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Two new for science *Deroceras* species from France and the Italian island of Sicily (Gastropoda: Pulmonata: Agriolimacidae)

With 17 Figures

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Abstract. Description of two species from France and Sicily, namely *Deroceras adolphi* nov. spec. and *Deroceras giustianum* nov. spec., that differ significantly from all other known slugs.

Kurzfassung. Zwei für die Wissenschaft neue *Deroceras*-Arten von Frankreich und Sizilien (Gastropoda: Pulmonata: Agriolimacidae). - Beschreibung von zwei neuen Arten von Frankreich und Sizilien, *Deroceras adolphi* nov. spec. und *Deroceras giustianum* nov. spec., welche sich signifikant von allen bisher bekannten Nacktschneckenarten unterscheiden.

The present knowledge of Agriolimacidae, including those occurring in more thoroughly investigated regions, is insufficient. This is evidenced by the fact that nearly each year species new for science are discovered, also in comparatively well-known areas. The two species concerned clearly differ from all the other slugs hitherto described. Their characters are so typical that it is not only difficult to confuse them with other species but also to make any comparison with other known slugs. For that reason I can give no references. Both species seem to be indigenous to the areas where they were collected.

The scale bar under figures equals 1 mm.

I wish to thank Prof. ADOLF RIEDEL from the Museum and Institute of Zoology, Polish Academy of Sciences (Warsaw, Poland) for collecting and handing me over the material for this paper.

Deroceras adolphi nov. spec.

Holotypus: Moulis near St. Girons, at the foot of Char de Ligu Mt., under stones in brushwood, Ariège (France), leg. A. RIEDEL 28.02.1964. Mus. Nat. Hist. Wrocław Univ. no. MP 668.

Paratypes: All from France: 1 spec. collected with the holotype (Mus. Zool. Inst. PAN Warsaw); 1 spec. - Moulis, at the foot of Char de Moulis Mt., rock rubble, leg. A. RIEDEL 11.03.1964 (Mus. Nat. Hist. Wrocław Univ.); 3 juv. spec. - Vallée de Bethmale near Castillon (ca 15 km SSW of St. Girons), beech forest at the lake of Lac de Bethmale, under rotting logs, 1070 m a.s.l., leg. A. RIEDEL 22.03.1964 (2 spec. Mus. Zool. Inst. PAN Warsaw, 2 spec. Mus. Nat. Hist. Wrocław Univ.); 2 spec. - Moulis near St. Girons, a small shady ravine close to a spring, in rotting leaf litter, leg. A. RIEDEL 23.03.1964 (1 spec. Mus. Nat. Hist. Wrocław Univ., 1 spec. Mus. Zool. Inst. PAN Warsaw); 1 spec. - Lestelás Mt. near Cazaret,

