

BULLETIN ZOOLOGISCH MUSEUM

 UNIVERSITEIT VAN AMSTERDAM

Vol. 10 No. 12 1985

ON SOME SLUGS FROM THE ISLE OF ANDROS, GREECE, INCLUDING THE DESCRIPTIONS OF TWO NEW SPECIES (GASTROPODA: PULMONATA)

A.J. de WINTER & L.J.M. BUTOT

ABSTRACT

Deroceras johannae n.sp. and *D. korthionensis* n.sp. are described from the Isle of Andros, Greece. Distributional data of *Limax* aff. *conemenosi* Boettger, *Tandonia sowerbyi* Férussac, as well as of an unidentified milacid are provided. Attention is drawn to a peculiarity in the genital anatomy of *L.* aff. *conemenosi*, in comparison with specimens attributed to this species from outside Greece. The material has been deposited in ZMA.

INTRODUCTION

Andros is the northernmost island of the Cyclades Archipelago. It was visited in April 1984 by the second author and his wife. This paper only deals with the slugs collected during this trip. The remaining landsnails will be dealt with elsewhere (Butot, in prep.).

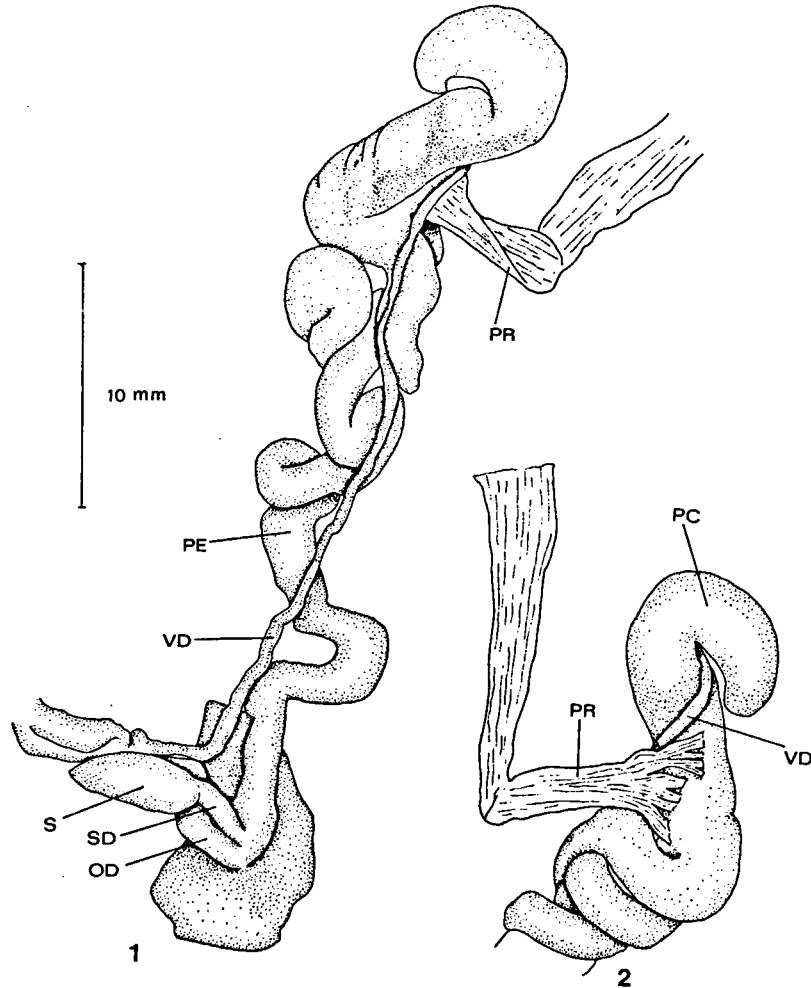
So far few authors have paid attention to the slug fauna of this island. Simroth's (1889) paper was the first and most extensive one, other authors only quoted his results (Von Martens, 1889; Wagner, 1940). Mylonas (1982) gave a summary of the malacofauna of Andros and also added some new records of slugs. Until now the following slugs have been reported: *Limax conemenosi* O. Boettger, 1882; *Deroceras berytensis* var. *andrios* (Simroth, 1889); *D. oertzeni* (Simroth, 1889); *D. thersites* (Simroth, 1886) (cf. Mylonas, 1982); *Tandonia sowerbyi* (Férussac,

1823) (cf. Simroth, 1889 as *Amalia carinata* (Risso, 1826)). In this paper we will add three more species: two *Deroceras* species, new to science, and a *Milax* or *Tandonia*, of which only juveniles were available, but which differs conspicuously from *T. sowerbyi* in external features.

