

NEOBISIUM BLOTHROIDES (TÖMÖSVÁRY, 1882)
(NEOBISIIDAE, PSEUDOSCORPIONES): AN ENDEMIC
SPECIES FROM ROMANIA

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The species "*Obisium*" *blothroides* was discovered and described from a single cave nr. Mehadia, Romania. At that time, Mehadia was part of the Austro-Hungarian Empire, which accounts for the later hence further mistake made by BEIER (1932, 1963) who claimed that the species inhabits "SO-Ungarn". However, *Neobisium blothroides* can be regarded as an endemic and relict form inhabiting a number caves in Romania, already cited in this paper. Although its habitus resembles that of cavernicolous pseudoscorpions, the presence of anterior and (reduced) posterior eyes supports the view that it is in the phase of intense colonization of underground milieux in the area studied.

Key words: pseudoscorpions, *Neobisium blothroides*, endemism, relicts, cave fauna, Romania.

INTRODUCTION

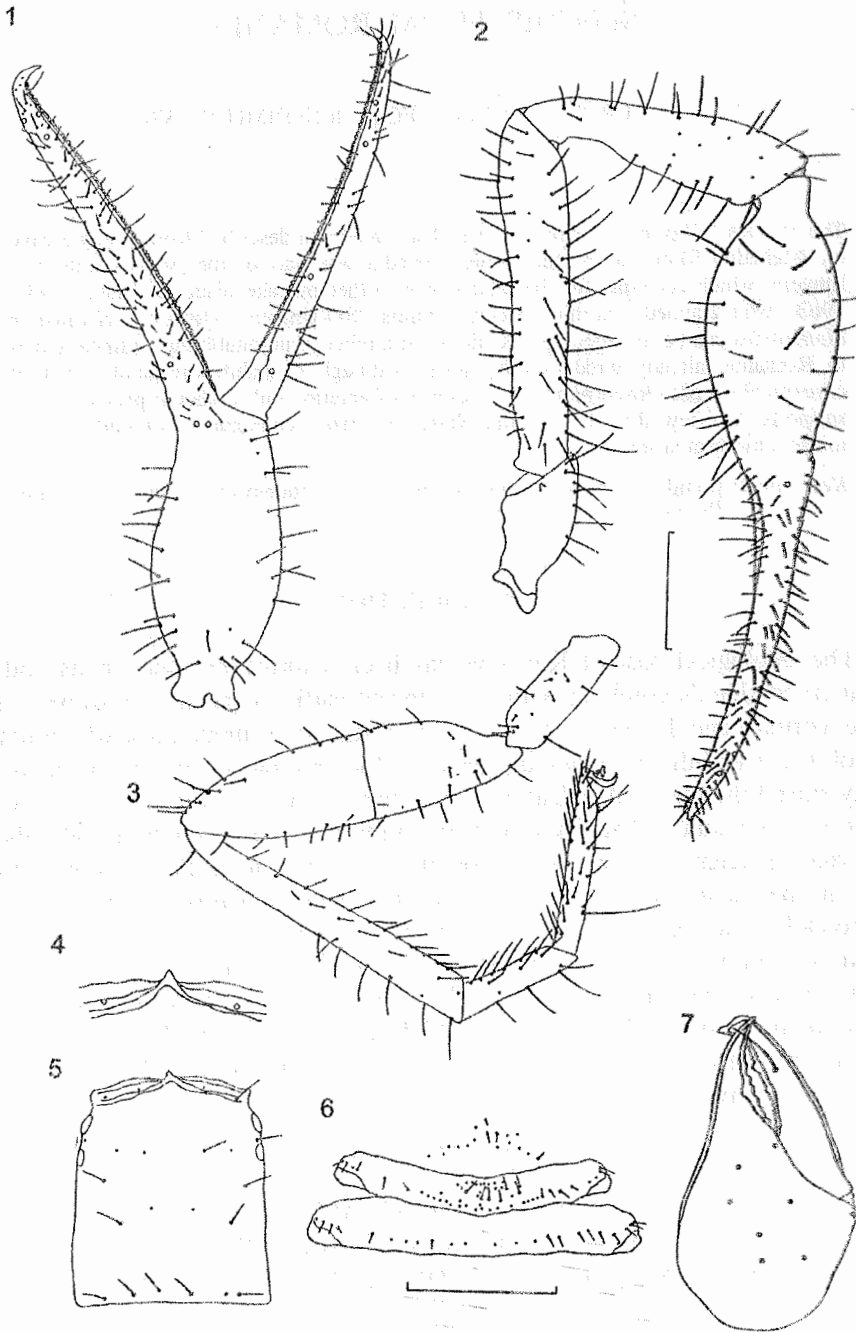
The geological past of Romania has been a tormented one; in its soil, very ancient fixed shields combine with more recent earths, formed by sedimentation in the pre-Tertiary and Tertiary seas. There are lofty young mountains, which make up most of the Carpathian mountain ranges. More remote or more recent volcanic activity raised the chain of volcanoes in Eastern Transylvania and isolated cones in the Western Mountains and elsewhere. In addition to this, erosion brought about by Quarternary glaciers, gradual descent of running water into valleys, unloosing of the lateral gradients, formation of new (dry) land in flood plains, and advance of the Danube Delta towards the sea have completed the details of Romania's hilly regions.

