A contribution to the study of the genus *Centromerus* Dahl (Araneae: Linyphiidae) in caves of the Balkan Peninsula

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A contribution to the study of the genus *Centromerus* Dahl (Araneae: Linyphiidae) in caves of the Balkan Peninsula. - *Centromerus serbicus* Deltshev sp. n. is described from specimens previously attributed to *C. prope dacicus*. The taxonomic relationships between *C. bulgarianus*, *C. dacicus* and *C. serbicus* sp. n. are discussed and new illustrations are presented. These are closely allied and strictly vicariant species forming a superspecies. *C. acutidentatus* Deltshev, sp. n. is described from caves in Serbia, Bulgaria and Macedonia. This species is closely related to *C. obenbergeri* Kratochvíl & Miller and to *C. gentilis* Dumitrescu & Georgescu. The hitherto unknown female from *C. obenbergeri* is described.


INTRODUCTION

Deltshhev and Ćurčić (1997) analyzed the taxonomic and phylogenetic interrelationships between the spiders of the *C. europaeus* species group (i.e. *C. bulgarianus* Drensky, *C. subcaecus* Kulczyński, *C. dacus* Dimitrescu & Georgescu) from caves of the Balkan Peninsula. A troglobitic spider found in the Zlotska Pecina Cave (Serbia) was first identified as *C. prope dacicus* and the study of additional material in comparison with material of *C. dacus* later showed that the species is new to science. It is here discussed as *C. serbicus* sp. n. Another new species *C. acutidentatus* sp. n., which is closely related to *C. obenbergeri* Kratochvíl & Miller and *C. gentilis* Dimitrescu & Georgescu, was collected from the leaf litters and from caves of Serbia, Bulgaria and Macedonia. *Centromerus obenbergeri* is redescribed and the hitherto unknown female of this species is illustrated for the first time.

Abbreviations: Names of collectors are abbreviated as follow: R.N. Dimitrijević - RND; O.S. Karamata - OSK; L.R. Lučić - LRL; S.E. Makarov - SEM; A.M. Petrović - AMP; V.M. Pesić - VMP; S.V. Stancović - SVS; G.S. Stojanović - GSS; E.A. Stojkoska; V.T. Tomic - VTT; B.P.M. Ćurčić - BPMC; S.B. Ćurčić - SBĆ; N.B. Ćurčić - NBĆ; B. Petrov - BP.

All measurements are in mm.

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DESCRIPTIONS (AND REDESCRIPTION)

Centromerus serbicus Deltshev sp. n.

Figs 1, 2, 7, 8


Depository: The collection of the Institute of Zoology, Faculty of Biology, University of Belgrade, Yugoslavia; 1♂ and 3♀ paratypes are deposited in the collection of the Muséum d’historie naturelle in Geneva, Switzerland.

Comparative material: C. bulgarianus (lectotype, deposited in the collection of Zoology, Sofia): Fig. 5; C. dacicus, Figs 3, 4, 6 (specimens from Pestua “E.A. Martel”, 8 March 1960, deposited in the collection of Institut de Spéologie “E. Racovitza”).

Etymology: The species name is derived from Serbia.

Diagnosis: C. serbicus sp. n. is a blind species, closely related to C. bulgarianus and C. dacicus, distinguished from them by the following differential features (figs 1-7): C. serbicus sp. n. is larger and possesses a larger palp; the embolic division is similar but the terminal apophysis is longer and larger (figs 5-7); the lamella (sensu Merret, 1963) appears to be similar to those of C. bulgarianus and C. dacicus, but differs in details (figs 1-4); females are almost indistinguishable, but there are differences in details of the epigyne.

Description: Male/female: Total length 1.8/2.16. Cephalothorax, length 0.79/0.82, width 0.61/0.57; sternum, length 0.39/0.42, width 0.42/0.42; abdomen, length 0.97/1.26. Cephalothorax similar in both sexes, yellow to yellow brown. Abdomen grey to pale grey. Eyes completely absent. Chelicerae yellow brown, armed with 3 teeth on outer row and 3-4 denticles on inner row. Legs: IV-I-II-III. I: Fe. 1.15/1.26 , Pl+Ti. 1.40/1.40, Mt. 0.9/0.9. Ta. 0.61/0.57. Femora I with a prolateral spine in apical half. Tibiae I-III with 2 dorsal spines. Tibia IV with 1 dorsal spine. Metatarsi I-II with 1 small dorsal spine.

