

TWO NEW EPIGEAN PSEUDOSCORPIONS (NEOBISIIDAE, PSEUDOSCORPIONES) FROM THE MARITIME ALPS, FRANCE

B. P. M. ČURČIĆ¹, J.-M. LEMAIRE², S. B. ČURČIĆ¹, R. N. DIMITRIJEVIĆ¹, M. MILINČIĆ³,
and M. PECELJ³

¹*Institute of Zoology, Faculty of Biology, University of Belgrade, 11000 Belgrade, Serbia*

²*Natural History Museum of Nice, 06300 Nice, France*

³*Faculty of Geography, University of Belgrade, 11000 Belgrade, Serbia*

Abstract - Two species of pseudoscorpions new to science (*Neobisium montisageli* n. sp. and *Roncus peissei* n. sp.), collected in Southeastern France, are described, the diagnostic characteristics are illustrated, and their distribution is given. The possible establishment of two species groups of *Roncus* in Europe is discussed briefly in view of the importance of some of the diagnostic characteristics.

Key words: *Roncus*, *Neobisium*, Neobisiidae, pseudoscorpions, taxonomy, evolution, Maritime Alps, France.

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INTRODUCTION

In the present study, material from a single sample of pseudoscorpions collected by one of us (J.-M. L.) in 2008 is examined. The specimens studied belonged to two species new to science: *Neobisium montisageli* n. sp. and *Roncus peissei* n. sp. The epigeal taxa described in this paper are probably endemic and relict forms which inhabit habitats in the Maritime Alps in Southeastern France.

All specimens were mounted on slides in Swan's fluid (gum-chloral medium) and deposited in the collection of the Institute of Zoology, Faculty of Biology, University of Belgrade, 11000 Belgrade, Serbia.

SYSTEMATIC PART

NEOBISIUM MONTISAGELI, NEW SPECIES

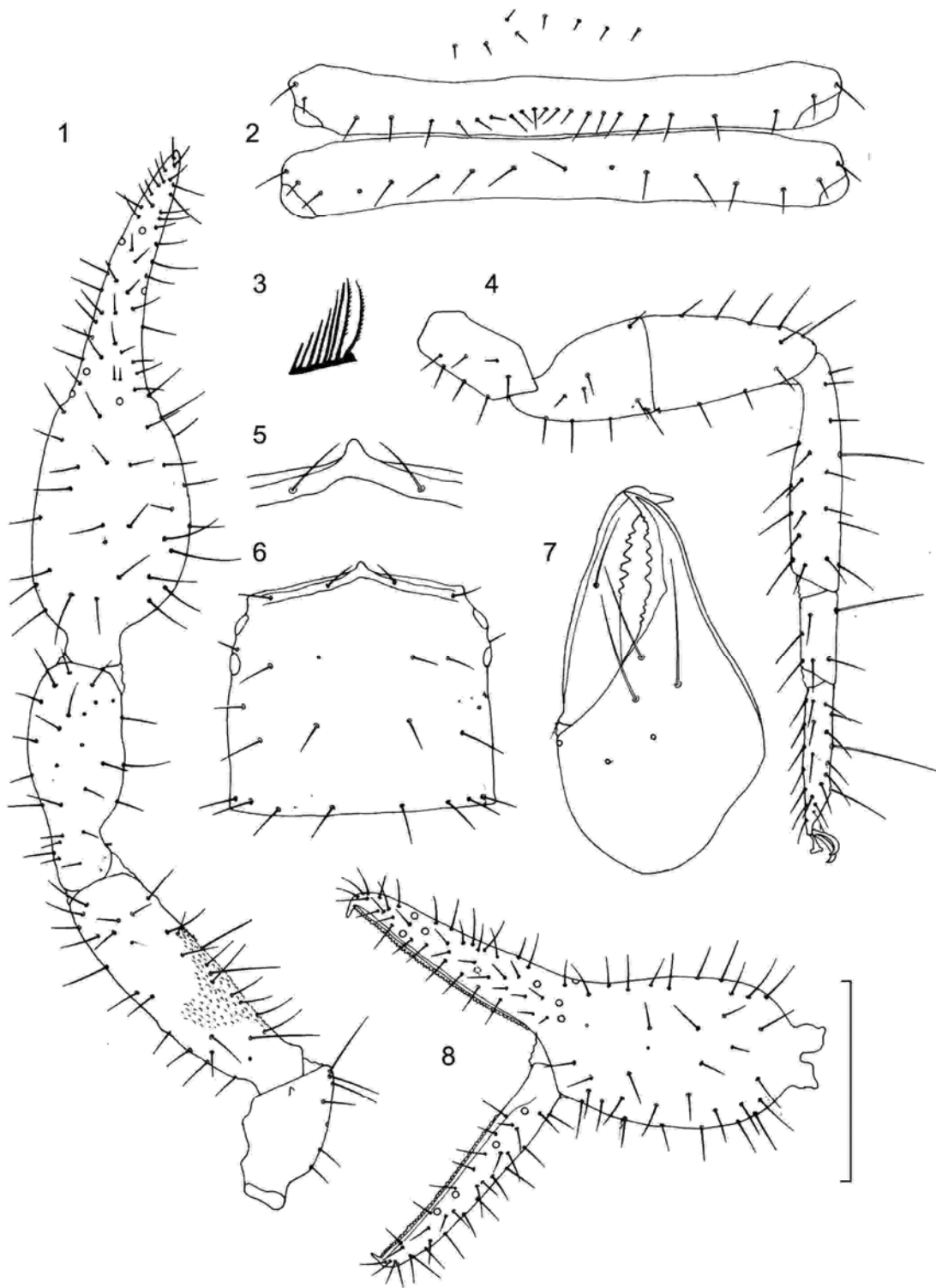
(Figs. 1-8; Table 1)

