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New and little-known pseudoscorpions of the genus *Roncus* L. Koch (Neobisiidae, Pseudoscorpiones) from Serbia, Yugoslavia

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Abstract

Two new species of *Roncus* L. Koch, 1873 (*R. svarozici* n. sp. and *R. svanteviti* n. sp.), collected in eastern and southeastern Serbia, Yugoslavia, are described and their distribution is given. A supplementary description of *R. pljakici* Ćurčić, 1973, is provided as well.

The taxonomic diversity of the western and southern European "*Roncus lubricus*" species complex is discussed in view of the importance of some diagnostic characters. The possible role of *R. svarozici* n. sp. and *R. parablothroides* Hadži, 1937 in colonizing caves is considered as well as the divergent differentiation of some Balkan subterranean pseudoscorpions.

Résumé

Deux nouvelles espèces du genre *Roncus* L. Koch, 1873 (*R. svarozici* n. sp. et *R. svanteviti* n. sp.), recueillies dans l'est et le sud-est de la Serbie, Yougoslavie, sont décrites et leur répartition est présentée. Une description supplémentaire de *R. pljakici* Ćurčić, 1973 est aussie fournie.

La diversité taxonomique du "*Roncus lubricus*"-complexe d'espèces d'Europe de l'est et du sud est discutée au point de vue de l'importance de certains caractères diagnostiques. Le rôle possible de *R. svarozici* n. sp. et de *R. parablothroides* Hadži, 1937, dans la colonisation des grottes est traité de même que la différentiation divergente de certains pseudoscorpions cavernicoles des Balkans.

Introduction

The pseudoscorpion genus *Roncus* L. Koch, 1873, is characterized by high diversity, especially in southern Europe, where it is most widespread on the Apennine and Balkan peninsulas (Ćurčić, 1973, 1981, 1982; Gardini & Rizzerio, 1986). Its distribution area stretches from the western regions of Europe as far as southwestern Asia.

Seven species of this genus are presently known to inhabit eastern Serbia (Yugoslavia). One of these, *R.* aff. *lubricus* L. Koch, 1873, is widely distributed in epigean habitats, but sometimes it occurs also in caves (Ćurčić, 1991). The endemic species *R. pljakici* Curčić, 1973, inhabits a cave on Mt. Stara Planina (= Mt. Balkan), while *R. remesianensis* Ćurčić, 1981, and *R. timacensis* Ćurčić, 1981, live underground on Mt. Belava and on the Svrljiške Planine mountains (Ćurčić, 1981). In addition, *R. parablothroides* Hadži, 1937, inhabits some caves on the northwestern slopes of Mt. Stara Planina, while *R. sotirovi* Ćurčić, 1982, lives in a few caves on the Mumulj Kamen and Greben Mountains. *R. bauk* Ćurčić, 1991, populates a cave on Mt. Kale in southeastern Serbia (Ćurčić, 1991).

The Serbian species of *Roncus* have not been sufficiently studied; the same holds true for other parts of the Balkan peninsula, except for the Dinaric Karst (Ćurčić, 1974, 1988). However, it is evident that divergent differentiation of cavernicolous *Roncus* has taken place in almost all areas of the peninsula (Hadži, 1937; Von Helversen, 1969; Ćurčić & Beron, 1981).

In the present study, material of three samples of pseudoscorpions, collected in eastern Serbia in 1989 and 1990, is examined. Specimens studied from a sample from beech leaf-litter and humus in the village of Jelovica, near Pirot, belong to a new taxon:

R. svarozici n. sp. The sample from a cave in the village of Novo Korito, near Minićevo, also provided a previously undescribed species, *R. svanteviti* n. sp. The third lot includes two topotypes (one of each sex) of the troglobitic *R. pljakici* Ćurčić, 1973, which is otherwise known from the holotype and two paratype specimens only.

Thus the total number of species of the genus *Roncus* in Serbia known to date has risen to nine. The two newly described species are probably endemic and relict forms, inhabiting the eastern and southeastern areas of the republic.

Descriptive part

Roncus svarozici n. sp.
(Figs. 1–8, 19)

Specimens examined. – Holotype ♂, allotype ♀, and 2 paratype ♂♂, from beach leaf-litter and humus, in front of the "Pećina u selu Vrelo" Cave, village of Jelovica, near Pirot, southeastern Serbia (Yugoslavia), 15 July 1989, B.P.M. Ćurčić and L.R. Lučić leg.; 2 paratype ♂♂ and 1 paratype ♀ from the same locality, 11 July 1990, B.P.M. Ćurčić, L.R. Lučić and O.S. Karamata leg.). The type specimens have been deposited in the Institute of Zoology, Faculty of Science, University of Belgrade, Belgrade.

Description. – Epistome small, triangular and pointed (or slightly rounded apically; Fig. 1). Carapace somewhat longer than broad (Table I). One small eye on each carapace side (tapetum still visible). Setal formulae: 4+6+2+4+2+6=24 (male), 4+6+2+4+2+6=24 or 4+7+2+4+2+6=25 (female). Carapace reticulate; preocular microsetae not developed.

Abdominal tergites I–X and sternites IV–X entire, smooth and uniseriate. Tergites I–X setation: 6-10-10-11-11-12-10-12-11-10, or 6-9-10-10-10-11-10-11-10-10, 6-9-10-11-10-11-9-9-10-10, 6-9-11-10-9-10-11-10-10-10, 6-7-11-11-11-12-11-11-10-10 (male), and 6-7-11-11-11-11-9-10-10-10 or 6-10-11-11-11-10-10-11-10-10 (female).

Male genital area: sternite II with 17–24 setae (7–14 of these grouped medially and 8–10 setae distributed along posterior sternal margin). Sternite III with 4 or 5 anterior setae, 10–12 posterior setae, and 3 setae along each stigma. Sternite IV with 9–15 setae and 2 or 3 suprastigmal microsetae on either side.

