Spelaeodiscus dejongi (Gastropoda, Pulmonata, Spelaeodiscidae), its classification hesitantly confirmed

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Velkovrh (1972) questioned the correctness of the type locality of *Spelaeodiscus dejongi*, its habitat, and its generic classification, respectively. Meanwhile it became clear that this species occurs in Crna Gora, not in Slovenia. Its habitat, in caves, turned out to be correct, however. Here we present data on the structure of the genital tract, hesitantly confirming its classification in *Spelaeodiscus*.

Key words: Gastropoda, Pulmonata, Spelaeodiscidae, taxonomy, genital tract, Crna Gora/Montenegro.

Introduction

The troglodític *Spelaeodiscus dejongi* Gittenberger, 1969, was described on the basis of only shell characters. Its so-called type locality, correctly written 'Jama nad Jamo pri grezdu' [cave above the cave near the nest] (Velkovrh, 1972: 124) is located above Vrhnika near Ljubljana in Slovenia, and was investigated thoroughly by Velkovrh. Among over 250 gastropod shells not a single one of *S. dejongi* was found. Therefore Velkovrh suggested a confusion of labels and questioned (1) the occurrence as a troglobiont, (2) the occurrence in the former Yugoslavia, (3) the generic classification. Meanwhile, the first two questions have been answered by Gittenberger (1975). The species should be considered a troglobiont indeed and it does not occur in Slovenia, but far more to the south in Crna Gora (Montenegro). Welter-Schultes (2012: 213) apparently overlooked the latter fact. The third question remained unanswered.

The genital tract of the type species of *Spelaeodiscus* Brusina, 1886, i.e. *S. hauffeni* (F. Schmidt, 1855), has been described and illustrated by Bole (1965: 351, fig. 1B), who additionally compared *S. unidentatus* Bole, 1961. Up to now, the generic assignment of *S. dejongi* remained only conchologically based. However, some time ago a live specimen was collected in the pitch-dark section of a cave, so that also the third question raised by Velkovrh can now be tackled.

Mainly for the sake of stability, following Schileyko

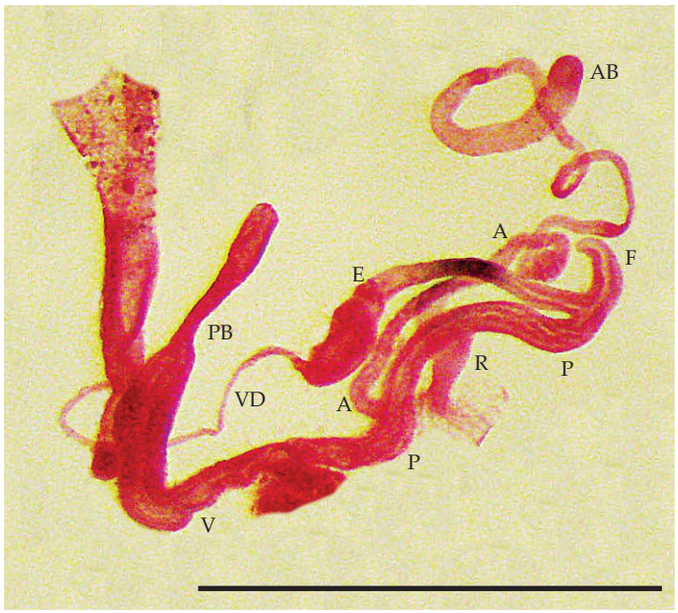

Fig. 1. *Spelaeodiscus dejongi* Gittenberger, 1969. Crna Gora (Montenegro), Spila Požalica WNW of Donja Seoca; E. G. leg. 8.v.1975.
Abbreviations: A, appendix; AB, bursa of the appendix; E, epiphallus; F, flagellum; P, penis; PB, pedunculus of the bursa copulatrix; R, retractor muscle; V, vagina; VD, vas deferens.
Slide RMNH (= Naturalis Biodiversity Center) Moll. 1169. Scale 1 mm.

(1998: 89) and Subai & Dedov (2008), *Aspasita* Westerlund, 1889, is considered a separate genus instead of a subgenus of *Spelaeodiscus*, and classified in a family Spelaeodiscidae, instead of Strobilopsidae.