In the present study, four samples of cave pseudoscorpions collected in Romanian caves have been analyzed, diagnosed and described; they all belong to *Neobisium blothroides* (Tömösváry), which is here considered to be a relict and endemic form of the underground habitats that are otherwise widely distributed in the area under investigation.

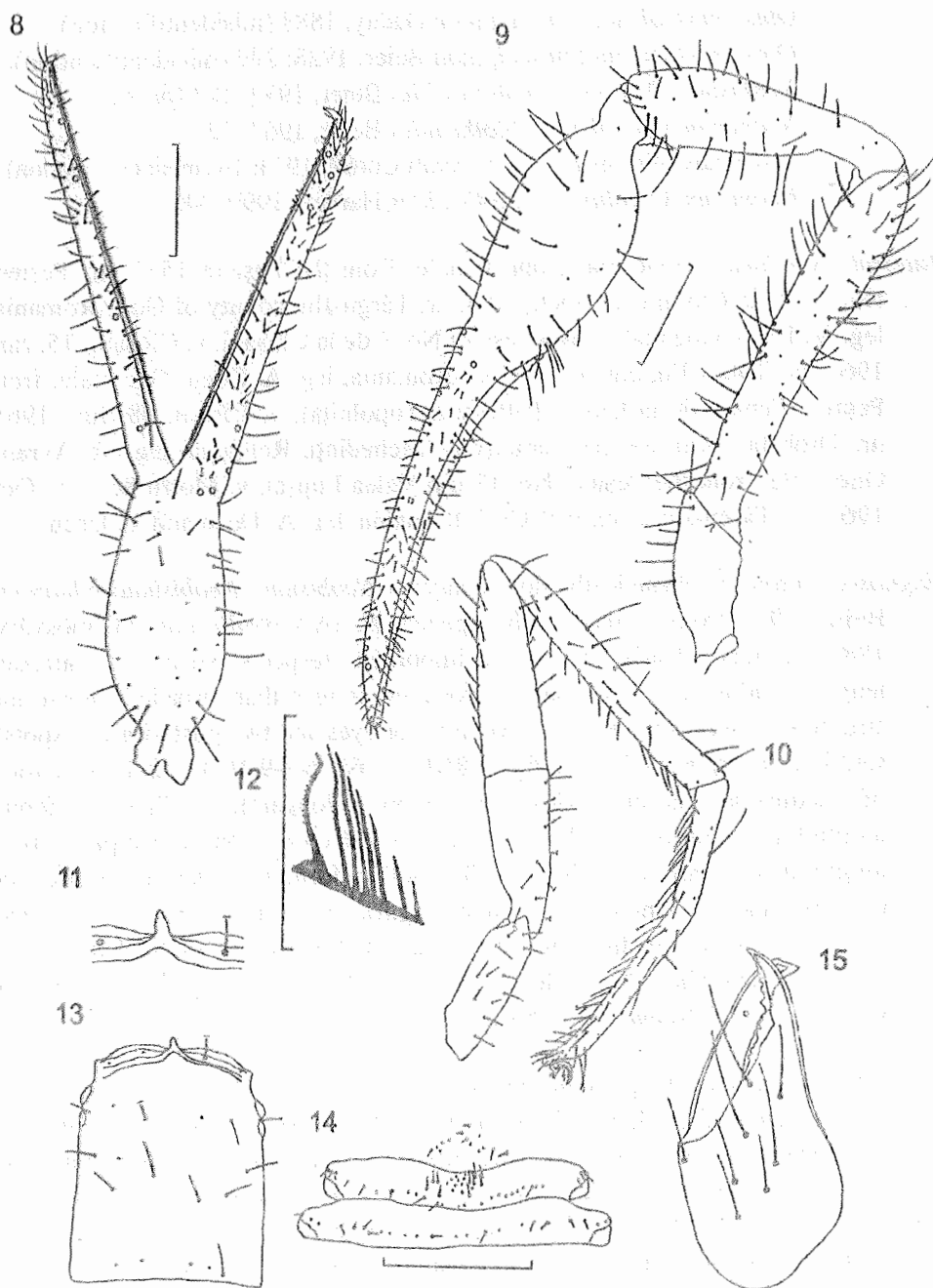
SYSTEMATIC PART

NEOBISIIDAE J. C. CHAMBERLIN
NEOBISIUM J. C. CHAMBERLIN
NEOBISIUM BLOTHROIDES (TÖMÖSVÁRY, 1882)
(Figs. 1–28)

Synonyms – *Obisium blothroides* Tömösváry, 1882: 224.



Figs. 1-7. - *Neobisium blothroides* (Tömösváry, 1872): Male, from Peștera 1572, nr. Târgu-Jiu;
 1 - pedipalpal chela; 2 - pedipalp; 3 - leg IV; 4 - epistome; 5 - carapace; 6 - genital area;
 7 - chelicera. Scales = 0.25 mm (Figs. 4, 7) and 0.50 mm (Figs. 1-3, 5, 6).



Figs. 8–15. – *Neobisium blothroides* (Tömösváry, 1872): Male, from Peștera Femeii de la Cireșu, (=Peștera Topolnița), nr. Drobeta – Turnu Severin; 8 – pedipalpal chela; 9 – pedipalp; 10 – leg IV; 11 – epistome; 12 – flagellum; 13 – carapace; 14 – genital area; 15 – chelicera. Scale lines = 0.25 mm (Figs. 11, 12, 15) and 0.50 mm (Figs. 8–10, 13, 14).