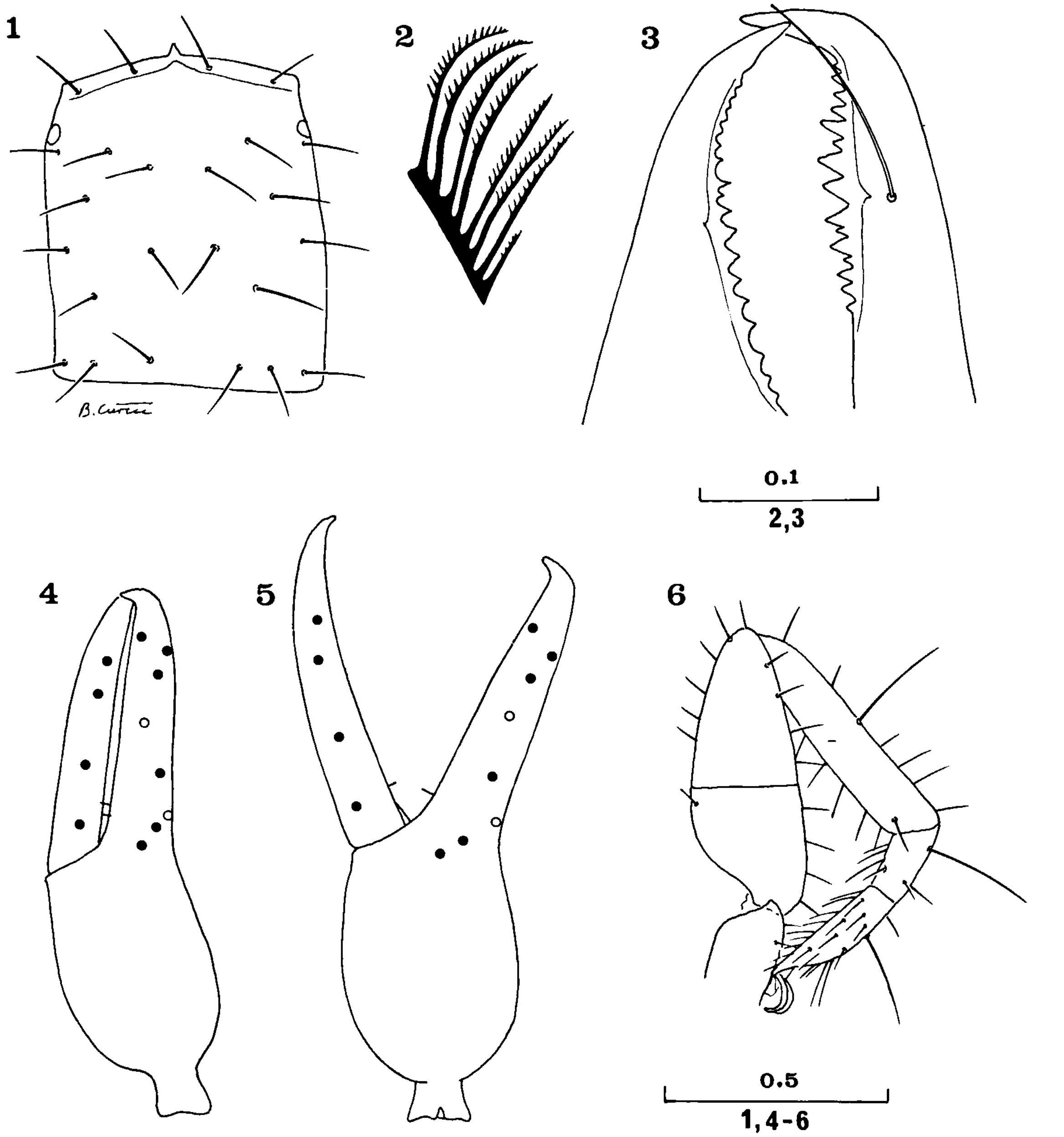
Female genital area: sternite II with 11 small posterior and median setae in the form of a triangle. Sternite III with 12 posterior and median setae and 3 small setae along each stigma. Sternite IV with 9 or 10 marginal setae and 3 suprastigmal microsetae on either side.

Sternites V–X with 13-13-13-13-12-12, 14-15-15-14-13-13, 12-14-13-13-14-13, 15-14-13-14-13-13, and 11-14-14-13-13-13 (male), and 15-13-13-12-12-12 and 13-14-14-14-14-13 setae (female). Twelfth abdominal segment with two pairs of small setae. Pleural membranes granulostriate.

Cheliceral spinneret almost absent (Fig. 3). Cheliceral palm with 6 setae in the male and 6 or 7 setae in the female; movable finger with one seta. Fixed cheliceral finger with 21–23 small teeth, diminishing in size both distally and proximally. Distal teeth of unequal form; proximal members triangular and slightly interspaced. Movable cheliceral finger with 12–16 teeth; of these, 3 or 4 distal teeth are small, followed by some higher and triangular teeth which gradually become lower. The largest teeth on the movable cheliceral finger are developed slightly distal to *gl* (= galeal seta; all other abbreviations of setal names according to Beier, 1963). Flagellum of 8 blades, pinnate along their anterior margins (Fig. 2).

Manducatory process with 4 long setae. Pedipalpal articles moderately elongate, trochanter with a small tubercle. Pedipalpal femur and chelal palm inconspicuously granulated on interior and lateral sides (Figs. 7, 8). Other pedipalpal articles smooth. Fixed chelal finger with 58–61 (male) or 55–60 teeth (female); distal teeth pointed and asymmetrical, succeeded by small, closely-set and retroconical teeth reaching level of *ib*. Movable chelal finger with 57–63 (male) or 56–59 teeth (female); distal teeth pointed and retroconical, giving way to rounded or square-cusped teeth which stretch as far as the level of *ib*. Chelal fingers longer than chelal palm and only slightly shorter than (or equal to) pedipalpal femur. Pedipalpal femur in general as long as carapace (Table I). Tiny microsetae proximal to *eb* and *esb* not developed.

Trichobothriotaxy: *eb*, *esb*, *ib*, and *isb* on finger



Figs. 1–6. Roncus svarozici n. sp.: 1, carapace, allotype ♀; 2, flagellum, allotype ♀; 3, cheliceral fingers, allotype ♀; 4, pedipalpal chela, holotype ♂; 5, pedipalpal chela, paratype ♂ No. 1; 6, leg IV, paratype ♂ No. 3. Scales in mm.