Male palp (figs 1, 2, 7). With a strong dorsal spine on patella. Cymbium with a postero-dorsal protuberance. Paracymbium large, with serrated inner margin; 3-4 short hairs near proximal end. Embolic membrane well - presented, with strongly serrated outer margin. Terminal apophysis lamellar. Lamella characteristically built, continuous with radix.

Epigyne presented on figure 8.

Affinities: C. serbicus sp. n., C. bulgarianus and C. dacicus are closely allied and strictly vicariant species forming a superspecies. They belong to the europaeus-group of the genus Centromerus on the Balkan peninsula. All these taxa are similar, they have limited ranges and probably, represent the descendants of a common ancestor; it is assumed that this ancestral form is no longer present in the epigean fauna and that it has been replaced by an extant Centromerus (Deeleman-Reinhold, 1976, Deltshev & Ćurčić, 1997).
Figs 1-4

1. *Centromerus serbicus* Deltshev sp. n., left male palp, external view; 2. ditto, internal view; 3. *C. dacicus* Dumitrescu & Georgescu, left male palp, external view; 4. ditto, internal view. Scale line 0.1 mm.

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1, *Centromerus serbicus* Deltshev sp. n., left male palp, external view; 2, ditto, internal view; 3, *C. dacicus* Dumitrescu & Georgescu, left male palp, external view; 4, ditto, internal view. Scale line 0.1 mm.
Figs 5-8

5-7, terminal apophysis of *Centromerus bulgarianus* (Drensky) (5), *C. dacicus* Dumitrescu & Georgescu (6), *C. serbicus* Delshev sp. n. (7); 8, *C. serbicicus* Delshev sp. n. vulva and epigyne, ventral view. Scale lines 0.1 mm.
**Centromerus acutidentatus** Deltshev sp. n. Figs 9-21

*Centromerus obenbergeri* (Kratochvıl & Miller): Čurčić et al., 1999 (misidentification): 7P.

**Material examined:** YUGOSLAVIA: Monastery Cave I (at the entrance in leaf litter), vill. Selacka near Minicevo, Serbia, 1 ♂ holotype, 4 ♀ paratypes, 15 November 1997 (coll. RND, OSK, VTT, SBC, NBČ); Avala, Carpivev Best (leaf litter) 1 ♀ paratype, 21-24.09.1997 (coll. BPMC, SEM, LRL, VTT); MACEDONIA: Ubava Cave, Matka, klinura Treske, 1 ♂ paratype, 1 juv, 13 July 2000 (coll. SEM, VTT, SBC, GSS, EAS, SVS); BULGARIA: Stursheilitsa Cave, vill. Goleshevo, 1 ♀ paratype, 14 April 1993 (coll. BP); Gaber Reserve, Mt. Planets, Kjustendil, 1 ♂ paratype, 06 April 2001 (coll. BP).

**Depository:** The holotype and 1 paratype (Monastery Cave I) are deposited in the collection of the Muséum d’histoire naturelle in Geneva, Switzerland. The rest, 2 female paratypes from the same locality, as well as the material of Ubava Cave, Macedonia is in the collection of the Institute of Zoology, Faculty of Biology, University of Belgrade, Yugoslavia. The material from the Stursheilitsa Cave and Gaber Reserve, Bulgaria is in the collection of the Institute of Zoology, Sofia, Bulgaria.

**Etymology:** Latin : acutus = sharp; dentatus = dentate. The specific name refers to the sharp teeth on the paracymbium.

**Diagnosis:** *C. acutidentatus* sp. n. is clearly related to *C. gentilis* Dumitresco & Georgesco and to *C. obenbergeri* Kratochvıl & Miller known from the caves in Romania and Montenegro. The new species differs from them by the larger paracymbium armed with the bigger and sharper teeth, by a characteristic lamella with two denticles on its posterior border and by a longer terminal apophysis (figs 9-17).