- Obisium (Obisium) praecipuum* Daday, 1888 (misidentification).
Obisium (Obisium) praecipuum Beier, 1928: 299 (misidentification).
Neobisium (Neobisium) blothroides Beier, 1932: 103 (part.).
Neobisium (Neobisium) blothroides Beier, 1963: 127.
Neobisium (Neobisium) blothroides Ćurčić, 1974: 16 (misidentification).
Neobisium (Neobisium) blothroides Harvey, 1990: 348.

Material examined. – One male, one female, from the Peștera 1572, nr. Peștera No. 14 de la Cloșani, 15. Oct. 1964, nr. Târgu-Jiu, county of Gorj, Romania, leg. V. Decu. One male, from Peștera No. 4 de la Cloșani, v. Cloșani, 15. Jan. 1961, nr. Târgu-Jiu, county of Gorj, Romania, leg. A. Decu. One male, from Peștera Femeii de la Cireșu (=Peștera Topolnița), v. Cireșu, 08. Jun. 1965, nr. Drobeta-Turnu Severin, county of Mehedinți, Romania, leg. Șt. Avram. One male, from the Peștera No. 13 din Valea Lupșei, v. Motru Sec, 15. Oct. 1960, nr. Târgu-Jiu, county of Gorj, Romania, leg. A. Decu and V. Decu.