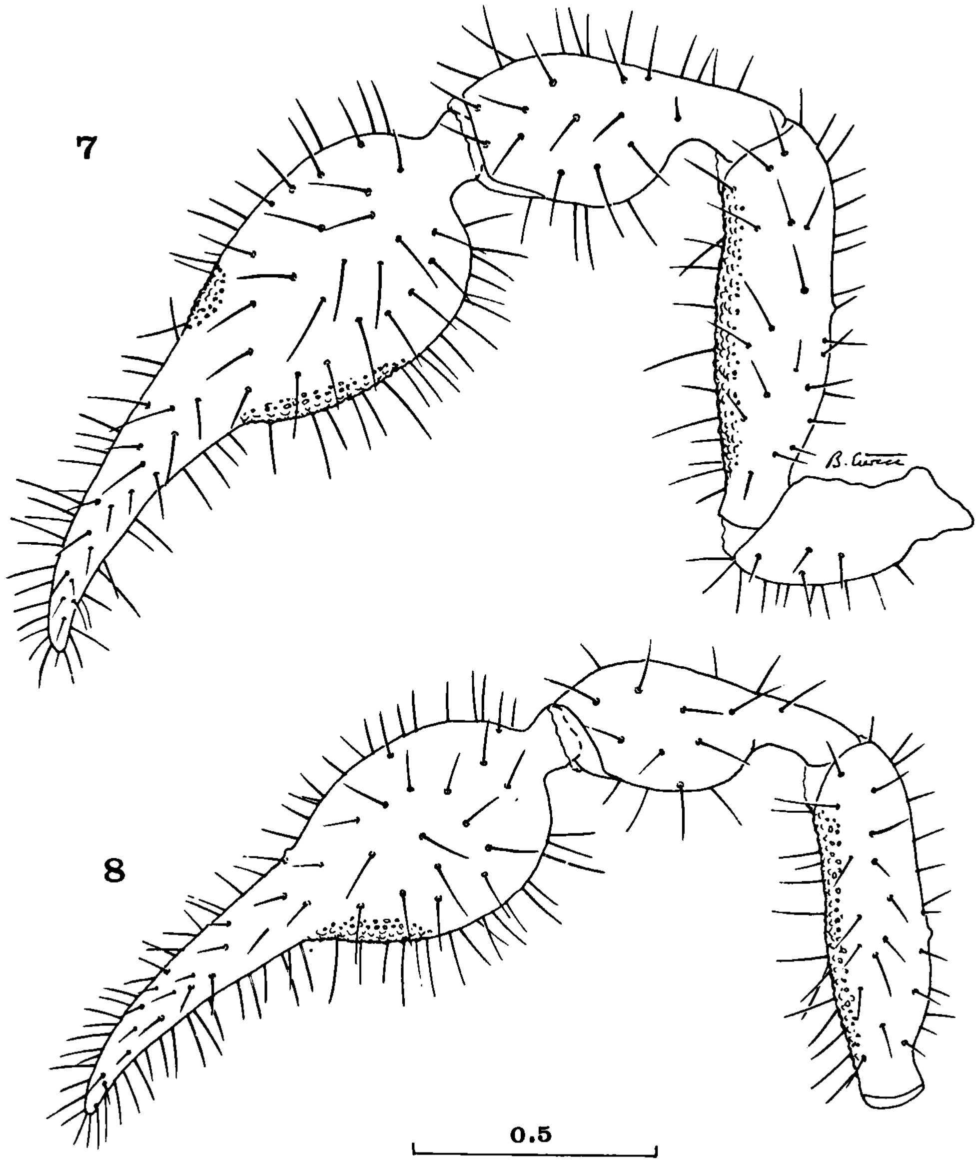
base; *it*, *et*, and *est* in proximal half of finger, *it* equidistant from *et* and *est* (or slightly closer to *est* than to *et*); *ist* equidistant from *est* and *isb* (or slightly closer to *est* than to *isb*). Seta *ist* closer to *ib* than to finger tip. Seta *sb* closer to *b* than to *st*, *st* closer to *t* than to *sb*. Disposition of different trichobothria as in Figs. 4 and 5.

Anterior and median angle of coxa I smooth or with 2 or 3 small, transparent chitinous points. Trochantic foramen small and pointed. Tibia IV, basitarsus IV, and telotarsus IV each with a single tactile seta (Fig. 6). Subterminal tarsal setae fur-

Table I. Range in measurements (mm) of various structures, together with selected ratios, in *Roncus svarozici* n. sp., *R. svanteviti* n. sp., and *R. pljakici* Ćurčić, 1973.

