Furcopenis gen. n. with Its Two New Species and a New Deroceras Species from Spain
(Gastropoda, Pulmonata, Agriolimacidae)

With 1 Photo and 35 Figures

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Abstract. Description of a new genus closely related to Deroceras and its two species new for science as well as description of a new Deroceras species, all coming from Galicia in Spain.

Iberian area is very inaccurately examined in respect of slugs. The 19th century descriptions of slugs coming from this area had no or only fragmentary descriptions of their anatomical features. Those species require revision and the whole area requires thorough studies. Many endemics should be expected, especially within Agriolimacidae and Arionidae, which is confirmed by the present examination of a small material from this area. We owe a debt of gratitude to our colleague Professor Dario DIAZ-COSIN from Universidad de Santiago de Compostela (Galicia) for collecting for us a part of valuable material.

Types of the described species are available in the Museum of Natural History in Wroclaw, Poland (MNHW), Museo Nacional de Ciencias Naturales in Madrid (MNCN) and the private collection of J. CASTILLEJO in Santiago de Compostela (JC).

Furcopenis gen. n.

Diagnosis. Exterior, shell, pallial complex and topography of internal organs very similar to Deroceras RAF. It differs in the structure of male genitalia. Penis cylindrical having penial gland similar to that occurring in many Deroceras species. No stimulator inside penis. Penis anterior section connected with one or two accessory organs almost the size of penis having at their apical ends their own glands matted in a ball. Musculus retractor attached to the penis apical end. Branched strands of the retractor are attached to the membrane enveloping the glands of apical accessory organs.

No intestinal coecum.

Species typica: Furcopenis dariol sp. n.

Etymology. Name reflects the structure of penis which due to the presence of the accessory organs makes an impression of being divided into two or three parts.

Notes. Appurtenance of the new genus to Agriolimacidae does not raise any doubts. The exterior and the internal structure except the genitalia are deceptively similar to Deroceras. However, the specificity of the male copulatory organs departs so much from the remaining genera of Agriolimacidae that there has arisen a necessity of creating a new genus for two new species from Spain.

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Figs 1–2. Furcopenis darioi sp. n., lateral and ventral view (paratype from Bosque los Cabaninos).

**Furcopenis darioi sp. n.**

**Diagnosis.**
Penis cylindrical, corded inside with no stimulator or folds. Its anterior part connected with two identical accessory organs having longitudinal folds inside. Penial gland in form of two or three thin processes.

**Description.**
Body length of preserved specimens up to 19 mm (holotype 18 mm), mantle length up to 7 mm (holotype 5 mm). Skin thin with distinct sculpture. Body unicore (no spots), in preserved specimens light coffee with distinct pink undertone. No distinctive external features (figs 1–2).

**Genitalia** (figs. 3–9). General aspect of reproductive system and its topography as in Derceras RAP. Glandula hermaphroditica built of big acini of chocolate colour, situated under rectum and partly covered with liver lobes. Female part of oviductus darker than the male one. Free oviductus very short. Thin vas deferens opens at the apical end of penis. Penis cylindrical or claviform. At its apical end penial gland is set in form of two or three unbranched processes. They open directly to penis having their vents closely set (no joint tube for the entire gland). Internal penis surface delicately corded, so that its sculpture resembles human fingerprints. No distinct permanent folds functioning as stimulators. Penis anterior section connected with two accessory organs almost the size of penis. They connect with each other and with penis forming a joint tube opening to atrium genitale. Accessory organs have large lumen and longitudinal folds being more prominent in the anterior part of these organs (fig. 9). Inner walls and the surface of folds smooth (no cords). At apical ends of organs, glands in form of caps, differing from the remaining part of the organ in colouration and structure, enveloped in a transparent membrane. Musculus retractor penis branched into three strands. One attached to the apical end of penis near the penial gland and the opening of vas deferens, the remaining

Two attached to the membrane enveloping the glands of accessory organs. One of the paratypes has both accessory organs everted while penis has remained inside the body (figs 10–11) which indicates that accessory organs may differ from penis in their role. Most probably they function as a stimulator everted during courtship before the proper copulation. Spermatheca oval, indistinctly separated from spermatheca duct.