We are indebted to Prof. A. Wiktor, Wrocław, Poland, for his kindness in discussing the identity of our specimens.

Live specimens were drowned in water before being preserved in alcohol 70%. All measurements have been taken from preserved material.

Abbreviations used.- A, atrium; AM, atrial muscles; APP, penial appendage; L, liver; OD, free oviduct; OT, ovotestis; P, prostate; PC, penial caecum; PE, penis; PR, penial retractor muscle; R, rectum; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden; S, spermatheca; SD, spermathecal duct; SOD, spermoviduct; VD, vas deferens; ZMA, Zoölogisch Museum Amsterdam. de



Figs. 1-2. *Limax* aff. *conemenosi* Boettger. 1, anterior genitalia; 2, apical part of penis.

LIMACIDAE

Limax (*Limax*) aff. *conemenosi*

O. Boettger, 1882

(figs. 1-2)

Material.-

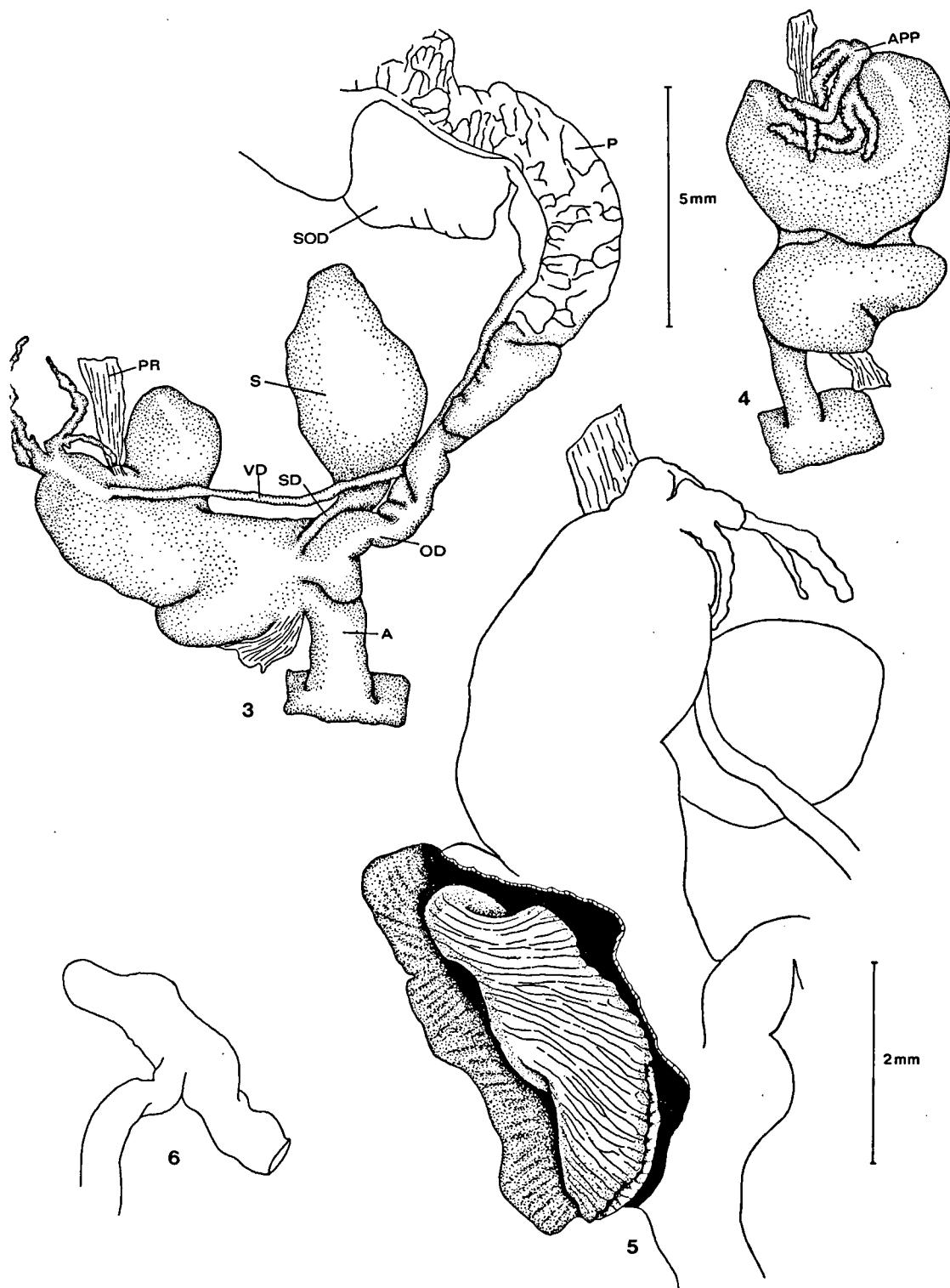
1 juvenile specimen (length 45 mm), Stavropeda (= 20 km SW of the town of Andros), under a rock; UTM LB1184; 21-IV-1984. 1 adult specimen (length 142 mm!), just outside Andros, along the road to Stavropeda, under a rock; UTM LB1890; 27-IV-1984.