Character	*R. svarozici* ♀♀	*R. svarozici* ♂♂	*R. svanteviti* ♀♀	*R. svanteviti* ♂	*R. pljakici* ♀	*R. pljakici* ♂
BODY						
Length (1)	3.13 – 3.315	2.425 – 3.15	2.79 – 3.27	2.95	3.115	2.96
CEPHALOTHORAX						
Length (2)	0.775 – 0.80	0.68 – 0.75	0.87 – 0.93	0.84	0.92	0.90
Breadth	0.65 – 0.70	0.59 – 0.665	0.66 – 0.70	0.63	0.73	0.75
ABDOMEN						
Length	2.33 – 2.54	1.715 – 2.40	1.89 – 2.40	2.11	2.195	2.06
Breadth	1.17 – 1.23	0.89 – 0.99	0.89 – 1.10	0.96	1.07	1.10
CHELICERAE						
Length (3)	0.48 – 0.50	0.435 – 0.47	0.52 – 0.56	0.50	0.54	0.52
Breadth (4)	0.24 – 0.26	0.22 – 0.27	0.26 – 0.29	0.26	0.26	0.24
Length of movable finger (5)	0.33 – 0.35	0.305 – 0.34	0.36 – 0.39	0.36	0.38	0.35
Ratio 3/5	1.43 – 1.45	1.35 – 1.47	1.435 – 1.46	1.39	1.42	1.485
Ratio 3/4	1.92 – 2.00	1.74 – 2.09	1.93 – 2.00	1.92	2.08	2.17
Length of galea	0.01	0.005 – 0.01	0.005 – 0.01	–	0.01	0.01
PEDIPALPS						
Length with coxa (6)	3.97 – 3.985	3.62 – 3.85	4.46 – 4.86	4.495	5.14	4.96
Ratio 6/1	1.20 – 1.27	1.20 – 1.575	1.36 – 1.74	1.52	1.65	1.675
Length of coxa	0.58	0.56 – 0.61	0.60 – 0.67	0.63	0.68	0.66
Length of trochanter	0.49 – 0.50	0.44 – 0.48	0.56 – 0.58	0.535	0.64	0.61
Length of femur (7)	0.78 – 0.79	0.73 – 0.79	0.95 – 1.01	0.93	1.07	1.035
Breadth of femur (8)	0.25	0.21 – 0.23	0.23 – 0.25	0.22	0.25	0.23
Ratio 7/8	3.12 – 3.16	3.22 – 3.48	3.96 – 4.13	4.23	4.28	4.50
Ratio 7/2	0.99 – 1.01	0.99 – 1.08	1.09 – 1.10	1.11	1.16	1.15
Length of tibia (9)	0.66 – 0.67	0.60 – 0.65	0.75 – 0.82	0.76	0.87	0.89
Breadth of tibia (10)	0.30 – 0.32	0.26 – 0.29	0.32 – 0.35	0.30	0.33	0.31
Ratio 9/10	2.06 – 2.23	2.14 – 2.31	2.34 – 2.38	2.53	2.64	2.87
Length of chela (11)	1.44 – 1.465	1.29 – 1.40	1.60 – 1.80	1.64	1.88	1.765
Breadth of chela (12)	0.44 – 0.45	0.38 – 0.41	0.46 – 0.50	0.41	0.46	0.43
Ratio 11/12	3.20 – 3.33	3.32 – 3.50	3.48 – 3.83	4.00	4.09	4.10
Length of chelal palm (13)	0.69	0.59 – 0.69	0.79 – 0.88	0.76	0.88	0.775
Ratio 13/12	1.53 – 1.57	1.51 – 1.625	1.72 – 1.87	1.85	1.91	1.80
Length of chelal finger (14)	0.75 – 0.775	0.70 – 0.75	0.81 – 0.92	0.88	1.00	0.99
Ratio 14/13	1.09 – 1.12	1.14 – 1.20	1.02 – 1.045	1.16	1.14	1.28
LEG IV						
Total length	2.695 – 2.78	2.34 – 2.635	3.005 – 3.17	3.01	3.325	3.065
Length of coxa	0.425	0.35 – 0.41	0.425 – 0.48	0.44	0.49	0.47
Length of trochanter (15)	0.34 – 0.36	0.30 – 0.33	0.37 – 0.40	0.35	0.41	0.40
Breadth of trochanter (16)	0.15 – 0.16	0.14 – 0.15	0.14 – 0.15	0.15	–	0.175
Ratio 15/16	2.25 – 2.27	2.10 – 2.285	2.60 – 2.67	2.33	–	2.285
Length of femur (17)	0.72	0.65 – 0.70	0.80 – 0.84	0.775	0.89	0.81
Breadth of femur (18)	0.25 – 0.26	0.23 – 0.27	0.26 – 0.27	0.26	0.25	0.21
Ratio 17/18	2.77 – 2.88	2.555 – 2.92	3.07 – 3.23	2.98	3.56	4.00
Length of tibia (19)	0.64 – 0.675	0.52 – 0.63	0.76 – 0.82	0.75	0.795	0.665
Breadth of tibia (20)	0.12	0.10 – 0.13	0.13 – 0.14	0.14	0.135	0.13
Ratio 19/20	5.33 – 5.625	4.73 – 6.20	5.85 – 6.08	5.36	5.89	5.115
Length of basitarsus (21)	0.23 – 0.24	0.20 – 0.23	0.25 – 0.26	0.2	0.27	0.25
Breadth of basitarsus (22)	0.09 – 0.10	0.08 – 0.09	0.10 – 0.11	0.10	0.11	0.09
Ratio 21/22	2.40 – 2.555	2.44 – 2.555	2.36 – 2.60	2.60	2.45	2.78
Length of telotarsus (23)	0.34 – 0.36	0.32 – 0.36	0.40 – 0.44	0.435	0.47	0.44
Breadth of telotarsus (24)	0.09	0.075 – 0.09	0.085 – 0.10	0.09	0.11	0.09
Ratio 23/24	3.78 – 4.00	4.00 – 4.27	4.10 – 4.705	4.83	4.27	4.89
TS-ratio tibia IV	0.56 – 0.57	0.54 – 0.60	0.58 – 0.59	0.58	0.655	0.55
TS-ratio basitarsus IV	0.205 – 0.21	0.17 – 0.275	0.19 – 0.21	0.18	0.25	0.25
TS-ratio telotarsus IV	0.34	0.30 – 0.38	0.37 – 0.38	0.38	0.42	0.41

Abbreviation: TS-ratio = tactile seta ratio.



Figs. 7–8. Roncus svarozici n. sp.: 7, pedipalp, allotype ♀ (trichobothria omitted); 8, pedipalp, holotype ♂ (trichobothria omitted). Scale in mm.

cate, each branch with few spinules.

Morphometric ratios and linear measurements are presented in Table I.

Distribution. – Southeastern Serbia (Yugoslavia), epigean (under stones, and in humus and leaf-litter). Probably endemic to the Balkan peninsula (Fig. 19).

Remarks. – From the geographically nearest species, *R. pljakici* which inhabits the "Pećina u selu Vrelo" Cave, at a distance of less than 15 m, *R. svarozici* n. sp. is easily distinguished by the presence of small eyes, the setation of the anterior abdominal tergites (fewer setae in *R. pljakici*, more in *R. svarozici*), the form of the pedipalpal articles (slender in *R. pljakici*, stout in *R. svarozici*), the less granulated appendages, the smaller number of teeth on the pedipalpal chelae, the disposition of the trichobothria, and by some linear measurements and morphometric ratios (e.g., in *R. svarozici* pedipalpal length is 3.62–3.985 mm vs. 4.495–5.755 mm in *R. pljakici*, pedipalpal femur length is 0.73–0.79 mm vs. 0.93–1.21 mm, and pedipalpal femur length/breadth is 3.12–3.48 mm vs. 4.23–4.65 mm, respectively; Table I) (see also Ćurčić, 1973). In addition, the two species differ in body size (*R. pljakici* is larger) as well as in their habitats (epigean vs. cavernicolous).

The new species *R. svarozici* differs from *R. lubricus* as redescribed by Gardini (1983) in the shape of the galea (small in *R. lubricus*, almost lacking in *R. svarozici*), the shape of the pedipalpal articles and especially of the pedipalpal chelae (more slender in *R. lubricus* than in *R. svarozici*), the trichobothrial pattern, the number of teeth on the pedipalpal chelae (more in *R. lubricus* than in *R. svarozici*), and in some linear measurements (Table I) (e.g., in *R. lubricus* carapace length is 0.56–0.66 mm vs. 0.68–0.80 mm in *R. svarozici*, pedipalpal tibia length is 0.45–0.57 mm vs. 0.60–0.67 mm, and pedipalpal chela length is 0.97–1.20 mm vs. 1.29–1.465 mm, respectively) (see also Gabbutt & Vachon, 1967).

However, perhaps the most important distinction between *R. lubricus* and *R. svarozici* is the presence, in *R. lubricus*, of a group of tiny setae proximal to *eb* and *esb*, and their virtual absence in *R. svarozici*. According to Gardini (1981), this patch of microsetae is also present in some *Roncus* species, but it may be completely absent in other members of the genus (Gardini & Rizzerio, 1986; Ćurčić, 1988). This distinction may well be one of the main features delimiting the species groups of *Roncus*, if further supported by additional evidence (e.g., in comparative morphology and biogeography).

Etymology. – After Svarožić, the name of the ancient Slavic fire god (Cotterell, 1986).