Diagnosis – From its phenetically close congener *Neobisium (Neobisium) biharicum* Beier, 1939 from Romania, the species *N. (N.) blothroides* (Tömösváry, 1882) differs clearly in many important respects such as: carapace length/breadth ratio (as long as broad vs. longer than broader), form and structure of eyes (four eyes vs. two anterior eyes and two posterior eye spots), setation of tergites I–V (6-6-6-6/8-8/10 vs. 6/7-6/7-9/10-11/12-10/12), form of pedipalpal articles (less vs. more elongate), pedipalpal femur length/breadth ratio (4.60-4.80 vs. 5.19-7.13; Beier, 1963), pedipalpal tibia length/breadth ratio (2.90-3.10 vs. 3.33-4.00), form and disposition of chelal teeth (of unequal length vs. of equal length), carapace length (1.00-1.18 mm vs. 1.18-1.45 mm), pedipalpal tibia breadth (0.42-0.90 mm vs. 0.34-0.41 mm), and pedipalpal chelal finger length in males (1.72 mm vs. 1.80-2.03 mm) and females (1.95-2.10 mm vs. 1.95 mm).

Description – Carapace longer than broad (Figs. 5, 13, 21; Table 1), epistome large and triangular (Figs. 4, 11, 20). With two well-developed anterior eyes and two reduced eyes (spot-like). One or two mesosetae are borne distal to each anterior eye. Setal carapacial formulae: $4 + 6 + 6 + 9 = 25$ (female), and $4 + 6 + 6 + 6 = 22$, $4 + 7 + 6 + 7 = 24$ and $4 + 6 + 6 + 5 = 21$ (males). The normal formula is probably $4 + 6 + 6 + 6 = 22$. Carapace slightly reticulate throughout.

Abdominal tergites with 7-7-9-11-12-12-11-11-10-9 setae (female) and with 6-7-10-11-12-11-11-11-11-9, 7-6-10-12-11-11-11-11-10-9, 6-6-8-11-10-11-9-10-9-9 and 6-7-9-12-12-12-12-11-11-10 setae (males). Female genital area (Fig. 28): sternite II

with 16 small median and posterior setae; sternite III with 31 posterior setae and five small suprastigmal setae on either side. Sternite IV with 15 posterior setae and with three small setae along each stigma; sternites V–X with 16-17-16-16-15-13 setae. Male genital area (Figs. 6, 14, 19): sternite II with 14-17 anterior and median setae, sternite III with 19-23 anterior, 19-27 posterior and four suprastigmatic microsetae on either side. Sternite IV with 15-17 posterior setae and three or four small setae along each stigma. Sternites V–X with 18-16-16-17-14-11, 14-15-16-15-15-11, 16-14-14-14-14-13 and 20-21-20-18-16-13 setae. Twelfth abdominal segment with two pairs of small setae. Pleural membranes granulostriate.