Results and discussion

The genital tract of *S. dejongi* (Fig. 1) differs from that of the *Spelaeodiscus* species described by Bole (1965) by the insertion of the penial branch of the retractor muscle, which is not situated at the base of the flagellum, but over one third of the length of the penis more proximally. The flagellum forms the continuation of the slender penis, as in *S. unidentatus* (Bole, 1965: fig. 1), but it is much shorter than figured by Bole for the *Spelaeodiscus* species, measuring about 1/3 of the distance between its base and the insertion of the appendix. The proximal two thirds of the epiphallus are tubular and narrower than the penis, whereas the distal third is elongated spindle-shaped and partly broader, with some irregular wrinkles in the lumen; a caecum is at least not prominently present. The vagina is longer than half the length of the bursa copulatrix, whereas it is very short, i.e. about only 1/10 of the bursa copulatrix, in the two *Spelaeodiscus* species described by Bole. The appendix is subdivided into two segments, which are separated by a small, globularly inflated structure with a papilla inside; it has a long and slender proximal part and an even longer distal part, which is somewhat narrower from the transition on, increasing very gradually in width towards an elongated bursa in only its distal half. In the two *Spelaeodiscus* species that were dealt with by Bole, the proximal part of the appendix is much broader and shorter than the distal part. In *S. dejongi* the bursa copulatrix inserts with a very broad pedunculus on the vagina; it narrows rather abruptly to more than a quarter of its width about halfway towards the bursa, increasing slightly in width again while passing into the elongated bursa, which measures only half the width of the basal part of the pedunculus. In *S. hauffeni* the pedunculus is equally broad over its entire length, whereas it is slightly tapering towards the bursa in *S. unidentatus*.

Despite these conspicuous differences, *S. dejongi* and *S. hauffeni* are considered congeneric because the general bauplan of *Spelaeodiscus* and *Aspasita* (see: Hudec, 1961, 1970; Schileyko, 1984, 1998; Subai & Dedov, 2008) can still be recognized in *S. dejongi*. Another argument in favour of accepting a rather variable genus *Spelaeodiscus*, is the fact that a similar variability seems to exist within *Aspasita*, at least according to the data in the literature.

While dissecting the specimen of *S. dejongi*, pigmented eye spots were not seen. Bole (1965: 353) reported the same observation for *S. hauffeni* and *S. unidentatus*. Thus we may conclude that these three species are typical troglobionts occurring from Slovenia (*S. hauffeni*) to Crna Gora (*S. dejongi*, *S. unidentatus*). The genus *Aspasita*, once considered a subgenus of *Spelaeodiscus*, is represented with species that are not restricted to subterraneous habitats in Bulgaria, Slovakia, Rumania and Hungary.

More data are needed to investigate in more detail the phylogenetic relationships between *Spelaeodiscus* and *Aspasita*. A bursa copulatrix with a conspicuously broadened pedunculus and a penial retractor muscle inserting more proximally than the base of the flagellum, two character states that were observed in *Spelaeodiscus* only in *S. dejongi*, are figured for example for *Aspasita triaria* (Rossmässler, 1839) by Schileyko (1998: 92, fig. 101B, C), in a specimen that differs from *S. dejongi*, but not from the two other *Spelaeodicus* species, by an extremely short vagina, and a less slender appendix. Subai & Dedov (2008: 112, figs 1, 2), however, illustrated the genital tract of allegedly the same species, but their specimens have a longer vagina and a retractor muscle inserting at the base of the flagellum. Further considerations would lead outside the scope of this note. For the moment being, we only conclude that *Spelaeodiscus* and *Aspasita* are very similar in their rather variable genital anatomy and most probably closely related taxonomically.

References

Bole, J., 1965. Die Vertreter der Gattung *Spelaeodiscus* Brusina 1886 (Gastropoda, Pulmonata) in Jugoslawien. — International Journal of Speleology 1 (3): 349-356, pls 76-77.

Gittenberger, E., 1975. Beiträge zur Kenntnis der Pupillacea. V. Die Spelaeodiscinae, erster Nachtrag. — Zoologische Mededelingen, Leiden 48 (23): 263-277.

Hudec, V., 1961. Bemerkungen über die Schnecke *Spelaeodiscus tatricus* (Haz.), einen seltenen Endemit, im Gebirge Belanské Tatry. — Biologia, Bratislava 16 (3): 210-216. [In Czech with summary in German].

Hudec, V., 1970. Bemerkungen zur Anatomie einiger Schneckenarten aus Ungarn. — Časopis Národního Muzea 137 (3-4): 33-43. [In Czech with summary in German].

Schileyko, A.A., 1984. Nazemnye mollyuski podotryada Pupillina fauny SSSR (Gastropoda, Pulmonata, Geophila). — Fauna SSSR. Mollyuski 3 (3): 1-400. In Russian.

Schileyko, A.A., 1998. Treatise on recent terrestrial pulmonate molluscs. Part 1. Achatinellidae, Amastridae, Orculidae, Strobilopsidae, Spelaeodiscidae, Valloniidae, Cochlicopidae, Pupillidae, Chondrinidae, Pyramidulidae. — Ruthenica, Supplement 2: 1-127.

Subai, P. & Dedov, I., 2008. A review of the Bulgarian species of *Aspasita* Westerlund, 1889 (Gastropoda; Pulmonata; Spelaeodiscidae), with description of *A. bulgarica* spec. nov. —Basteria 72(4-6): 111-118.

Velkovrh, F., 1972. Some comments to the range of two species of the genus *Spelaeodiscus* Brussina 1886 (Gastropoda, Pulmonata).— Biološki Vestnik 20: 121-126. [In Slovenian with English and German abstract].

Welter-Schultes, F., 2012. European non-marine molluscs, a guide for species identification: 1-674. Göttingen.