Roncus svanteviti n. sp.
(Figs. 9–19)

Specimens examined. – Holotype ♂, allotype ♀, and 2 paratype ♀♀, from the "Pećina u Kožuvarskoj Glami" Cave, village of Novo Korito near Minićevo (Knjaževac), eastern Serbia (Yugoslavia), 5 July 1990, collected together with two undescribed specimens of *Chthonius* C.L. Koch, 1843 (subgenus *Globochthonius* Beier, 1931), belonging to the pseudoscorpion family Chthoniidae; B.P.M. Ćurčić, O.S. Karamata, L.R. Lučić, and R.N. Dimitrijević leg. The type specimens have been deposited in the collection of the Institute of Zoology, Faculty of Science, University of Belgrade, Belgrade.

Description. – Carapace longer than broad (Table I). Epistome triangular and pointed (Figs. 9, 10). One small eye spot on each side of carapace. Preocular microsetae not developed. Carapace reticulate throughout.

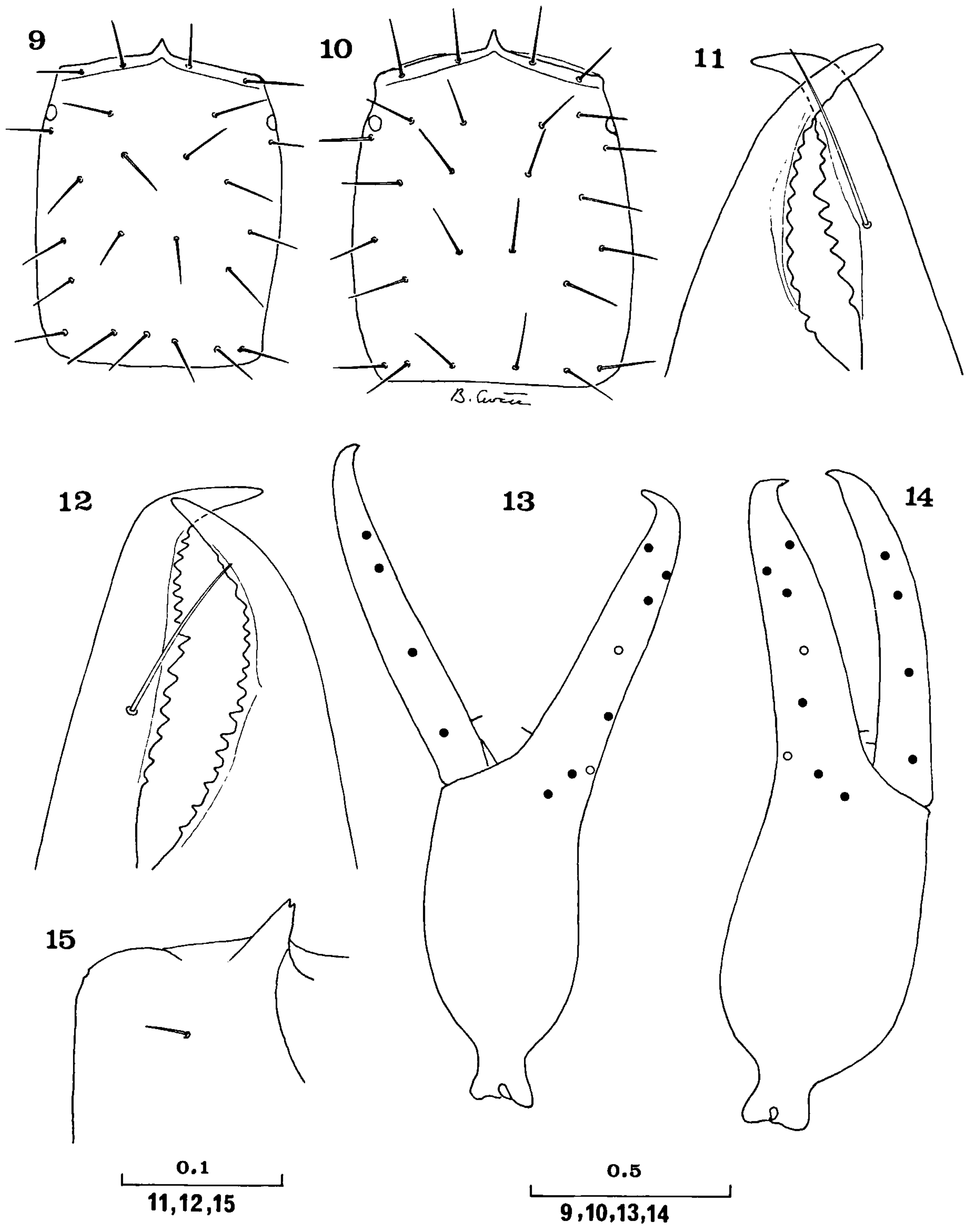
Cephalothoracic setae grouped into five rows: anterior, ocular, median, intermedian, and posterior. Anterior series with 4 setae, arranged uniformly along anterior margin of cephalothorax; 6 setae in ocular series; 5–10 setae present in combined median and intermedian series, and 6 setae on posterior cephalothoracic margin. Setal formulae: 4+6+5+6=21 (male), 4+6+8+6=24, 4+6+10+6=26, and 3+8+6+6=23 (female). The basic pattern is, probably, 4+6+8+6=24 setae.

Abdominal tergites uniseriate, smooth and entire. Tergite I with 6 setae; number of setae gradually increasing on more posterior tergites, with a maximum of 11 or 12 setae from tergite III onwards. Tergal formulae: 6-9-11-11-11-11-11-11-11-10 (male), 6-8-11-11-11-11-10-11-10-10, 6-8-11-10-11-11-11-10-11-10, and 6-8-10-10-12-11-10-12-11-11 (female).

Male genital area: sternite II with 16 posterior and median setae (of these, 8 setae grouped in the form of a triangle and 8 setae present on posterior sternal margin). Sternite III with 6 anterior setae, transverse row of 10 posterior setae, and 3 microsetae on each side. Sternite IV with 9 setae and 2 or 3 small setae along each stigmatic plate.

Female genital area: sternite II with 10–13 setae in the form of a triangle (or in the form of two barely distinguishable groups). Sternite III with 9–12 posterior setae and 3 microsetae along each stigma. Sternite IV with 12 or 13 setae and 2 or 3 small setae along each stigmatic plate.

Sternites V–X setation: 14-14-14-13-12-12 (male) and 14-14-13-14-13-13, 13-14-14-13-14-13, and 14-15-15-14-13-13 (female). Anal papilla with 2



Figs. 9–15. Roncus svanteviti n. sp.; 9, carapace, paratype ♂; 10, carapace, paratype ♀; 11, cheliceral fingers, holotype ♂; 12, cheliceral fingers, allotype ♀; 13, pedipalpal chela, holotype ♂; 14, pedipalpal chela, allotype ♀; 15, trochantic foramen of coxa I, allotype ♀. Scales in mm.

pairs of small setae. Pleural membranes granulostriate.