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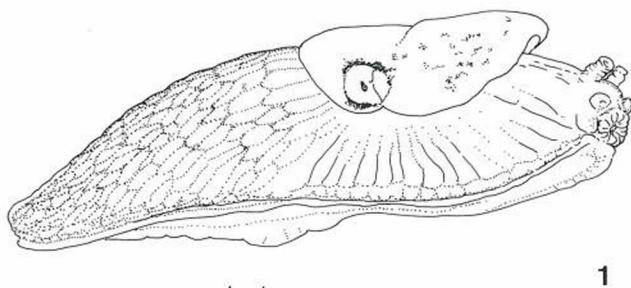
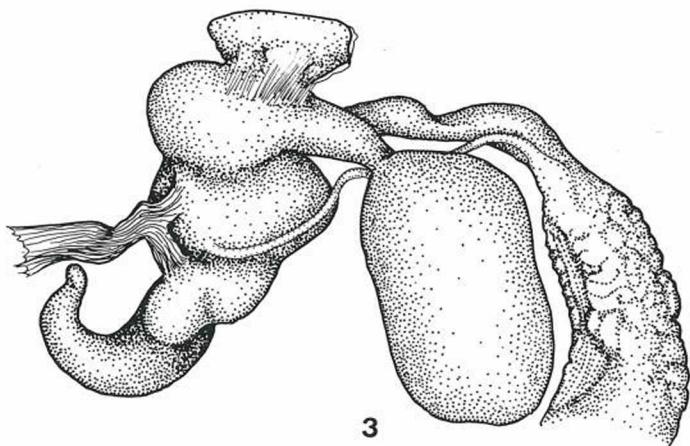
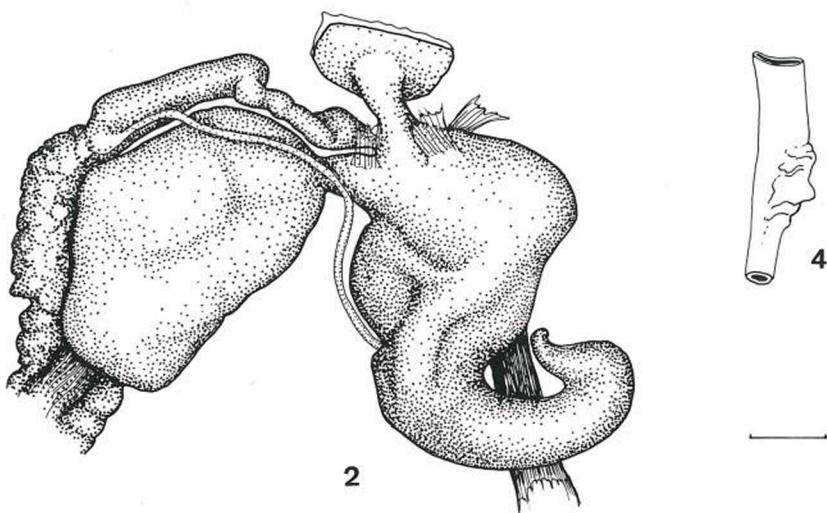
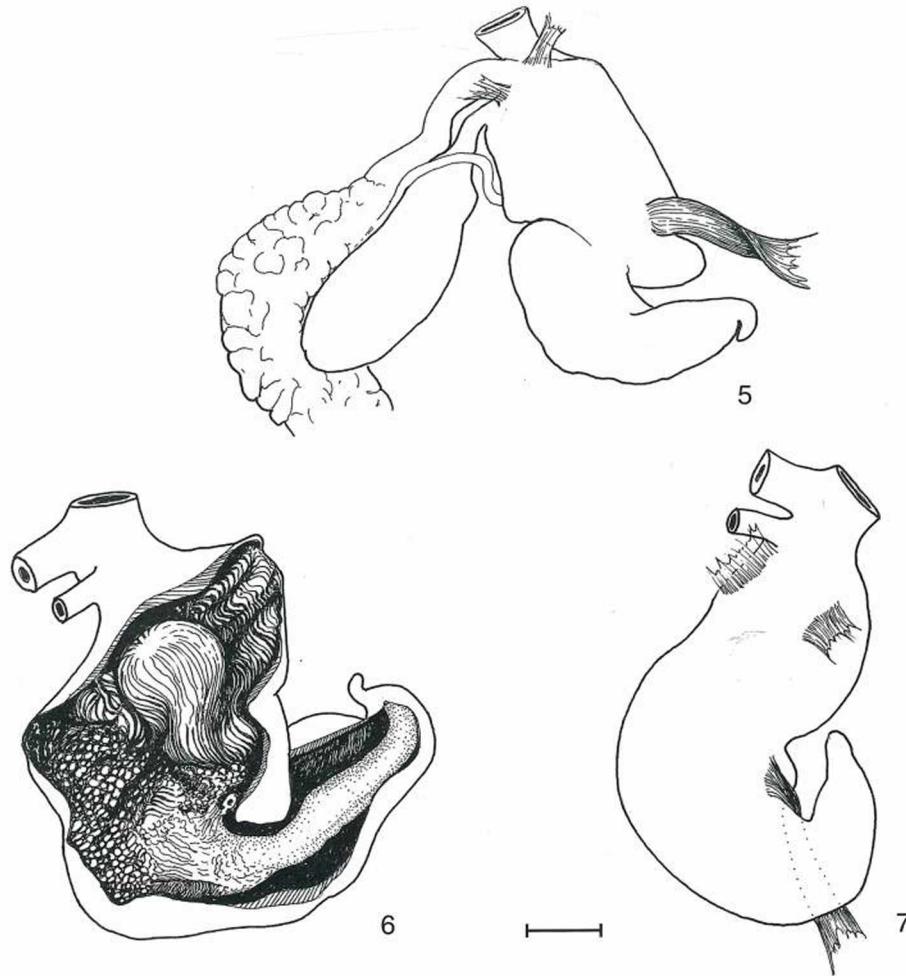


Fig. 1: *Deroceras adolphi* nov. spec. - lateral view of the holotype.