Etymology. – After Mons Agel (France), its type locality.

Material examined. – Holotype male, from the slopes of Mons Agel, 9 November 2008, Alpes Maritimes, France, collected by J.-M. Lemaire.

Description. – Carapace as long as broad (Fig. 6; Table 1), reticulate throughout. Epistome small, triangular, and apically rounded (Fig. 5). Four eyes developed, posteriors slightly smaller than anteriors (Fig. 6). No preocular microsetae developed. Carapacial setal formula: 4 + 6 + 6 + 8 = 24.

Abdominal tergites and sternites IV-X smooth, entire, and uniseriate. Setal formula of tergites I-X: 6-8-12-12-12-11-11-11-10-9. Male genital area: unknown. Female genital area (Fig. 2): sternite II with eight small median and posterior setae; sternite III with 19 posterior setae and two small setae along each of the stigma; sternite IV with 11 posterior setae and two or three suprastigmal microsetae along each stigma. Sternites V-X with 14-14-17-15-13-13 posterior setae each. Twelfth abdominal segment with two pairs of small setae. Pleural membranes granulostriate.



Figs. 1-8.

Galea of a low hyaline convexity (Fig. 7). Fixed cheliceral finger with six setae, movable finger with one seta (Fig. 7); galeal seta inserted just below the level of large teeth on the movable cheliceral finger. Fixed cheliceral finger with 11 triangular teeth which are gradually replaced by lower, smaller, close-set teeth. Movable cheliceral finger with seven distal teeth and four or five elevations which diminish basally (Fig. 7). Flagellum eight-bladed; only two distal blades are pinnate along their anterior margins. Other flagellar blades smooth and acuminate, decreasing from distal to proximal (Fig. 3); the two or three proximalmost blades are the smallest.

Apex of pedipalpal coxa (manducatory process) with five long and acuminate setae. Pedipalpal trochanter with two small tubercles, chelal palm slenderly ovate. Chelal finger slightly longer than chelal palm. Pedipalpal femur with interior and dorsal granulations (Fig. 1), other articles smooth; femur longer than chelal finger (Table 1). Fixed chelal finger with 63 small teeth which are triangular, pointed, retroconical and contiguous, not reaching the level of *ib* (Fig. 8). Movable chelal finger with 49 small and contiguous teeth which do not reach the level of *b*; the teeth are gradually replaced by rounded teeth and eventually by smaller, narrower, triangular and pointed teeth which reach as far as the level of *b-sb* (Fig. 8).

Disposition of trichobothria (Fig. 8): *eb*, *esb*, *ib*, and *isb* on the base of the finger; *et*, *it*, and *est* on proximal finger half, *ist* somewhat closer to *est* than to *ib*. Seta *sb* closer to *b* than to *st*, *st* closer to *t* than to *sb*. Distance *b-sb* longer than *t-st*. Distance *sb-st* less than twice as long as *b-sb* and more than twice as long as *b-sb* (Fig. 8).