Discussion.-

We hesitate to identify these specimens with *L. conemenosi*, because of the short distance between the insertion of the penial retractor muscle and the entry of the vas deferens, which is about equal to the length of the penial caecum. In nearly all published drawings of the penis of *L. conemenosi* (Urbanski & Wiktor, 1968,

fig. 3; Hudec & Vasatko, 1973, fig. 6; Rähle, 1977, fig. 2; Wiktor, 1983, fig. 63), this distance is at least twice the length of the penial caecum. Simroth (1889, fig. 8) also examined specimens from the Isle of Andros, and his drawings are in accordance with our observation. It must be stressed that, as far as we are aware, nothing has been published on the anatomy of type specimens or even topotypes of *L. conemenosi*. Boettger's original description only refers to the external characters. Except for Simroth (1889), all papers dealing with the anatomy of this species refer to Yugoslavian and Bulgarian specimens. It is therefore possible, if this feature proves to be constant, that we are dealing with two distinct although closely related (sub)species.

The length of our adult specimen (142 mm) is far larger than the maximum length ever recorded for *L. conemenosi* (80 mm, according to Wiktor, 1983).



Figs. 3-6. *Deroceras johannae* n.sp., holotype. 3, anterior genitalia; 4, penis, viewed from the other side; 5, penis opened, showing sarcobelum; 6, rectum with rectal caecum.

AGRIOLIMACIDAE

Deroceras johannae spec. nov.
(figs. 3-10)

Material.-

Holotype and two paratypes in ZMA: Moll. 385001 and 385002 respectively; two paratypes in RMNH (no. alc. 9124).

Type locality.-

Greece, Cyclades, Isle of Andros, 2 km W of Korthion, along the road to Kochylou (= 17 km SSE of Andros), under stones; UTM LB1883; 23-IV-1984.

Diagnostic features.-

A large, dark-grey *Deroceras* with a well developed rectal caecum. Penis apically with two large diverticula, one of which with a tuft of long, thin, crenulated appendages; the lower part of the penis contains a large, semicircular sarcobelum, which is folded along its long axis.

External appearance (fig. 9).-

All specimens are adults and measure between 26 and 33 mm. The holotype is 26 mm long and about 4.5 mm broad. Its mantle length is 13 mm. The mantle and dorsum are unicolourous dark-grey; the sides are gradually becoming lighter towards the sole. Around the pneumostome a lighter, slightly swollen border is present. Superficial furrows run across the dorsum and sides. The sole is cream coloured. An indistinct keel is present on the posterior end of the dorsum. There is little variation in external appearance among the available specimens.

Shell (fig. 10).-

The shell of a paratype of 31 mm measured 6.4 x 4.0 mm.

Intestine (fig. 6).-

In all specimens examined a distinct rectal caecum is present, which is about twice as long as broad.