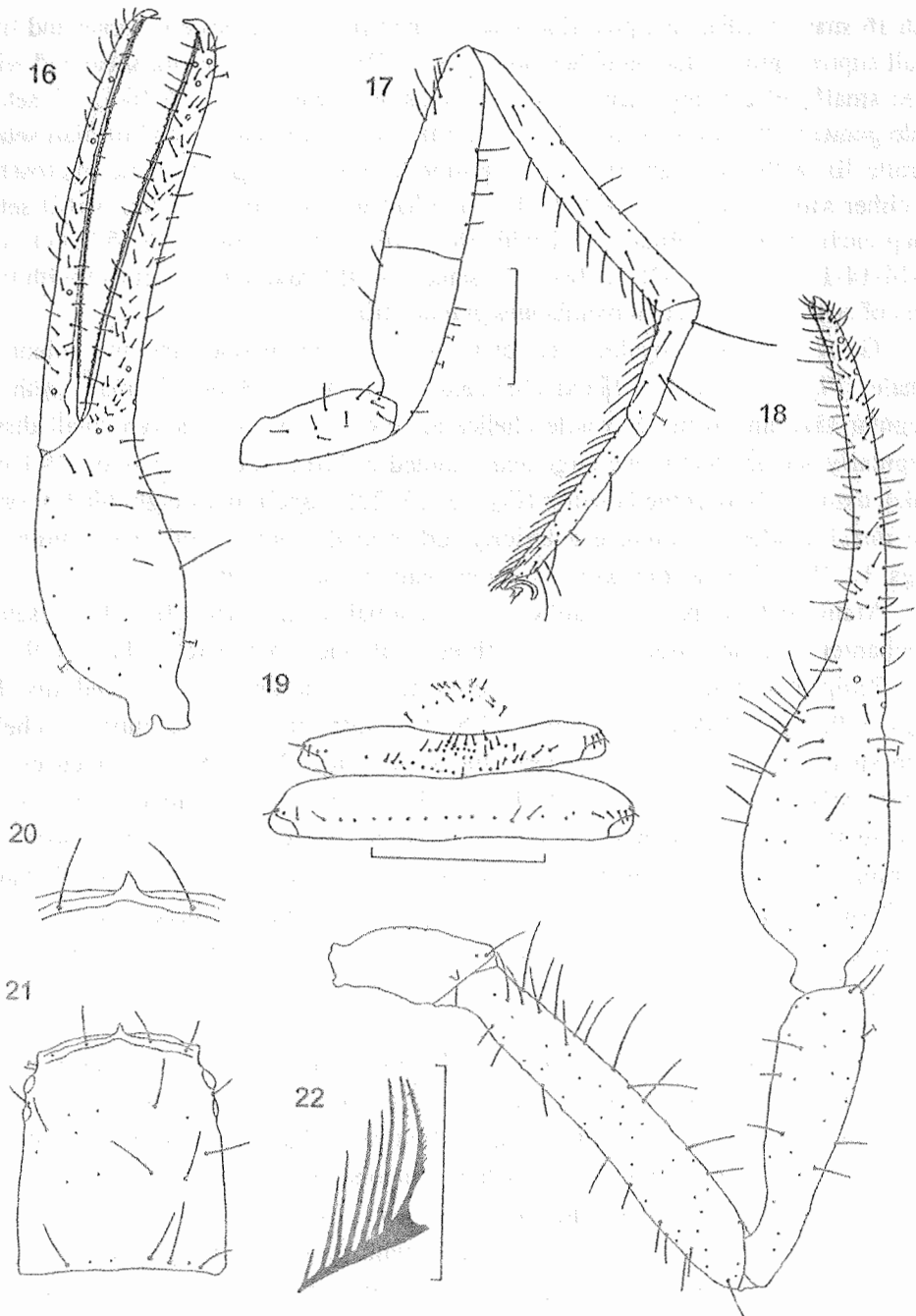
Galea of a low hyaline convexity (males), but distinct and prominent in female (Figs. 7, 15, 27). Fixed cheliceral finger with 13 or 17 small teeth of irregular size and form. Movable cheliceral finger with six or seven small distal irregularly shaped teeth, one large and rounded or bifid tooth and row of 5-9 teeth which eventually become lamellar (Figs. 7, 15, 27), flagellum of eight blades; only two distal blades are pinnate anteriorly; other blades are smooth and acuminate (Figs. 12, 22). The most proximal flagellar blade is the smallest.

Manducatory process (apex of pedipalpal coxa) with five long setae. Trochanter with one larger and two or three small and low tubercles (Figs. 2, 9, 18, 24). Pedipalpal articles smooth and elongate, femur and tibia dilated distally (Figs. 2, 9, 18, 24). Pedipalpal femur with a tiny anterior and lateral tubercle, chelal palm slenderly ovate, chelal fingers attenuated (Figs. 2, 9, 18, 24). Fixed chelal finger with 120 (female) and 101-127 (males) small teeth of almost equal size; these teeth are subtriangular but gradually become lower, smaller, and close-set, reaching the level of trichobothrium **ib**. Movable chelal finger with 82 (female) or 78–88 small and close-set teeth (males); distally, these are pointed, subtriangular, and retroconical. From the level of **t** backwards, they are gradually replaced by slightly lower, rounded or square-topped teeth that end before the level of the trichobothrium **b**.