Anterior and median rim of coxa I with few chitinous and transparent points. Pedal tactile setae: tibia with one elongated sensitive seta, basitarsus IV with one long seta, and tarsus IV with a single sensitive seta (Fig. 4). Subterminal tarsal setae furcate, each branch with few spinnules.

Morphometric ratios and linear measurements are presented in Table 1.

Diagnosis. – The new species (*N. montisageli* n. sp.) is easily distinguished from all *Neobisium* species known to date from France (Heurtault, 1985). From its phenetically closest congeners it is easily recognized by its trichobothriotaxy, pedipalpal granulations, the form of the pedipalpal articles, and many morphometric measurements and ratios (Figs. 1 and 8; Table 1). It is probably phenetically close to some congeners inhabiting epigean habitats in Monaco and/or Italy.

Distribution. – Mons Agel, Maritime Alps, France, epigean. Possibly distributed in Monaco and the adjoining Italian regions.

Remarks. – This is probably an endemic and relict pseudoscorpion species. The presence of granulations on its pedipalpal femur points either to its closeness to some Serbian (*N. fuscimanum* C. L. Koch), Bulgarian, and Turkish species of the genus or to the possibility of the original parallelism in the occurrence of the characteristics mentioned (Ćurčić, 1977).

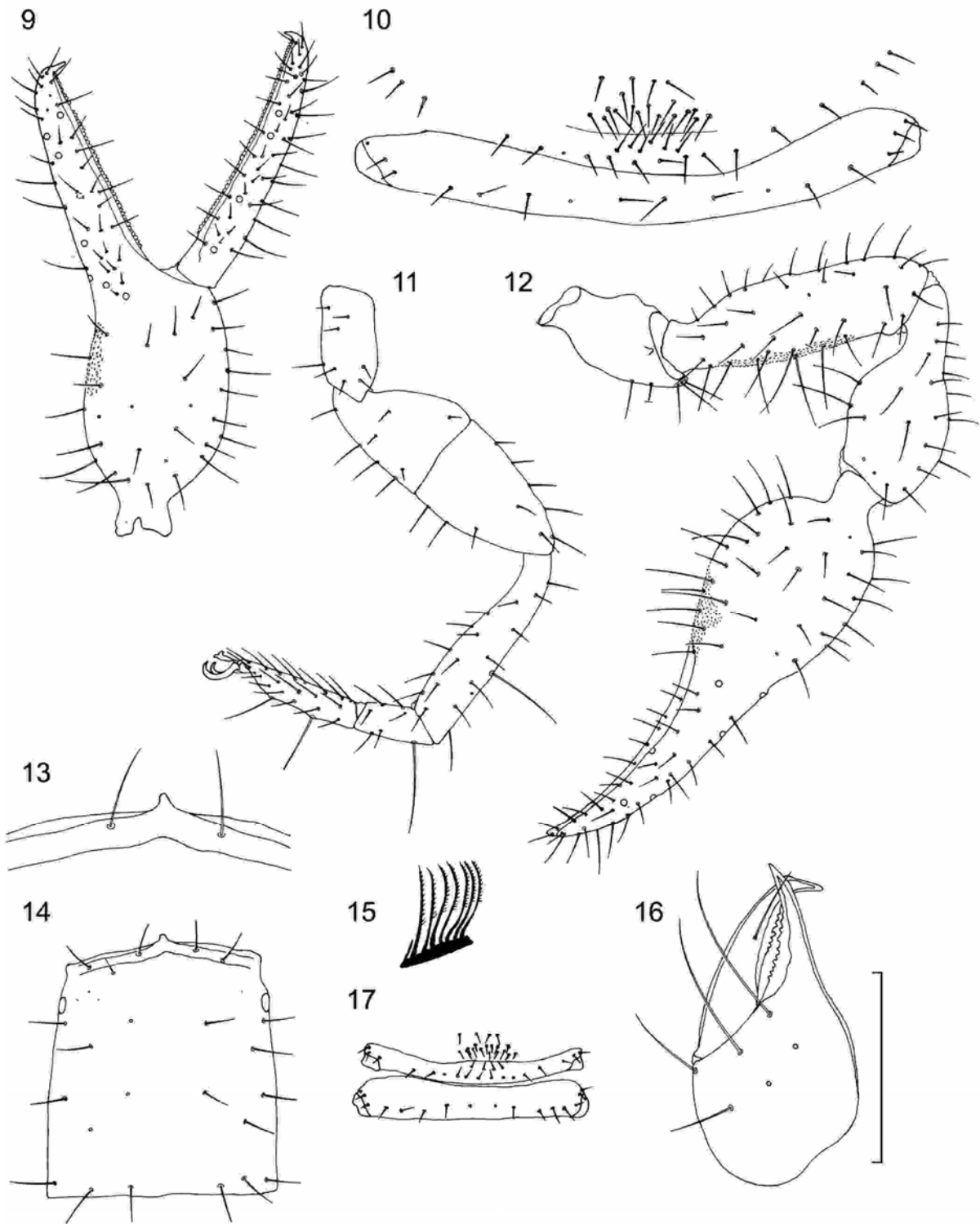
RONCUS PEISSENSIS, NEW SPECIES

(FIGS. 9-17; TABLE 1)

Etymology. – After Peisse (France), its type locality.

Material examined. – Holotype male, from Peisse, Maritime Alps, France, 9 November 2008, collected by J.-M. Lemaire.

Description. – Carapace longer than broad (Fig. 9; Table 1). Anterior carapacial margin only slightly convex (Fig. 13); epistome small and apically rounded. A pair of small eyes present (Fig. 14). Carapace reticulate throughout. Setal formulae: $5 + 6 + 6 + 6 = 23$ and $4 + 6 + 6 + 5 = 21$. The general setal formula is probably $4 + 6 + 6 + 6 = 22$. No preocular setae exist (Fig. 14).



Figs. 9-17.