Genital system (fig. 4-5, 7-8).-

The ovotestis consists of relatively small, very dark-brown acini, little or not at all

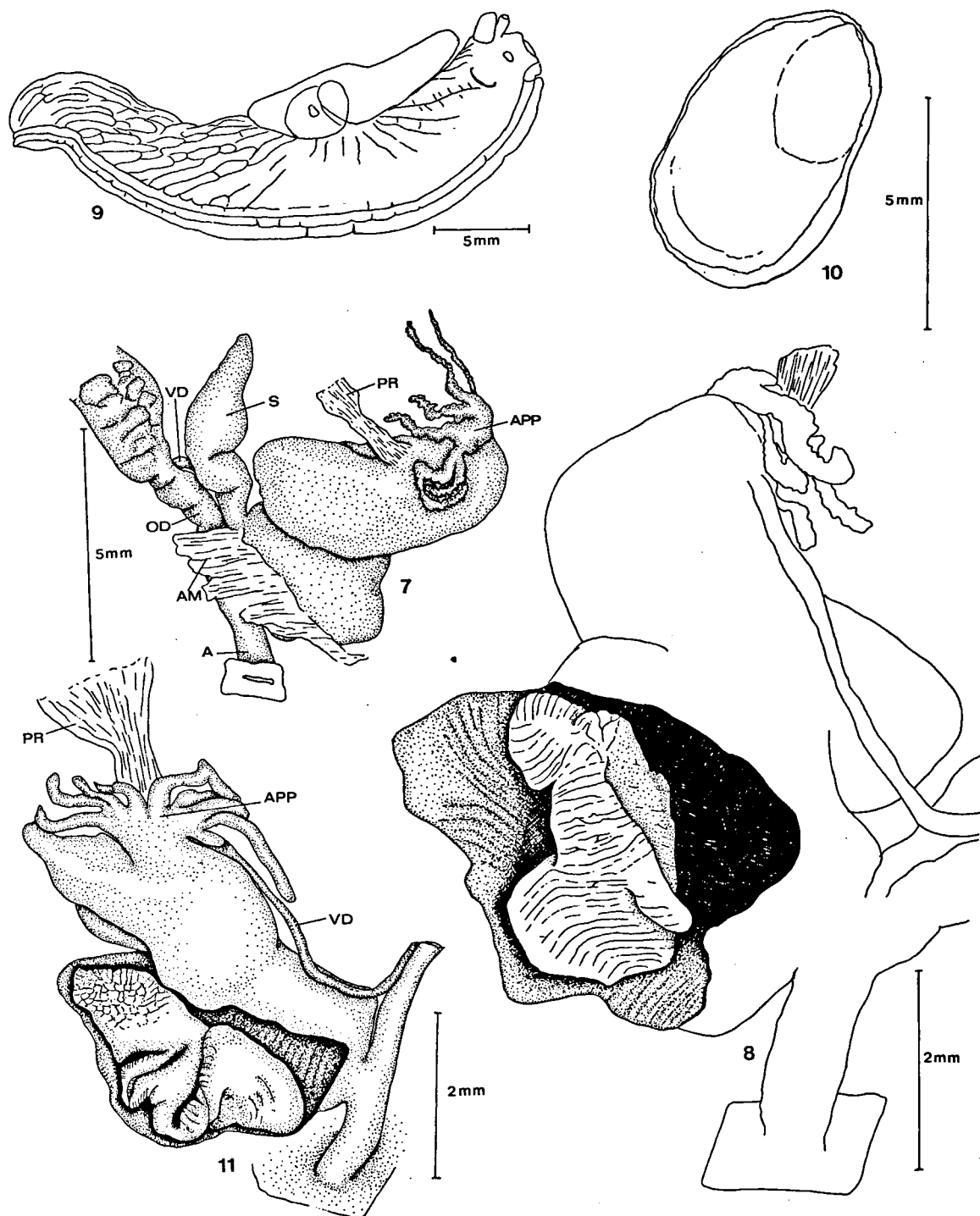
exposed. It is situated underneath the intestinal caecum, not at the rear of the body. The hermaphrodite duct is short and little sinuous. The spermoviduct and prostate are greyish-black for most of their lengths, becoming paler anteriorly. The albumen gland and anterior genitalia are cream. The spermatheca is pear-shaped, with a short, broad spermathecal duct. The penis has a lower bulbous sack, which contains the sarcobelum. The apical part of the penis is large, kidney-shaped, consisting of two diverticula of about equal size. On top of one of them a bunch of six thin, crenulated appendages are present. The vas deferens enters the penis on the same diverticulum, somewhat lower. The sarcobelum is large, flat, with a semicircular outline. In the holotype it is bound up, with a deep, narrow furrow between the two folds (fig. 5); in a paratype (fig. 8) it is somewhat irregular, with only a superficial furrow; in another paratype it is folded like in the holotype, but the folds do not lay so closely together. Between both diverticula an unbranched penial retractor muscle is inserted. The atrium is attached to the body wall by small muscles.