Cheliceral spinneret almost inconspicuous in both male and female (Figs. 11, 12). Cheliceral palm with 6 (male) and 6 or 7 setae (female). Movable cheliceral finger with a single seta. Fixed cheliceral finger with 18–22 closely-set and small teeth of unequal size and form, diminishing in size both distally and proximally (Figs. 11, 12). Proximal teeth on fixed cheliceral finger interspaced. Movable cheliceral finger with 12–15 teeth; distal teeth small and of unequal size and form, followed by some higher teeth; proximal teeth slightly interspaced. Largest teeth on movable cheliceral finger found distal to level of insertion site of *gl* (Figs. 11, 12). Flagellum eight-bladed, characteristic of the genus *Roncus*.

Manducatory process with 4 long and acuminate setae; trochanter with a small tubercle. Pedipalpal articles somewhat elongate (Figs. 16, 17); trochanter with some interior granulations (male) or smooth (female); femur with interior and dorsobasal granulations and one small exterior and lateral tubercle. Chelal palm with inconspicuous granulations on interior and exterior sides. Other pedipalpal articles smooth (Figs. 16, 17).

Fixed chelal finger with 71 (male) or 64–66 teeth (female); only distal teeth slightly asymmetrical and pointed; other teeth closely-set, small and retroconical, not reaching the level of *ib*. Movable chelal finger with 74 (male) or 59–64 teeth (female); distal teeth triangular and retroconical; other teeth rounded or square-cusped, reaching as far as the level of *b*. Chelal fingers slightly longer than chelal palm and shorter than pedipalpal femur. Pedipalpal femur somewhat shorter than carapace (Table I). Tiny microsetae proximal to *eb* and *esb* not developed.

Trichobothriotaxy: *eb*, *esb*, *ib*, and *isb* on finger base, *it*, *et*, and *est* in proximal half of finger. Seta *it* equidistant from *et* and *est*, *est* closer to *it* than to *et*. Seta *ist* equidistant from *est* and *isb* (or, slightly closer to *isb* than to *esb*). Seta *ist* closer to *ib* than to finger tip. Seta *sb* equidistant from *b* and *st*, *st* closer to *t* than to *sb*. Disposition of different trichobothria as in Figs. 13 and 14.

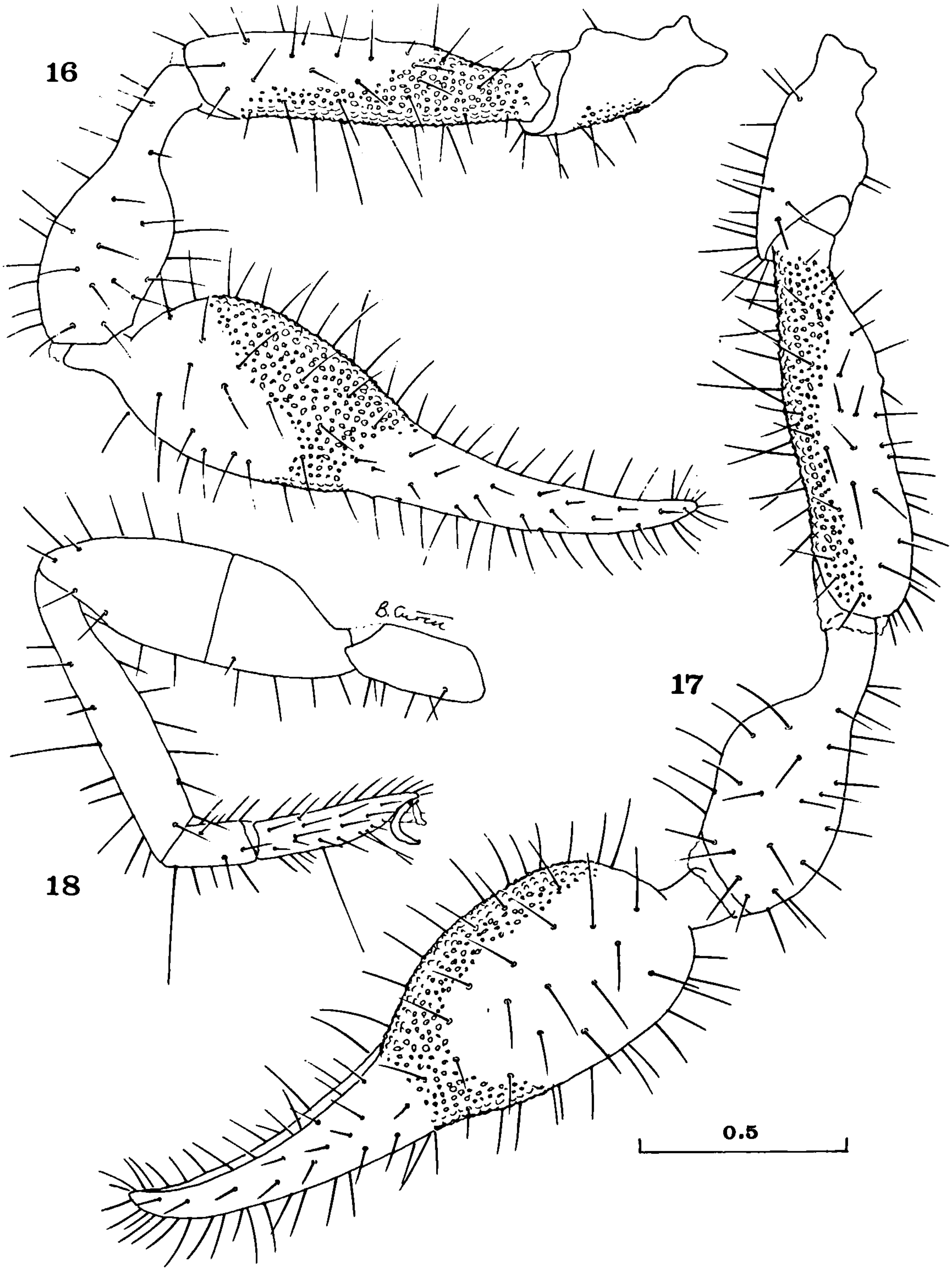
Anterior and median rim of coxa I smooth; trochantic foramen small and pointed (Fig. 15). Pedal tactile setae of leg IV (Fig. 18): tibia, basitarsus, and telotarsus each with a single tactile seta (tibial seta inserted distally, and basitarsal and telotarsal setae inserted proximally). Subterminal tarsal setae furcate, each branch with a few spinules.

Linear measurements and morphometric ratios are presented in Table I.