Figs 2-4: *Deroceras adolphi* nov. spec.: 2-3 - copulatory organs of the holotype viewed from two different sides; 4 - rectum of the holotype.

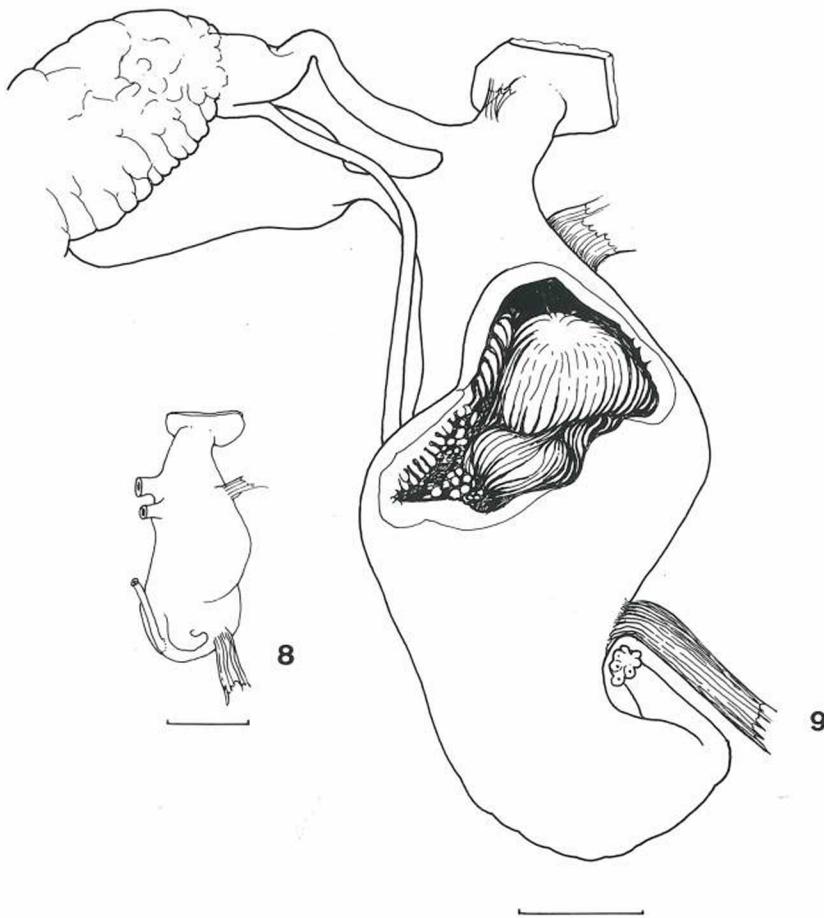


Figs 5-7: *Deroceras adolphi* nov. spec.: 5 - copulatory organs of the paratype from Moulis near St. Girons; 6 - internal structures of penis in the holotype; 7 - penis of the paratype from Vallée de Béthmale.

ca 15 km W of St. Girons (Ariège), rare deciduous forest, under stones, leg. A. RIEDEL 26.02.1964 (Mus. Zool. Inst. PAN Warsaw).

Diagnosis. A large spotted slug. Penial gland, nearly equalling penis in length, in the shape of a bent cone. Its surface is smooth lengthlong, at times only with a few papillae on the end. Stimulator is a low rounded cone. No caecum on rectum; instead there are merely a few furrows on intestine.