Derivation of name.-

D. johannae is named in honour of Mrs. J.E. Butot-Okkensen, to acknowledge her collecting efforts together with her husband. She also collected this slug.

Discussion.-

Several unicolourous dark species of *Deroceras* have been described or reported from Greece. *D. oertzeni* (Simroth, 1889) from Kowari Mountain (Oros Kouvara), Andros, seems to be smaller (according to Simroth, 1889, fig. 3, about 23 mm), and has a unicolourous grey sole. Further, it differs in having no or only a very small rectal caecum, longer, more slender penial diverticula with lateral as well as apical appendages, and in having a branched penial retractor muscle (Simroth, 1889, fig. 11). *D. thersites* (Simroth, 1886) from Piraeus near Athens has a differently shaped penis and penial appendage and is usually spotted on the dorsum and mantle (cf. Wiktor, 1983, figs. 96-101). *D. cf. andrios* sensu Reischütz, 1983b,



Figs. 7-10. *Deroceras johannae* n.sp., paratypes. 7, anterior genitalia; 8, penis opened, showing sarcobelum; 9, external appearance; 10, shell.

Fig. 11. *Deroceras keaensis* Altena, Greece, Isle of Kea, near Kea, paratype (RMNH no. alc. 9002) penis opened, showing sarcobelum.

from the Isle of Thasos has a differently shaped penis and sarcobelum and only a very short rectal caecum (Reischütz, 1983b, figs. 4-5). The same holds for *D. ikaria* Reischütz, 1983 (Reischütz, 1983a, figs. 1-5). *D. berytensis* (Bourguignat, 1852) from Beirut, Lebanon, has according to Wiktor & Mylonas (1981: 192) "an oval penis without appendix". Simroth's (1889: 15) interpretation of this species refers to a species completely different from *D. johannaea*.

Prof. A. Wiktor suggested (in litt.) that our specimens may belong to either *D. keaensis* Altena, 1973 or *D. samium* Rähle, 1983. Of both species type material (in RMNH) could be studied. *D. keaensis* from the Isle of Kea has about the same size and external appearance, as well as a similar rectal caecum and pigmentation of prostate and spermoviduct. The penis, however, has a different shape with a bunch of about ten smooth appendages apically on a short stalk. According to Altena's (1973) figure of the sarcobelum, this organ is clearly different too. His figure is somewhat misleading, however. The examination of a paratype revealed that *D. keaensis* can also possess a large, folded structure, which is, however, folded several times along its short axis (fig. 11). *D. samium* from the Isle of Samos also possesses a large sarcobelum, which is not semicircular like in *D. johannaea*. Moreover, it only has a very short rectal caecum and always two bunches of appendages on the upper part of the penis (Rähle, 1983, figs. 1-8).

Deroceras korthionensis spec. nov.
(figs. 12-16)

Material.-

Holotype in ZMA (Moll. 385003).

Type locality.-

Greece, Cyclades, Isle of Andros, 2 km W of Korthion, along the road to Kochyou (= 17 km SSE of Andros), under a stone; UTM LB1883; 23-IV-1984.

Diagnostic features.-

A small brownish *Deroceras* with black spots on the mantle and dorsum. Penis apically with

five lobate appendages and a very conspicuous papilla at the entry of the vas deferens. Sarcobelum broad, flat, with a blunt apex.

External appearance (fig. 12).-

The holotype is 18 mm long; its mantle length is 7.5 mm. Animal light brown with small dark spots on mantle and dorsum. There is a conspicuous keel present on the posterior end of the dorsum. Very superficial, hardly discernable furrows run across dorsum and sides. Sole cream.

Shell.-

Not examined.

Intestine (fig. 16).-

A clear rectal caecum is lacking.

