28	
Leg I						
Femur		0.43	3.46-3.54	0.46-0.47/0.13-0.14	3.21	0.45/0.14
Patella		0.30	2.81-3.00	0.32-0.33/0.11	2.76	0.32/0.12
Tibia		0.37	4.96-5.12	0.42/0.08	4.55	0.41/0.09
Basitarsus		0.19	3.00-3.22	0.21/0.07	2.86	0.20/0.07
Telotarsus		0.31	5.25-5.75	0.32-0.36/0.06	5.11	0.33/0.06
Femur/patella	1.43		1.41-1.44		1.42	
Basitarsus/telotarsus	1.67		1.55-1.75		1.66	
Leg IV						
Femur+patella		0.80	3.15-3.17	0.77- 0.78/0.24-0.25	2.96	0.78/0.26
Tibia		0.73	5.71-6.17	0.73/0.12-0.13	5.36	0.71/0.13
Basitarsus		0.25	2.59-2.78	0.25/0.08-0.09	2.40	0.24/0.10
Telotarsus		0.42	5.15-5.56	0.42-0.45/0.08	5.06	0.43/0.08
Basitarsus/telotarsus	1.69		1.68-1.83		1.78	

Table II
Roncus drescoi Heurtault: ratios and measurements (length/width or length)

Roncus drescoi	♀ syntype		♂ Ultrera		♀♀ Ultrera	
	Ratio	Measurement	Ratio	Measurement	Ratio	Measurement
Body		2.56		2.67		2.38-2.82
Carapace	1.17	0.82/0.70	1.23	0.78/0.63	1.22-1.23	0.90/0.73-0.74
Chelicera						
Hand	1.82	0.50/0.28	2.00	0.45/0.23	1.85-1.86	0.48-0.55/0.26-0.30
Finger		0.35		0.30		0.34-0.37
Pedipalp						
Trochanter	2.34	0.58/0.25	2.45	0.49/0.20	2.08-2.18	0.52-0.54/0.24-0.26
Femur	4.02	0.98/0.24	4.30	0.84/0,20	4.00-4.04	0.93-1.00/0.23-0.25
Patella	2.44	0.78/0.32	2.67	0.68/0.26	2.51-2.52	0.74-0.79/0.30-0.32
Pedicel		0.28		0.24		0.24-0.28
Club		0.50		0.44		0.50-0.51
Club/patella	1.84		1.83		1.82-2.08	
Hand		0.80	1.71	0.65/0,38	1.51-1.59	0.75-0.82/0.47-0.53
Pedicel		0.13		0.10		0.12-0.13
Finger		0.91		0.83		0.89-0.92
Chela		1.69	3.87	1.47/0.38	3.18-3.36	1.59-1.70/0.47-0.53
Chela/carapace	2.06		1.90		1.78-1.90	
Femur/carapace	1.20		1.09		1.04-1.12	
Femur/finger	1.08		1.01		1.04-1.09	
Femur/patella	1.26		1.24		1.26	
Patella/hand	0.98		1.05		0.97-0.99	
Finger/hand	1.14		1.28		1.13-1.19	
Leg I						
Femur			3.28	0.44/0.13	3.29-3.39	0.50-0.51/0.15-0.16
Patella			2.90	0.31/0.11	2.86-3.00	0.35-0.36/0.12-0.13
Tibia			4.69	0.39/0.08	5.03-5.05	0.44-0.47/0.09
Basitarsus			3.36	0.21/0.06	2.99-3.00	0.21-0.22/0.07
Telotarsus			5.30	0.31/0.06	5.21-5.44	0.31/0.36/0.06-0.07
Femur/patella			1.40		1.42-1.45	
Basitarsus/telotarsus			1.49		1.52-1.64	
Leg IV						
Femur+patella		0.81	3.10	0.75/0.24	3.06-3.34	0.82-0.90/0.26-0.27
Tibia		0.73	5.81	0.67/0.12	5.81-5.91	0.74-0.77/0.13
Basitarsus		0.28	2.93	0.24/0.08	2.74-2.88	0.26-0.27/0.10
Telotarsus		0.47	5.37	0.40/0.07	5.35-5.41	0.45-0.46/0.08-0.09
Basitarsus/telotarsus	1.68		1.66		1.67-1.72	

Table III

Roncus judsoni sp.n.: ratios and measurements (length/width or length).