Alimentary tract (fig. 12) represents all characteristics peculiar to Agriolimaxidae, i.e., intestine forming two loops with the second loop reaching further to the back than the first one (see Likharev & Wiktor, 1980). No intestinal coecum.
Fig. 10. *Furcopenis darioi* sp. n., picture of specimen with everted accessory organs (paratype from Bosque los Cabaninos).

Fig. 11. *Furcopenis darioi* sp. n., schematic drawing of specimen from fig. 10.

**Radula.** Radula plates like in *Deroceras*. Formula of radula:

\[ c \ 3 \ 2 - 1 \]
\[ \ 1 \ 12 \ 15 \]
\[ \times 98 \]

Pallial complex (fig. 13) like in *Deroceras*, i.e., semilunar kidney envelopes the heart, its lobe being narrow and long and bladder oval.

**Shell** (fig. 14) similar to most Agriolimacidae.

**Material** (fig. 33).

**Holotype:** Bosque los Cabaninos, los Ancares (Galicia, UTM 29T-PH74), *Castanea sativa*, *Quercus pyrenaica*, *Ilex aquifolium*, Betula sp.-forest, 1930 m, leg. D. DIAZ-COSIN 6.12.1981 (MNHW No MP-471).

**Paratypes:** The same locality as holotype, leg. D. DIAZ-COSIN 6.12.1981 (4 spec. MNHW, 2 spec. JC, 2 spec. MNCN); leg. J. CASTILLEJO 7.12.1981 (1 spec. MNHW) and no date (3 spec. JC); leg. J. CASTILLEJO 25.05.1982 (3 juv. spec. MNHW, 6 juv. spec. MNCN, 3 juv. spec. JC) Ferreiria, El Caurel (Galicia, UTM 29T-PHS1), *Quercus pyrenaica*, *Fraxinus excelsior*, *Acer pseudoplatanus*, 1100 m, leg. J. CASTILLEJO 7.04.1977 (destroyed by preparation – see fig. 5).
Fig. 12. *Furcopenis darioi* sp. n., alimentary tract scheme. Hatched field shows the position of glandula hermaphroditica (specimen from Los Ancares).
Fig. 13. *Furcopenis darioi* sp. n., pallial complex (scheme — specimen from Bosque los Cabaninos).
Fig. 14. *Furcopenis darioi* sp. n., shell dorsal view (paratype from Bosque los Cabaninos).

Figs 15–17. *Furcopenis gallaeciensis* sp. n., dorsal, lateral and ventral view (paratype from Negeira).
Figs 18–20. Furcopenis gallaeciensis sp. n., holotype, 18 — copulative organs, 19 — penis and accessory organ, view opposite to the view on fig. 18, 20 — posterior end of penis, Ac — accessory organ, Gac — gland of accessory organ, Rp — musculus retractor penis.
**Furcopenis gallaeciensis** sp. n.

**Diagnosis.**
Penis cylindrical with smooth inside surface. Anteriorly connected with accessory organ usually bigger than penis. Glands, matted in a ball, open through little tubes to apical end of accessory organ. Inside it a dart-shaped process and a long fold attached to the wall. Penial gland in form of two or three thin appendices.

**Description.**
Preserved specimens up to 22 mm long with mantle length up to 10 mm, in holotype body length 20 mm and mantle length 6 mm. Skin thin, partly transparent showing the viscera. Skin sculpture distinct. Colouration cream tawny, darker on the dorsal side. On
Figs 22-24. *Furcopenis gallaeciensis* sp. n., 22 – reproductive system of young specimen (paratype from Monte San Mamed), 23 – reproductive system of adult specimen (paratype from Monte San Mamed), 24 – genitalia of adult specimen (paratype from Santiago de Compostela).