Distribution. – Southeastern Serbia (Yugoslavia), in caves (Fig. 19). Probably endemic and relict form.

Remarks. – The present new species and *R. svarozici* n. sp. show considerable differences in the number of teeth on the pedipalpal chelae (more in *R. svanteviti*, fewer in *R. svarozici*), the disposition of different trichobothria, the form of the pedipalpal articles (more slender in *R. svanteviti*, stouter in *R. svarozici*), the ratio of the length of pedipalpal femur and carapace (in *R. svarozici* the femur is in general as long as the carapace; in *R. svanteviti* it is somewhat shorter than the carapace), the granulation of the appendages (well developed in *R. svanteviti*, less conspicuous in *R. svarozici*), and in some morphometric ratios and linear measurements (Table I) (e.g., in *R. svanteviti* the pedipalpal length is 4.46–4.85 mm vs. 3.62–3.985 mm in *R. svarozici*; ratio of pedipalpal femur length/breadth is 3.96–4.23 in *R. svanteviti* vs. 3.12–3.48 in *R. svarozici*). The two species also differ in body size (*R. svanteviti* is larger), as well as in habitat preference (*R. svarozici* is epigean, and *R. svanteviti* is cave-dwelling).

R. svarozici n. sp. is easily distinguished from *R. lubricus* by the presence of eye spots in the former and of well-developed eyes in the latter species, by the number of teeth on the pedipalpal chelae (more in *R. svarozici*, fewer in *R. lubricus*), the disposition of different trichobothria, the form of the pedipalpal articles (more slender in *R. svanteviti*, stouter in *R. lubricus*), the granulation of the appendages (well developed in *R. svarozici*, less conspicuous in *R. lubricus*), and in some linear measurements (Table I) (e.g., carapace length in *R. lubricus* is 0.56–0.66 mm vs. 0.84–0.93 mm in *R. svarozici*, pedipalpal chela length is 0.97–1.20 mm



Figs. 16–18. Roncus svanteviti n. sp.: 16, pedipalp, holotype ♂ (trichobothria omitted); 17, pedipalp, paratype ♀ (trichobothria omitted); 18, leg IV, allotype ♀. Scale in mm.

vs. 1.64–1.80 mm, and pedipalpal femur length is 0.64–0.75 mm vs. 0.93–1.01 mm, respectively; see also Gabbutt & Vachon, 1967).

From the phenetically most similar species *R. parablothroides*, *R. svanteviti* n. sp. differs in the disposition of different trichobothria (in *R. svanteviti*, *ist* is equidistant from *isb* and *est*, and in *R. parablothroides*, *ist* is closer to *isb* than to *est*; in *R. svanteviti*, *sb* is equidistant from *b* and *st*, and in *R. parablothroides* it is closer to *b* than to *st*; see also Ćurčić, 1982), the shape of the chelal palm (elongated in *R. svanteviti*, ovate in *R. parablothroides*), and in the degree of granulation on the pedipalpal trochanter (inconspicuous tubercles or none in *R. svanteviti*, vs. well developed granulations in *R. parablothroides*).

Etymology. – In Slavic mythology, Svantevit is a four-headed war god (Cotterell, 1986).

Roncus pljakici Curčić, 1973
(Fig. 19)

Specimens examined. – Topotype ♂, from the "Pećina u selu Vrelo" Cave, village of Jelovica, 30 km east of Pirot and 19 km north of Dimitrovgrad, southeastern Serbia (Yugoslavia), 11 July 1990, B.P.M. Ćurčić leg.; topotype ♀, 15 July 1989, same collector and locality. The specimens have been deposited in the collection of the Institute of Zoology, Faculty of Science, University of Belgrade, Belgrade.

Redescription. – Carapace considerably longer than broad (Table I). Anterior margin of carapace with 4 setae; 6 setae along posterior margin. Setal formulae: $4+6+2+4+2+6=24$ (male) and $4+7+2+4+2+6=25$ (female). Neither eyes (eye spots), nor preocular microsetae present.

Abdominal sclerites uniseriate and smooth. Tergites I–X setation: 6-8-8-10-10-10-10-11-10-10 (male) and 6-8-11-11-11-10-10-10-10-10 (female).

Male genital area: sternite II with 14 setae arranged in form of a triangle (some setae placed medially and posteriorly, and the remainder along the posterior sternal margin). Sternite III with 4 anterior setae, 10 posterior setae, and 3 small microsetae along each stigma. Sternite IV with 10 posterior setae and 3 microsetae on either side.

Female genital area: sternite II with 10 posterior and median setae. Sternite III with 11 posterior setae and 3 suprastigmal microsetae on either side. Sternite IV with a series of 13 marginal setae and 3 microsetae along each of the stigmata.

Sternites V–X setation: 13-14-14-13-14-12 (male) and 13-14-13-12-14-13 (female). Anal papilla with 2 pairs of small setae. Pleural membranes granulostriate.

Galea low and flattened. Movable and fixed cheliceral fingers with 10–13 and 15–17 teeth, respectively. Fixed cheliceral finger with small, low and mostly pointed and triangular teeth; these diminish in size both proximally and distally. Movable cheliceral finger with small, closely-set and pointed teeth; 2 or 3 median teeth somewhat larger than others. Cheliceral flagellum eight-bladed. Six or seven setae occur on cheliceral palm and only one on movable finger.

Manducatory process with 4 long setae. Pedipalpal articles elongate; femur and tibia dilated distally. Femur with interior and lateral, and chelal palm with inconspicuous interior and distal granulations. Trochanter and tibia smooth, femur with a small exterior tubercle. Chelal fingers slightly longer than chelal palm. Pedipalpal femur longer than carapace, chelal fingers slightly longer than carapace (Table I).

Movable finger of pedipalpal chela with 71 (male) or 72 teeth (female); 72–74 teeth present in both male and female on fixed chelal finger. Distal pointed teeth on movable finger succeeded by teeth with rounded tops and eventually by shorter, flattened teeth. On fixed finger, first few teeth pointed, slightly asymmetrical; other teeth square-cusped. Tiny microsetae proximal to *eb* and *esb* not developed.

Trichobothriotaxy: *eb*, *esb*, *ib*, and *isb* on base of finger; *esb* distal to *eb*; *it*, *et*, *est*, and *ist* in distal half of finger; *ist* closer to *est* than to *isb*; *it* equidistant from *et* and *est* (or slightly closer to *est* than to *et*; *ib* closer to *esb* than to *isb*. Seta *sb* closer to *b* than to *st*, *st* closer to *t* than to *sb*; distance *b-sb* somewhat shorter than (or equal to) distance *sb-st*, distance *t-st* shorter than either *sb-st* or *b-sb*.