Body dimensions. Body length (after preservation) up to 33 mm, mantle length 19 mm, width ca 6.5 mm. Coloration of live slugs unknown, after preservation beige-cream or whitish. Over pneumostom a small black spot irregular in shape (fig. 1). On mantle most often hardly discernible remainings of somewhat darker spotting, the other parts of body



Figs 8-9: *Deroceras adolphi* nov. spec.: 8 - copulatory organs of a small specimen (paratype) from Vallée de Bethmale; 9 - copulatory organs of the paratype from Lestelás Mt. near Cazaret.

usually evenly light creamy-beige but in some specimens, juveniles in particular, pale spotting inconsiderably darker than the background may occur. There are also specimens (those collected in the ravine on 23.03.1964), which are clearly black-spotted both on mantle and the posterior body part. The spots are irregularly distributed, not producing a net-like pattern. Head and tentacles slightly darker than the rest of body. Skin thick, not transparent.

Genitalia (figs 2-3, 5-9). Glandula hermaphroditica in young specimens forms the posterior end of viscera. The only clearly distinctive characters concern penis, which is constricted, thick-walled and provided with inconspicuous distensions. No glandular papillae can be seen on lateral wall in its anterior section. In the posterior one in some adult (!) specimens there is a small transverse appendix. Penial gland in the shape of a thick long process gradually narrowing towards the loose end, its length approximating to that of penis. In mature specimens, the surface of this process is smooth, only in one specimen examined there are a few glandular papillae on its free end (fig. 9). In juveniles, indistinct papillae are sometimes visible under the surface. Besides, in juvenile specimens penial

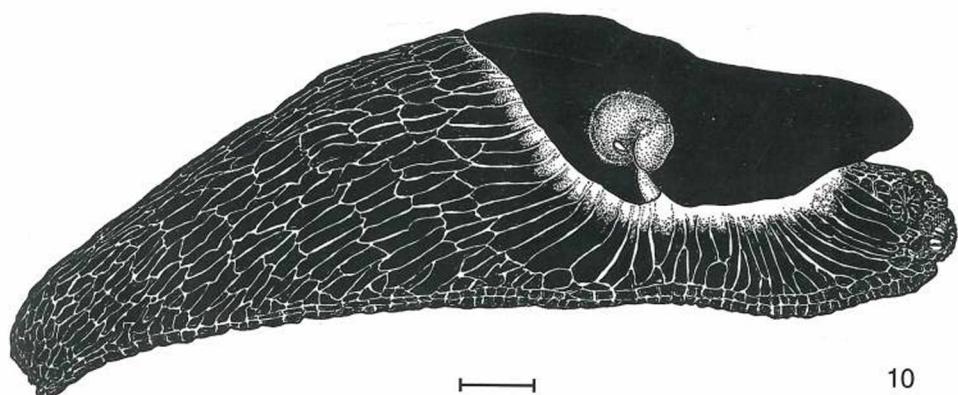


Fig. 10: *Deroceras giustianum* nov. spec. - lateral view of the smallest, immature, paratype.

gland is considerably shorter (fig. 8), in adults enlarging so that to approximate to the length of the rest of penis. Vas deferens opens almost apically at the base of penial gland. Musculus retractor penis inserted somewhat laterally. In juveniles it is not divided whereas in adult specimens, which already have a large penial gland, the muscle produces an offshoot accreted to penial walls at the base of penial gland. Inside penis there is a small rounded cone-shaped stimulator (figs 6 and 9) and a complex system of wrinkles. Inside penial gland, along its whole length, there is a fold in the shape of a narrowing half-cylinder. Spermatheca oval, slightly larger than penis, with a short thick spermatheca duct. A well-developed system of retentors holds tightly the anterior part of copulatory organs which are adherent to body integuments.

On the finishing section of rectum there is merely an enlargement (fig. 4). Proper caecum lacking, there are only inconspicuous wrinkles at the place where it usually occurs.

Etymology. The name is coined from the first name of the collector, i.e. Prof. ADOLF RIEDEL, a distinguished Polish malacologist (Warsaw) specializing in Zonitidae.