Fig. 25. *Furcopenis gallaeciensis* sp. n., shell of holotype.

the mantle and sporadically also on the back of some specimens blurred, very indistinct darker spots or concentrations of darker pigment (figs 15–17).

Genitalia (figs 18–23). General topography of reproductive organs similar to *Furcopenis darioi*. Penis cylindrically claviform, usually with a small pocket-shaped swelling
Fig. 26. Deroceras (Plathystimulus) hispaniensis sp. n., lateral view of holotype.

At its posterior (fig. 18). Penial gland set apically, consisting of two or three basally coadunate unbranched appendices. Inside penis walls smooth with no folds or stimulator. Penis anteriorly connected with accessory organ equal or bigger in size, the two forming as if a single branched organ. At the apical end of accessory organ a ball of glands matted in the shape of a transversely-set crescent or a cap. The glands are connected with accessory organ by numerous coiled and matted tubes. Inside accessory organ at its posterior end a dart-shaped process, the above mentioned gland tubes opening to its base (fig. 21). The role of that dart is unknown. It may function as a stimulating organ during courtship. Along the wall of accessory organ a long notched fold. Spermaphethca oval. Spermaphethca duct very thin, opening to the pit formed by the connection of penis with accessory organ. Musculus retractor penis bifurcate with one part attached to the apical end of penis, the other to the membrane enveloping the glands and their tubes opening to accessory organ. Such a bifurcation of the muscle allows for the suggestion that both the penis and the accessory organ can be everted.

Alimentary tract like in the previous species, no intestinal coecum.

Radula. It is of shape similar to F. darioi. Formula of radula:

\[
\begin{array}{cccc}
  1 & 12 & 13 & 18 \\
  3 & 2 & 1 & \times 10^7 \\
\end{array}
\]

Shell as on fig. 25.

Material (fig. 34).


Paratypes: Same data as holotype 5 specimens (2 spec. MNHW, 2 spec. MNCN, 1 spec. JC); Selva Negra (Galicia, Santiago, UTM 29T NH34) leg. J. CASTILLEJO 8.01.1981 (1 spec. JC) and 24.01.1981 (2 spec. MNHW); Monte Pedroso (Galicia, Santiago, UTM 29T-NH34) leg. J. CASTILLEJO 24.01.1982 (1 spec. MNCN); Santiago de Compostela (Galicia, UTM 29T-NH34) leg. J. CASTILLEJO 27.01.1980 (1 spec. destroyed by preparation — see fig. 24); Monte San Mamed (Galicia, UTM 29T-NH25) leg. J. CASTILLEJO 25.04.1982 (1 + 1 juv. spec. MNCN); Fiopans (Galicia, Negeira, UTM 29T-NH23) leg. J. CASTILLEJO 3.11.1981 (1 spec. JC); Negeira (Galicia, UTM 29T-NH23) leg. J. CASTILLEJO 27.11.1982 (1 spec. MNHW); Vigo (Galicia, UTM 29T-NG17) leg. J. CASTILLEJO 15.10.1981 (1 spec. MNHW).

Etymology. The name coined from the name of Gallaecia province which during the Roman times covered a bigger area than the present Galicia.
Figs 27–30. *Deroctera (Plathystimus) hispaniensis* sp. n., 27 – genitalia (paratype from Selva Negra), 28 – genitalia (holotype), 29 – view of penis opposite to the view on fig. 27, 30 – rectum (paratype from Vida).  

**Deroctera (Plathystimus) hispaniensis** sp. n.  

**Diagnosis.**  
Penis anterior section spherically swollen, posterior section cylindrical. Stimulator in form of big thin-walled U-like fold.
Description.
Body length up to 20 mm, mantle length up to 8.5 mm, body breadth up to 5 mm. Holotype dimensions: 17 mm long, mantle 7.5 mm long, body 5 mm broad. Skin thin, partly transparent. Colouration cream coffee, back slightly darker than the sides. On mantle and back minute dark spots often forming irregular concentrations (fig. 26). Individual variation of colour undertone and spot density great. Along with specimens completely light, almost coffee coloured ones are found, spots can be gray and barely visible or blackish to almost black. Tentacles in some specimens cream, in some blackish.