Abdominal tergites and sternites IV-X smooth, entire and uniseriate. Tergal setation: 6-8-11-10-10-10-10-10-10 and 6-9-10-10-10-10-10-10-10. Male genital area: sternite II with 16 or 19 median and posterior setae; sternite III with four or five anterior setae, 10 or 12 posterior setae, and three suprastigmal microsetae on either side (Fig. 17); sternite IV with 10 or 11 setae and three small setae along each of the stigma (Figs. 10 and 17). Sternites V-X with 14-14-15-15-15-12 and 14-14-13-14-13-12 setae. Female genital area: unknown. Twelfth abdominal segment with two pairs of small setae. Pleural membranes granulostriate.

Galea of an inconspicuous elevation of the finger margin (Fig. 16). Cheliceral palm with six setae, movable finger with one seta; galeal seta inserted at the level of the largest teeth of the movable cheliceral finger (Fig. 16). Fixed cheliceral finger with 10-12 small distal and apically rounded teeth, which are followed by some tiny interspaced teeth which diminish in size proximally. Movable cheliceral finger with seven or eight small distal and rounded teeth which decrease in size from distal to proximal (Fig. 16). Flagellum of eight blades; seven distal blades of almost equal size and one small blade proximally. All flagellar blades are pinnate along their anterior margins (Fig. 15).

Manducatory process with four long and acuminate setae. Trochanter with a small tubercle, pedipalpal articles slightly elongated. Pedipalpal femur granulated interiorly and laterally, with a single exterior and lateral tubercle (Fig. 12). Chelal palm ovate (dorsal view), chelal fingers slender. Fixed chelal finger with 53-60 small, contiguous, and asymmetrically pointed teeth, reaching as far as the level of *ib*; only a few proximal teeth are somewhat rounded. Movable chelal finger with 52-55 teeth; only a few distal teeth are asymmetrically pointed, and these are gradually replaced by lower, close-set, square-topped or rounded teeth which reach the level of *b*. Chelal finger longer than chelal palm (Table 1); pedipalpal femur only slightly longer than chelal fingers.

Table 1. Linear measurements (in millimeters) and morphometric ratios in *Neobisium montisageli* n. sp., and *Roncus peissei* n. sp., from France. Abbreviations: F = female, MM = males.