**Females are very similar, but there are differences in details of the epigynes and vulvae (figs 18-21).**

**Description:** Male/female: Total length 2.16/1.80. Cephalothorax, length 1.0/0.72, width 0.79/0.51; sternum, length 0.54/0.54, width 0.42/0.42; abdomen, length 1.08/1.08. Cephalothorax similar in both sexes, yellow to yellow brown. Abdomen grey to pale grey. Eyes surrounded by a narrow black area; anterior medians almost in contact with each other and ca. 0.75 diam. apart from the laterals; posterior medians ca. 1.25 diam. apart from each other and ca. 0.75 diam. from laterals. Chelicerae yellow brown, armed with 3 teeth on outer row and 4 denticles on inner row. Legs: IV-I-II-III. I: Fe. 0.9/0.72, Pl.+Ti. 1.07/1.07, Mt. 0.61/0.50, Ta. 0.54/0.42. Femora I with a prolateral spine in apical half. Tibiae I-III with 2 dorsal spines. Tibia IV with 1 dorsal spine. Metatarsi I-II with small 1 dorsal spine. Metatarsi I-III with a single trichobothrium.

Male palp (figs 9-17). A strong dorsal spine on patella. Cymbium with a postero-dorsal protuberance. Paracymbium large, with 13-16 well-developed and sharp teeth on inner margin; 4-5 short hairs near proximal end. Embolic membrane well-presented, with strongly serrated outer margin. Terminal apophysis lamellar. Lamella characteristically built, continuous with radix.

Epigyne and vulva presented on figures 18-21.

**Affinities:** *C. acutidentatus* sp. n., *C. gentilis* and *C. obenbergeri* are closely allied. They belong to the *sylvaticus*-group of the genus *Centromerus* on the Balkan peninsula. *C. obenbergeri* and *C. gentilis* are known only from caves, *C. acutidentatus* was collected in caves and from forest.
Figs 9-12

9, *Centromerus acutidentatus* Deltshev sp. n., right male palp, external view; 10, ditto, internal view (specimen from Monastery Cave I, Serbia); 11, ditto left male palp, external view; 12, ditto, internal view (specimen from Gabra Reserve, Bulgaria). Scale line 0.2 mm.
Figs 13-17
13, Centromerus acutidentatus Deltshev sp. n., right male palp external view; 14, ditto, internal view (specimen from Ubava Cave, Macedonia); 15, C. acutidentatus Deltshev sp. n., terminal apopysis (Monastery Cave I, Serbia); 16, ditto (Gabra Reserve, Bulgaria); ditto (Ubava Cave, Macedonia). Scale lines 2.0 mm.
Figs 18-21

18, 20. Centromerus acutidentatus Deltshev sp. n., epigyne and vulva, ventral (18) and dorsal (20) view (specimen from Monastery Cave I, Serbia); 19, 21, ditto (Gabra Reserve, Bulgaria). Scale line 0.1mm.

Centromerus obenbergeri Kratochvil & Miller


Depository: The collection of the Muséum d’histoire naturelle in Geneva, Switzerland.

Description: Male/female: Total length 1.44/1.44. Cephalothorax, length 0.79/0.72, width 0.64/0.54; sternum, length 0.34/0.42, width 0.46/0.42; abdomen, length 0.72/0.9. Cephalothorax similar in both sexes, yellow to yellow brown. Abdomen grey to pale grey. Eyes, small and surrounded by a narrow black area; anterior medians almost in contact with each other and ca. 0.75 diam. apart from the laterals; posterior medians ca. 1.25 diam. apart from each other and ca. 0.75 diam. from laterals. Chelicerae yellow brown, armed with 3 teeth on outer row and 4 denticles on inner row. Legs: IV-I-II-III. I: Fe. 1.0/0.9, Pl.+Ti. 1.21/1.11, Mt. 0.82/0.72, Ta. 0.54/0.54. Femora I with a prolateral spine in apical half. Tibiae I-III with 2 dorsal
Figs 22-26

22. *Centromerus obenbergeri* Kratochvíl & Miller, left male palp, external view; 23, ditto, internal view; 24, terminal apophysis; 25, epigyne, ventral view; 26, vulva, dorsal view. Scale line 0.1 mm (all figures).
spines. Tibia IV with 1 dorsal spine. Metatarsi I-II with 1 small dorsal spine. Metatarsi I-III with a single trichobothrium.


Epigyne and vulva presented on figures 25, 26.

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