Genital system (figs. 12-15).-

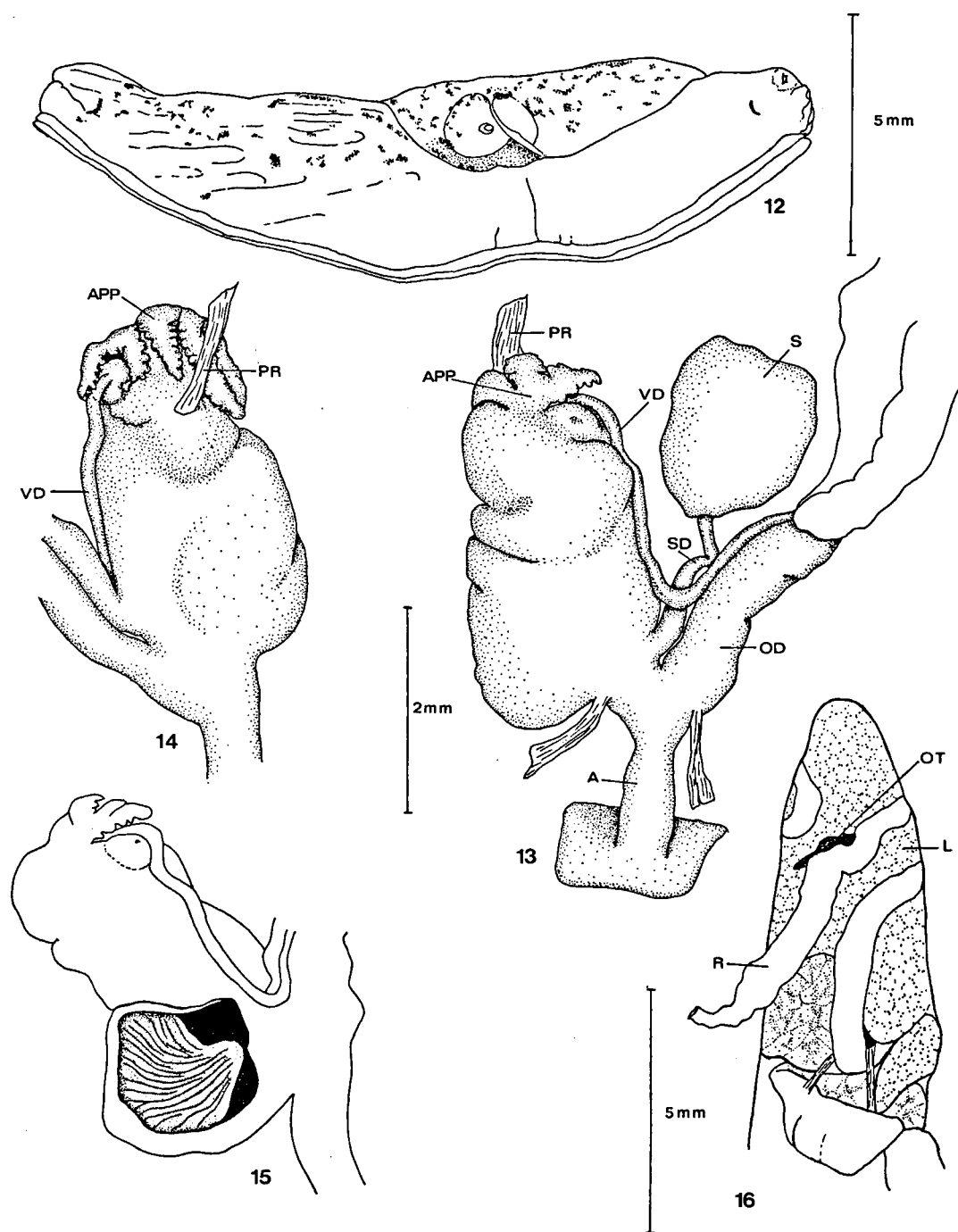
The very small, nearly black, ovotestis is situated partly under the rectum, partly exposed (fig. 16). Spermoviduct and prostate greyish. The penis consists of two parts: a lower part, which contains the sarcobelum and a cylindrical apical part, which is covered by five long, lobate appendages. On the apical part of the penis a very conspicuous papilla is present at the entry of the vas deferens. An unbranched penial retractor muscle is inserted at the upper part of the penis. The spermatheca is more or less round; the spermathecal duct is very long and slender.