Character	<i>N. montisageli</i> n. sp. (F)	<i>R. peissei</i> n. sp.
Body		
Length (1)	2.65	2.44-2.605
Cephalothorax		
Length (2)	0.62	0.67-0.71
Breadth (2a)	0.62	1.12-1.14
Ratio 2/2a	1.00	1.77-1.895
Abdomen		
Length	2.03	1.77-1.895
Chelicerae		
Length (3)	0.47	0.42-0.43
Breadth (4)	0.25	0.22-0.23
Length of movable finger (5)	0.305	0.285
Ratio 3/5	1.54	1.47-1.51
Ratio 3/4	1.88	1.87-1.91
Pedipalps		
Length with coxa (6)	3.59	3.53-3.545
Ratio 6/1	1.35	1.355-1.45
Length of coxa	0.52	0.51-0.53
Length of trochanter	0.42	0.44
Length of femur (7)	0.78	0.70-0.72
Breadth of femur (8)	0.19	0.20-0.21
Ratio 7/8	4.105	3.33-3.60
Ratio 7/2	1.26	1.03-1.07
Length of patella (tibia) (9)	0.60	0.55-0.58
Breadth of patella (tibia) (10)	0.24	0.25-0.26
Ratio 9/10	2.50	2.115-2.32
Length of chela (11)	1.27	1.28-1.33
Breadth of chela (12)	0.37	0.33-0.37
Ratio 11/12	3.43	3.46-4.03
Length of chelal palm (13)	0.62	0.60-0.63
Ratio 13/12	1.675	1.62-1.91
Length of chelal finger (14)	0.65	0.68-0.70
Ratio 14/13	1.05	1.11-1.13
Leg IV		
Total length	2.595	2.435-2.485
Length of coxa	0.36	0.35-0.37
Length of trochanter (15)	0.295	0.305-0.315
Breadth of trochanter (16)	0.14	0.14-0.15
Ratio 15/16	2.11	2.10-2.18
Length of femur + patella (17)	0.77	0.68-0.69
Breadth of femur + patella (18)	0.23	0.23-0.24
Ratio 17/18	3.35	2.875-2.96
Length of tibia (19)	0.57	0.56-0.57
Breadth of tibia (20)	0.12	0.11
Ratio 19/20	4.75	5.09-5.36
Length of metatarsus (21)	0.21	0.20-0.21
Breadth of metatarsus (22)	0.09	0.08
Ratio 21/22	2.33	2.50-2.625
Length of tarsus (23)	0.39	0.33-0.34
Breadth of tarsus (24)	0.08	0.07
Ratio 23/24	4.875	4.71-4.86
TS ratio - tibia IV	0.43	0.53-0.59
TS ratio - metatarsus IV	0.19	0.19-0.20
TS ratio - tarsus IV	0.37	0.30-0.33

Trichobothriotaxy: *eb*, *esb*, *ib*, and *isb* on the base of the finger, *esb* slightly basal to *eb*; *it* equidistant from *et* and *est*. Seta *ist* slightly closer to *est* than to *isb*. Seta *ist* closer to *ib* than to the finger tip. Setae *b* and *sb* inserted in the proximal and *st* and *t* in the distal finger half (Fig. 9). Distance *sb-st* somewhat longer than *b-sb*, and almost 1.5 times as long as *t-st*.

Coxa I: anterior and median rim with few chitinous points. Trochanteral foramen small. Pedal tactile setae: tibia IV, basitarsus IV, and telotarsus IV each with a single tactile seta. Subterminal tarsal setae furcate, each branch with a few spinules.

Morphometric ratios and measurements as in Table 1.

Diagnosis. – The newly discovered species, *Roncus peissei* n. sp., clearly differs from its congener *R. drescoi* Heurtault, 1985 in the shape and granulation of the pedipalpal articles, the disposition of trichobothria and in many morphometric measurements and ratios (Heurtault, 1985).

With regard to a single diagnostic characteristic – presence/absence of microsetae (proximal to *eb* and *esb*) – it should be noted that this feature is present in *R. lubricus* L. Koch, and virtually absent in *R. pannonius* Čurčić, Dimitrijević, and Karamata, 1992. However, these setae are probably missing in *R. peissei* n. sp., since a single microseta is present but only between *eb* and *esb*, and not proximal to these trichobothria (Čurčić, 1992a, 1992b; Čurčić et al., 1992, 1993). It is possible that the presence or absence of this characteristic may be useful in distinguishing between representatives of the two species' groups which we designated elsewhere as "West-European" (*R. lubricus*) and "East-European" (*R. pannonius*). The taxonomic position of *R. peissei* n. sp. is probably an intermediary one, hence further studies on the French *Roncus* species are inevitable.

Distribution. – Peisse, Maritime Alps, France, epigean. One of us (JML) collected the species of Neobisiidae, which is new to science; it was found

in the Maritime Alps, north of Monaco and was collected from under stones and leaf-litter.

Remarks. – The pseudoscorpions in France, both cave-dwelling and epigean, are scarcely known (Harvey, 1990). This is particularly due to the fact that they have been neglected during faunistic studies, and that pseudoscorpionologists in France are diminishing in number in an exponential manner. Moreover, the names of a number of these arachnids are synonyms.

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