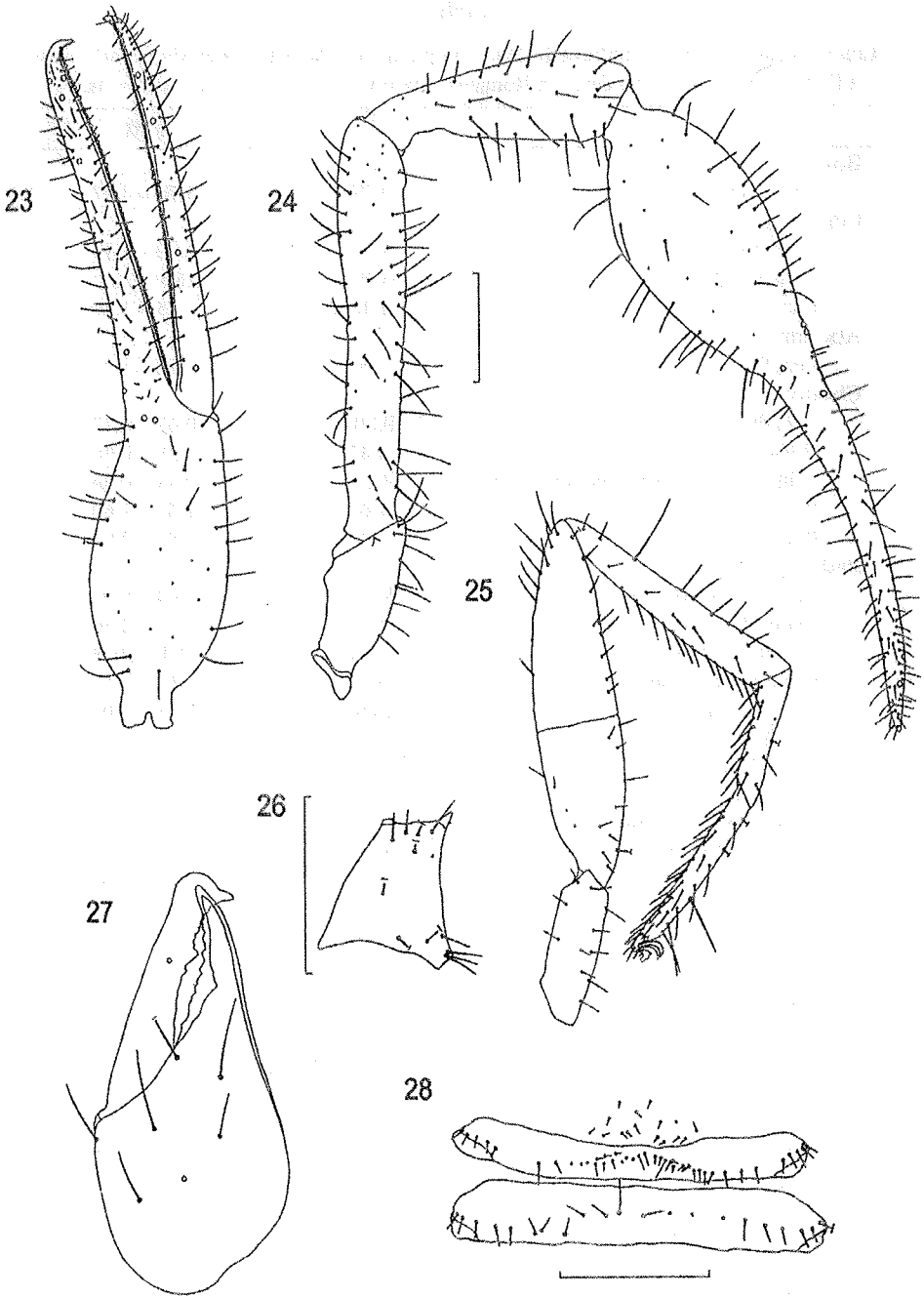
Trichobothriotaxy: **eb**, **esb**, **ib** and **isb** on the finger base, **it**, **et** and **est** on the finger top, **ist** close to the distal group of trichobothria. Setae **b** and **sb** in proximal, and **t** and **st** in distal finger half. Distance **sb-st** more than twice as long as **t-st** and more than 1.5 times as long as **b-sb**. Chelal fingers considerably longer than chelal palm; pedipalpal femur shorter than chelal fingers (Table 1).