Leg IV: tibia, basitarsus, and telotarsus each with a single sensitive seta. Subterminal tarsal setae furcate, each branch with only few spinules.

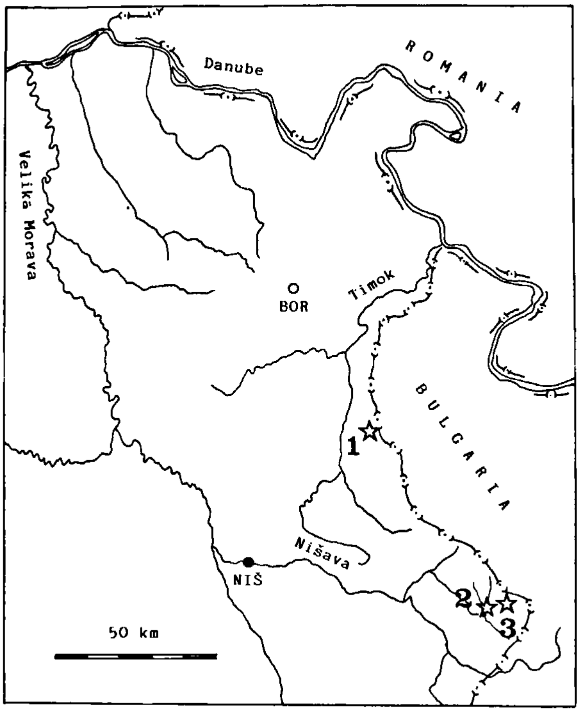


Fig. 19. Distribution of three species of the genus *Roncus* L. Koch in eastern Serbia (Yugoslavia): 1, *R. svanteviti* n. sp.; 2, *R. svarozici* n. sp.; 3, *R. pljakici* Ćurčić, 1973.

Morphometric ratios and linear measurements are presented in Table I.

Distribution. – Southeastern Serbia (Yugoslavia), in caves (Fig. 19). Endemic, relict species. Possibly it also inhabits western Bulgaria, as noted by Guéorguiev (pers. comm.) and Beron (pers. comm.).

Remarks. – This supplementary description of *R. pljakici* is necessary for the better understanding of its morphology, since the species was described from a limited number of specimens (Ćurčić, 1973).

This species is most related to *R. parablothroides* and *R. anophthalmus* (Ellingsen, 1910), as noticed elsewhere (Ćurčić, 1973). *R. pljakici* is probably an endemic pseudoscorpion, specialized to life in caves.

Conclusions and discussion

The genus *Roncus* has a wide distribution throughout western Europe and the Mediterranean area all the way to western Iran, with more than 90 epi- and hypogean species (Gardini, 1983; Ćurčić, 1988, 1991). The knowledge of the taxonomy of this genus at specific level is very limited. Setation and a restricted number of morphometric and meristic characters are usually employed, but these may be useful mainly in distinguishing between relict or highly specialized species. The "homogeneous" features of most epigean species (as manifested by the similar gross morphology, chelal dentition, and setation of carapace and abdomen) make the use of the above-mentioned characters difficult for taxonomic purposes (Gardini, 1981, 1983; Ćurčić, 1988).

Gabbutt & Vachon (1967) described the external morphology of *R. lubricus* and Gardini (1983) redescribed the type-species of the genus from the male lectotype from Bloxworth, Dorset, U.K. Although it was impossible to determine the true distribution pattern of *R. lubricus*, it was suggested that all English populations may belong to this species as well as the Breton, Parisian, and Belgian populations. Such a distribution pattern may be of the "type armoricain" as proposed by Jeannel (1942) and later confirmed by Gardini (1983). It is evident that the *R. lubricus* complex is a diverse group of species widely distributed throughout a large part of the generic range (eastwards to Greece, Turkey, and Iran). Hence, the revision of this species complex became necessary.

The present study of a sample of *Roncus*, from leaf-litter and humus, proved that this form, living in southeastern Serbia, belongs to a new species (*R. svarozici* n. sp.), which seems to be close to *R. lubricus* in terms of its gross morphology. At this moment, it appears that *R. lubricus* might belong to a group of species, distributed over western and southwestern Europe, and *R. svarozici* to another group, which may comprise species inhabiting eastern and southeastern Europe (and, perhaps, southwestern Asia). The main distinctions between the species of the two groups are manifested by the presence of microsetae (proximal to *eb* and *esb*) in members of the former group and by their distribution patterns. A preliminary analysis of the geographical distribution of the presence/absence of microsetae proximal to *eb* and *esb* in some species from southeastern Europe (Ćurčić, in prep.) supports this assumption.

Another problem concerns the process of colonization of cave habitats by different species of pseudoscorpions. One of the most successful invaders of cave habitats in the central, eastern, and southern Balkans is *R. parablothroides.* This species has been found in numerous caves in Serbia, Macedonia, Bulgaria, and Turkey (Ćurčić & Beron, 1981). Thus, its distribution covers a large area from Macedonia in the west to Turkey in the east, and from Serbia in the north to Greece in the south.

According to Ćurčić & Beron (1981), *R. parablothroides* is related to the cavernicolous pseudoscorpions *R. pljakici, R. sotirovi,* and *R. mahnerti* Curčić & Beron, 1981; *R. parablothroides* seems to be related to *R. svanteviti* n. sp. as well. The limited distribution areas of these species are found mainly within that of *R. parablothroides* or in its periphery. If one bears in mind their geographical distribution patterns as well as the (paleo)climatic changes and the evolution of different karst phenomena in the Balkan peninsula, it may be assumed that *R. pljakici, R. svanteviti, R. mahnerti,* and other cave species of *Roncus* in this region are descendants of a common ancestor, or direct descendants of *R. parablothroides.* If all these species did originate from *R. parablothroides* indeed, it is probable that their divergent differentiation (or radiation) took place in the course of the formation of the underground karst relief of the Balkan Peninsula, especially in the peripheral parts of the distribution area of the ancestral population.

The existing similarities and differences between the contemporary local populations of *R. parablothroides* inhabiting caves indicate that this pseudoscorpion species is presently in a phase of intensive colonization of subterranean habitats. This process is accompanied, in these isolated populations, by the occurrence of certain adaptations to underground life. These adaptations are more or less evident in all samples of *R. parablothroides* populations which have been studied so far (Ćurčić & Beron, 1981; Ćurčić, in press).

Some other *Roncus* species are probably also active in colonizing caves. Therefore, particular attention should be devoted to the study of different species, presently assigned to the *R. lubricus* complex, since the presence of their populations has already been established in a number of caves in Serbia and elsewhere in the Balkan peninsula (Ćurčić, in press).

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