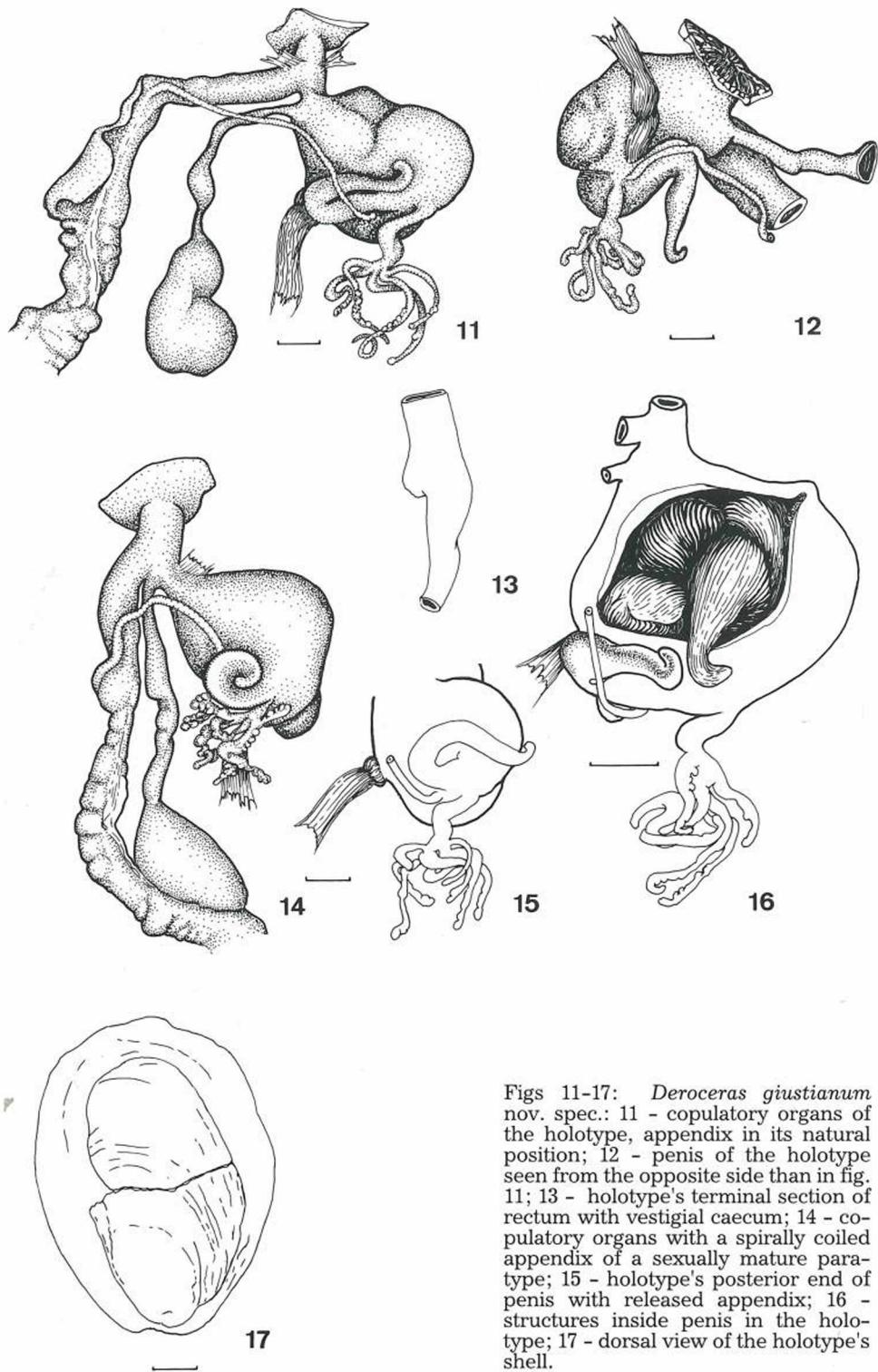
Deroceras giustianum nov. spec.

Holotypus: Sicily, Erice near Trapani, in humid brushwood on rocks below the town, north shadowed slope, leg. A. RIEDEL 12.05.1970. Mus. Nat. Hist. Wrocław Univ. no. MP 669.

Paratypes: 1 adult and 1 juv. spec. collected with the holotype (1 juv. spec. Mus. Nat. Hist. Wrocław Univ., 1 spec. Mus. Inst. Zool. PAN Warsaw).