Anterior and median rim of coxa I with a small protuberance carrying numerous chitinous points. All leg IV articles almost parallel-sided (Figs. 3, 10, 17, 25). Tibia IV with one or two, metatarsus IV with one or two, and tarsus IV with a single sensitive seta. Subterminal tarsal setae furcate, each branch with few spinules.

All morphometric ratios and linear measurements are presented in Table 1.



Figs. 16–22. – *Neobisium blothroides* (Tömösváry, 1872): Male, from Peștera No. 4 de la Cloșani, nr. Târgu-Jiu; 16 – pedipalpal chela; 17 – leg IV; 18 – pedipalp; 19 – genital area; 20 – epistome; 21 – carapace; 22 – flagellum. Scale lines = 0.25 mm (Figs. 20, 22) and 0.50 mm (Figs. 16–19, 21).



Figs. 23–28. *Neobisium blothroides* (Tömösváry, 1872): Female, from Peștera 1572, nr. Târgu-Jiu;
 23 – pedipalpal chela; 24 – pedipalp; 25 – leg IV; 26 – coxa I; 27 – chelicera; 28 – genital area.
 Scale lines = 0.25 mm (Figs. 26, 27) and 0.50 mm (Figs. 23–25, 28).

Table 1

Linear measurements (in millimetres) and morphometric ratios in *Neobisium blotroides* (Tömösváry) from some caves in Romania. Abbreviations: F = female, MM = males

Character	F	MM
Body		
Length (1)	4.79	3.76 – 4.27
Cephalothorax		
Length (2)	1.18	1.00 – 1.10
Breadth (2a)	1.00	0.80 – 0.855
Ratio 2/2a	1.18	1.25 – 1.29
Abdomen		
Length	3.60	2.70 – 3.24
Chelicerae		
Length (3)	0.805	0.67 – 0.77
Breadth (4)	0.42	0.36 – 0.38
Length of movable finger (5)	0.50	0.44 – 0.49
Ratio 3/5	1.61	1.52 – 1.60
Ratio 3/4	1.92	1.86 – 2.03
Pedipalps		
Length with coxa (6)	8.835	7.64 – 8.74
Ratio 6/1	1.84	1.85 – 2.30
Length of coxa	1.14	0.845 – 0.99
Length of trochanter	0.98	0.68 – 0.83
Length of femur (7)	1.895	1.64 – 2.01
Breadth of femur (8)	0.35	0.23 – 0.32
Ratio 7/8	5.34	5.75 – 7.13
Ratio 7/2	1.605	1.64 – 1.83
Length of patella (tibia) (9)	1.46	1.345 – 1.40
Breadth of patella (tibia) (10)	0.41	0.34 – 0.37
Ratio 9/10	3.56	3.78 – 4.00
Length of chela (11)	3.36	3.04 – 3.51
Breadth of chela (12)	0.74	0.55 – 0.69
Ratio 11/12	4.54	4.90 – 5.60
Length of chelal palm (13)	1.41	1.24 – 1.48
Ratio 13/12	1.905	2.00 – 2.07
Length of chelal finger (14)	1.95	1.80 – 2.03
Ratio 14/13	1.38	1.37 – 1.46
Leg IV		
Total length	6.32	5.60 – 6.15
Length of coxa	0.64	0.585 – 0.66
Length of trochanter (15)	0.77	0.66 – 0.74
Breadth of trochanter (16)	0.26	0.21 – 0.24
Ratio 15/16	2.96	3.00 – 3.14
Length of femur + patella (17)	1.71	1.52 – 1.73
Breadth of femur + patella (18)	0.41	0.36 – 0.38
Ratio 17/18	4.17	4.22 – 4.805
Length of tibia (19)	1.54	1.355 – 1.44