Derivation of name.-

D. korthionensis is named after the village of Korthion, in the vicinity of which the holotype was found.

Discussion.-

We have tried to associate the specimen with one of the many published names. *D. korthionensis* is externally not unlike *D. pseudopanormitanum* Wiktor, 1984, from Tymfi, Nomos Joanninon, but this species differs in having a flat, tongue-like sarcobelum (cf. Wiktor, 1984, figs. 28-33). *D. cycladicum* Wiktor & Mylonas, 1981, also has a similar external appearance, but has a "flat, fan-like, asymmetrical stimulator, on



Figs. 12-16. *Deroceras korthionensis* n.sp., holotype. 12, external appearance; 13, anterior genitalia; 14, penis, viewed from the other side; 15, penis opened, showing sarcobelum; 16, posterior part of visceral mass.

one side elongate triangularly" (Wiktor & Mylonas, 1981: 191, fig. 29).

Prof. A. Wiktor, who studied some of our drawings, suggested (in litt.) that our specimens might belong to either *D. berytensis* (Bourguignat, 1852) or *D. boettgeri* (Simroth, 1889), both species of which the original description must be considered insufficient. We have, however, the following arguments that *D. korthionensis* does not belong to either of these:

- (1) According to Bourguignat (1852: 10), *D. berytensis* is black, while *D. korthionensis* is brownish with dark spots. Moreover, *D. berytensis* has "a long caecum at rectum, oval penis without appendix (and a) wide symmetrical, nearly semicircular stimulator" according to Wiktor & Mylonas (1981: 193), who studied specimens from Lebanon, which probably belong to this species.
- (2) *D. boettgeri* is similar in colour (Simroth, 1889, fig. 4), but has a slender, long saccobelum ("einen schmalen langen Reizkörper") (Simroth, 1889: 15).
- (3) In view of the tendency towards endemism on the Greek Islands (Wiktor & Mylonas, 1981; Mylonas, 1982), it is not likely, that either *D. berytensis* from Lebanon or *D. boettgeri* from Crete are conspecific with *D. korthionensis*.

For these reasons we prefer to introduce a new species although we have only one specimen at our disposal, instead of leaving such a peculiar form unnamed. More material would be very desirable to establish the variation of its characters.

Both *D. johanna*e and *D. korthionensis* have not been assigned to any of the subgenera of *Deroceras*, which are currently recognised, because these appear not to be based on synapomorphic characters, as is discussed elsewhere (De Winter, in press).

Deroceras spec.

Material.-

2 specimens (20 and 16 mm), Batsi, on stony walls (= 12 km SE of Gavrión); UTM LB0592; 24-IV-1984. 2 specimens (17 and 15 mm), spring near Pitrofós (= 14 km SW of Andros) on wet leaves; UTM LB1387; 21-IV-1984.

Remarks.-

All specimens possess very juvenile genitalia. In external appearance they resemble *D. johanna*e spec. nov.. The apical part of the penis bears two diverticula. They probably belong to either *D. oertzeni* or *D. johanna*e.

MILACIDAE

Tandonia sowerbyi (Férussac, 1823)

Limax sowerbyi Férussac, 1823. Emend. in *sowerbyi*, Opinion 336 (1955), Opinions Decl. Intern. Comm. Zool. Nomencl., 10 (3): 107. *Amalia carinata* (Risso, 1826). Simroth, 1889: 20, "Andros, vom Berge Kowari" (Oros Kouvara).

Material.-

1 specimen (length 32 mm), 2 km SE of Kolymbos, along the road to Stavropeda (= 21 km WSW of Andros) UTM LB0986; 23-IV-1984. 1 specimen (27 mm), 1 km S of Atheni (= 17 km E of Gavrión); UTM LB0795; 26-IV-1984. 1 specimen (21 mm), 2 km ESE of Remmata (= 18 km NW of Andros); UTM LB 0993; 25-IV-1984.

Milax or *Tandonia* spec.

Material.-

4 specimens (16, 18, 18 and 19 mm), Batsi, on stony walls (= 12 km SE of Gavrión); UTM LB0592; 24-IV-1984.