***Roncus judsoni* sp. n.**	♂ holotype		♂♂ paratypes		♀♀ paratypes	
	Ratio	Measurement	Ratio	Measurement	Ratio	Measurement
Body		2.21		2.29-2.37		1.94-2.63
Carapace	1.23	0.85/0.69	1.22-1.23	0.83-0.87/0.68-0.71	1.20-1.23	0.82-0.85/0.69
Chelicera						
Hand	2.06	0.51/0.25	1.91-2.00	0.50-0.53/0.26	1.94-2.00	0.49-0.50/0.25-0.26
Finger		0.35		0.34-0.38		0.34-0.35
Pedipalp						
Trochanter	2.29	0.56/0.25	2.19-2.34	0.52-0.58/0.24-0.25	2.28-2.45	0.53-0.54/0.22-0.23
Femur	4.45	0.98/0.22	4.13-4.30	0.93-0.99/0.22-0.23	4.21-4.37	0.92-0.93/0.21-0.22
Patella	2.60	0.79/0.30	2.48-2.70	0.76-0.81/0.30-0.31	2.55-2.59	0.74/0.29
Pedicel		0.29		0.26-0.29		0.25-0.26
Club		0.50		0.50-0.52		0.48-0.49
Club/pedicel	1.72		1.79-1.92		1.85-1.96	
Hand	1.64	0.71/0.43	1.64-1.65	0.69-0.75/0.42-0.46	1.68-1.69	0.72-0.73/0.43
Pedicel		0.12		0.13		0.12
Finger		1.01		0.96-1.00		0.91-0.93
Chela	3.95	1.70/0.43	3.82-3.90	1.63-1.74/0.42-0.46	3.74-3.78	1.60-1.64/0.43
Chela/carapace	2.01		1.96-2.00		1.93-1.94	
Femur/carapace	1.16		1.12-1.14		1.09-1.11	
Femur/finger	0.98		0.97-0.99		1.01	
Femur/patella	1.24		1.22		1.24-1.26	
Patella/hand	1.11		1.08-1.11		1.01-1.03	
Finger/hand	1.42		1.33-1.39		1.26	
Leg I						
Femur	3.43	0.50/0.14	3.40-3.43	0.48-0.49/0.14	3.47-3.48	0.48/0.14
Patella	2.96	0.35/0.12	2.87-2.92	0.33-0.35/0.12	2.91-3.01	0.34-0.35/0.11-0.12
Tibia	5.04	0.44/0.09	4.92-5.20	0.44-0.46/0.09	4.92-5.03	0.42-0.43/0.09
Basitarsus	2.91	0.22/0.07	3.00-3.04	0.21/0.07	3.00-3.03	0.21/0.07
Telotarsus	5.19	0.35/0.07	5.15-5.70	0.34-0.37/0.06-0.07	5.44-5.55	0.34-0.35/0.06
Femur/patella	1.39		1.39-1.49		1.38-1.44	
Basitarsus/telotarsus	1.63		1.62-1.72		1.62-1.64	
Leg IV						
Femur+patella	3.03	0.83/0.28	2.82-3.01	0.81-0.84/0.28-0.29	3.18-3.24	0.80-0.81/0.25
Tibia	5.70	0.77/0.14	5.46-5.52	0.75-0.77/0.14	5.52-5.80	0.72-0.73/0.13
Basitarsus	2.60	0.25/0.10	2.60-2.63	0.25-0.27/0.10	2.54-2.69	0.24-0.25/0.09-0.10
Telotarsus	5.03	0.44/0.09	4.86-5.12	0.43-0.46/0.09	4.94-5.07	0.43-0.44/0.08-0.09
Basitarsus/telotarsus	1.74		1.70-1.73		1.73-1.78	