Breadth of tibia (20)	0.20	0.12 – 0.23
Ratio 19/20	7.70	6.26 – 8.47
Length of metatarsus (21)	0.69	0.61 – 0.68
Breadth of metatarsus (22)	0.14	0.12 – 0.13
Ratio 21/22	4.93	5.08 – 5.67
Length of tarsus (23)	0.97	0.87 – 1.00
Breadth of tarsus (24)	0.11	0.10
Ratio 23/24	8.82	8.70 – 10.00
TS ratio-tibia IV	0.36	0.32 – 0.42
TS ratio-metatarsus IV	0.13	0.13 – 0.15
TS ratio-tarsus IV	0.23	0.22 – 0.285

REMARKS

The species "*Obisium*" *blothroides* was discovered and described from a single cave nr. Mehadia, Romania (TÖMÖSVÁRY 1882, p. 225: "Lelőhelye hazánkban a mehádiai barlang, hol 1880-ik év nyarán fedeztem fel s utánam ugyanott Pável János is talált egy példányt."). At that time, Mehadia was part of the Austro-Hungarian Empire, which accounts for the later hence further mistake made by BEIER (1932, 1963) who claimed that the species inhabits "SO-Ungarn".

After CHAMBERLIN (1930), "*Obisium*" *blothroides* was transferred into the genus *Neobisium* Chamberlin. Additionally, it is interesting to note that the name "*blothroides*" was derived from the superficial resemblance of *N. blothroides* to *Obisium* (*Blothrus*) *brevipes* Frivaldszky [= *Neobisium brevipes* (Frivaldszky), (TÖMÖSVÁRY 1882)].

However, *Neobisium blothroides* can be regarded as an endemic and relic form inhabiting a number caves in Romania (Mehedinți Mountains), already cited in this paper. Although its habitus resembles that of cavernicolous pseudoscorpions, the presence of anterior and (reduced) posterior eyes supports the view that it is in the phase of intense colonization of underground milieux in the area studied.

REFERENCES

- BEIER, M., *Die Pseudoscorpione des Wiener Naturhistorischen Museums I. Hemictenodactyli*. An Naturhistor. Mus. Wien 42, 285–314, 1928.
- BEIER, M., *Pseudoscorpionidea. I. Subordn. Chthoniinea et Neobisiinea*. Das Tierreich 57, 1–259, 1932.
- BEIER, M., *Ordnung Pseudoscorpionidea (Afterskorpione)*. Bestimmungsbücher zur Bodenfauna Europas 1, 1–313, 1963.
- CHAMBERLIN, J. C., *A synoptic classification of the false scorpions of chela-spinners with a report on a cosmopolitan collection of the same. Part II. The Diplosphyronida (Arachnida Chelonethida)*. Ann. Mag. nat. Hist., (10) 5, 1–48, 585–620; London, 1930.

- ĆURČIĆ, B., P., M., *Catalogus Faunae Jugoslaviae. III/4. Arachnoidea, Pseudoscorpiones*. Acad. Sci. Art. Slov., 1–35, Ljubljana, 1974.
- DADAY, E., *Neue Daten zur Kenntnis der Pseudoskorpioniden-Fauna von Ungarn*. Termész. Füzetek **12**, 25–28, 1888.
- HARVEY, M., S., *Catalogue of the Pseudoscorpionida*. Manchester University Press, 1–726, Manchester & New York, 1990.
- TÖMÖSVÁRY, O., *Pseudoscorpiones Faunae Hungaricae*. Magyar Akad. Math. Termész. Közlem. **18**, 135–256, 1882.

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