Diagnosis. A very large evenly black slug. In the posterior section of penis two distensions and a long vermiform appendix narrowing towards the end. It is twisted or spirally coiled. Penial gland composed of a few thin unfurcate processes set on a common shaft which is apically connected with penis. Stimulator in the shape of a narrow cone. Caecum on rectum as a very shallow pocket.

Body dimensions. Length of the holotype after preservation 43 mm (the specimen is hard, so probably contracted), mantle length 16 mm, body width ca 8 mm. Body slim, its posterior section in particular. The posterior end of body turns into sole with a short nearly vertical arch (fig. 10). Keel poorly marked, or rather body is laterally flattened along $\frac{1}{3}$ of



Figs 11-17: *Deroceras giustianum* nov. spec.: 11 - copulatory organs of the holotype, appendix in its natural position; 12 - penis of the holotype seen from the opposite side than in fig. 11; 13 - holotype's terminal section of rectum with vestigial caecum; 14 - copulatory organs with a spirally coiled appendix of a sexually mature paratype; 15 - holotype's posterior end of penis with released appendix; 16 - structures inside penis in the holotype; 17 - dorsal view of the holotype's shell.

its length as measured from the posterior end. Coloration: head, mantle and the whole posterior part of body evenly deeply black, sides below mantle getting gradually lighter to reach an even white-creamy colour. The ring around pneumostom slightly lighter than the rest of mantle, brownish-blackish in colour. Lateral zones of sole blackish, the medial one creamy.

Colour of mucus unknown.

Genitalia (figs 11-12, 14-16). Penis ovaly-spherical with no medial constriction. At its posterior, dark-pigmented, end there are two distinct half-spherical distensions and a long narrow vermiform or flagelliform appendix. The latter joins penis somewhat laterally. In natural position in the holotype (fig. 11) it is folded in two and slightly hook-like curved at the end. This organ is situated between penial wall and vas deferens which is crossed with penis. In the adult paratype it is spirally coiled (fig. 14), vas deferens running below this spiral. Like the posterior part of penis, where a dark blot occurs, appendix is also dark-pigmented. In the latter organ, however, the pigment produces an indistinct streak running along the whole length. Penial gland, apically set, is composed of a distinct long common trunk divided into long, usually unbranched, processes (5 both in the holotype and the paratype). If the latter are furcate, they are short and set at the base of a long main branch. Penial gland and appendix enveloped in a thin membrane in the holotype and adult paratype. Vas deferens thin, joining penis between the base of appendix and that of penial gland. Musculus retractor penis inserts to penis laterally, but there is also an additional, narrower muscular strand, adherent to penial wall, which separates from the main insertion (fig. 12). This one reaches as far as the region of vas deferens opening. Stimulator conical, of a comparatively wide base, abruptly widening towards the loose end (fig. 16). Spermatheca oval, connected with a long narrow spermatheca duct. Both in the holotype and adult paratype there is a small enlargement in the duct, more or less in its middle, so this does not seem to be an artefact but probably a constant character.

Rectum suddenly broadens in its terminal section (fig. 13), however, a distinct caecum is lacking.

Shell as illustrated in fig. 17.

Ecology. Ecological requirements are not known in detail. The slugs were collected on a wet shadowed slope, on rocks in brushwood below a town.

Etymology. The name has been derived from that of Prof. FALCO GIUSTI DI MASSA, a remarkable Italian malacologist working in Siena, also engaged in research on slugs.

Summary

Description of two species of the genus *Deroceras* (Agriolimacidae) that differ significantly from all the other known slugs. One of them, *D. adolphi*, collected in France, has a spotted body, posterior penis with two distensions, and a very long - nearly as long as the rest of penis - tapering penial gland. It has a smooth surface, at most with a few papillae at the end. Inside penis there is a stimulator in the shape of a low cone. Rectal caecum is lacking. The other species discussed, i.e. *D. giustianum*, is a large black slug. Its penis is equipped with a thin vermiform appendix. Penial gland composed of a tuft of unbranched processes set on a common shaft. Inside penis a narrowly conical stimulator. Rectal caecum vestigial: a very shallow pocket.

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