Remarks.-

All specimens are juveniles with only very small genitalia. They differ considerably from specimens of *Tandonia sowerbyi* of the same size, the only member of the family Milacidae so far reported from the Isle of Andros. They lack the very conspicuous keel and the mottled mantle and dorsum, present in *T. sowerbyi*. They are not unlike juveniles of *Milax gagates* (Draparnaud, 1801), i.e. greyish with a white keel on the dorsum.

REFERENCES

- ALTENA, C.O. VAN REGTEREN, 1973. Notes on land-slugs, 21. On a new species of *Deroceras* from the Island of Kéa, Greece.- *Basteria*, 37: 89-92.

- BOETTGER, O., 1882. Nacktschnecken aus Epirus und von den Jonischen Inseln.- Nachrbl. dtsh. malak. Ges., 14: 96-101.
- BOURGUIGNAT, J.R., 1852. Testacea novissima quae cl de Saulcy in itinere per orientem annis 1850 et 1851 collegit: 1-31. (Lutetia).
- HUDEC, V. & J. VASATKO, 1973. Zur Kenntnis der Molluskenfauna Bulgariens.- Acta Sc. nat. Brno, 7 (9): 1-33.
- MARTENS, E. Von, 1889. Griechische Mollusken gesammelt von Eberh. von Oertzen.- Arch. Naturgesch. Berlin 55: 169-240, Taf. 9-11.
- MYLONAS, M., 1982. The zoogeography and ecology of the terrestrial molluscs of Cyclades: 1-236. Ph. D. Thesis Univ. of Athens (in Greek, with an English summary).
- RÄHLE, W., 1977. Limaciden aus dem südlichen Jugoslawien (Gastropoda: Pulmonata).- Arch. Moll., 107 (4/6): 225-247.
- , 1983. Eine neue Deroceras-Art (Gastropoda, Pulmonata, Agriolimacidae) von der griechischen Insel Samos.- Zool. Meded. Leiden 57 (13): 115-120.
- REISCHÜTZ, P.L., 1983a. Deroceras (Plathystimulus) ikaria n.sp. von Ikaria, Griechenland (Gastropoda, Pulmonata, Agriolimacidae).- Malak. Abh. Dresden, 9 (3): 23-24.
- , 1983b. Ein Beitrag zur Molluskenfauna der Insel Thasos (Griechenland).- Ann. naturhist. Mus. Wien, 85/B: 133-146.
- SIMROTH, H., 1889. Die von Herrn E. von Oertzen in Griechenland gesammelten Nacktschnecken.- Abh. senckenb. naturf. Ges., 16: 1-29, Taf. 1.
- URBANSKI, J. & A. WIKTOR, 1968. Beiträge zur Kenntnis bulgarischer Nacktschnecken (Moll. Pulm.) (Systematische, zoogeographische und ökologische Studien über die Mollusken der Balkanhalbinsel. VIII).- Bull. Soc. Amis Sc. Lett. Poznań, (D) 8 (1967): 47-95.
- WAGNER, H., 1940. Neue Beiträge zur Kenntnis der Nacktschneckenfauna der Balkanhalbinsel, mit besonderer Berücksichtigung der griechischen Arten.- Ann. Mus. nat. Hung., (Zool.) 33: 137-152.
- WIKTOR, A., 1983. The slugs of Bulgaria (Arionidae, Milacidae, Limacidae, Agriolimacidae Gastropoda, Stylommatophora).- Ann. Zool. Warszawa, 37 (3): 71-206.
- , 1984. Six Deroceras species from Greece, new for Science (Gastropoda, Pulmonata, Agriolimacidae).- Malak. Abh. Dresden, 9 (16): 151-164.
- , & M. MYLONAS, 1981. New Deroceras species from Cyclades Islands (Greece) (Gastropoda, Pulmonata, Agriolimacidae).- Malak. Abh. Dresden, 7 (17): 183-193.
- WINTER, A.J. de, in press. A new Deroceras species from north-western Spain (Gastropoda, Pulmonata, Agriolimacidae).- Zool. Meded. Leiden.

A.J. de Winter,
Dorpsstraat 139,
6871 AG Renkum
The Netherlands.

L.J.M. Butot,
Institute for Taxonomic Zoology,
University of Amsterdam,
P.O. Box 20125,
1000 HC Amsterdam,
The Netherlands.

Received : 5.XI.1984

Distributed : 28.VI.1985