Genitalia (figs 27–29). Glandula hermaphroditica situated under rectum, built of big spherical acini. Penis anterior section with spherical swelling with distinctly delimited gland covered part. Penis posterior section cylindrical, its lateral part attached to spherical...
swelling so that in some positions penis seems to be bipartite (fig. 28). On penis posterior end a minute lateral appendix. Vas deferens opens at the base of appendix. Musculus retractor penis attached apically. Penial gland in the form of two or three appendices accrete at the base. In one case, probably as a result of accretion of two distal ends of two appendices, penial gland forms a loop (fig. 28). Stimulator in the penis anterior swelling, accreto the thickened part covered with glands. It has the shape of very thin membrane set in the form of letter U turned with its open end toward the penis posterior (fig. 31). It fills up almost the entire anterior section of penis and is easily damaged in preparation. In one specimen stimulator everted (fig. 32). It had the shape of oval plate with almost transparent edges, in its central part a cream slightly smaller concave area covered with delicate cords resembling human fingerprints. In all examined specimens spermatheca was not filled up yet and was narrowly oval.

Intestinal coecum missing, though there occurs a distinct distention above rectum (fig. 30).

Material (fig. 35).


Paratypes: 14 specimens collected along with holotype (5 spec. MNCN, 5 spec. JC, 4 spec. MNHW); Campus Universitaria (Galicia, Santiago, UTM 29T-NH34) leg. J. CASTILLEJO 13.10.1981 (2 spec. MNCN, 1 spec. JC, 2 spec. MNHW); Selva Negra (Galicia, Santiago, UTM 29T-NH34) leg. J. CASTILLEJO 9.10.1981 (1 spec. JC, 1 spec. MNHW).

Etymology. The name coined from the Latin name of Spain — Hispania.

Notes. MORELET (1845) described two species from Portugal belonging probably to Deroceras. One came from the vicinity of Lisbon and l'Alemteja and was named Limax
nitidus, the other came from Monchique and Braga Mountains and MORELET named it *Limax lombricoides*). Description of the former one contains no distinctive features indispensable for the determination of the slug, nor does the author give any figures concerning this species. The other description contains the information that the slug is coloured like earthworm and the description is provided with the picture of its exterior. Colouration mentioned in the description is rare in *Deroceras* but it has been acknowledged that their colouration features are deceptive. SIMROTH (1891) dealt with slugs which he identified as MORELET’s species and described the anatomy of both. It is difficult to determine whether the identification was correct. The penis of *D. hispaniensis* described in the present paper resembles a little the one on figures 15 and 16 on table 3 in SIMROTH’s work concerning *Agriolimax lombricoides sensu SIMROTH*’. However, other figures, i.e. figures 11–14 of the same slug in this work, present other features absent in our species. In the future our *D. hispaniensis* may turn out to be the synonym of either of MORELET’s species. At present, as the types whose lot is unknown and even topotypes are missing, the only proper solution is to give the new name. It is worth mentioning here that the material for MORELET’s description of *L. lombricoides* came from the northern and partly southern Portugal. According to SIMROTH the author gave one common name to two different species (SIMROTH, 1891, p. 284).

References


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3) Some authors correct the name to *lombricoides*. 

Photogr. J. Castillejo
Buchbesprechung

PFLEGER, V. & J. PRADÁČ: Krása lastur.
130 S., 93 Abb. und 24 Farbtafeln. Format 21 x 15 cm.
Academia, nakladatelství Československé akademie věd, Praha 1981. Kčs 34,–

Konchylion, besonders die großen, bizarren und teils farbenprächtigen Gehäuse der Meeresschnecken, zählen schon lange zu denjenigen Naturobjekten, die als Ziergegenstände eine weite Verbreitung gefunden haben. In den letzten Jahren hat man sie nun auch für den Büchermarkt entdeckt und nicht wenige, mit Farbtafeln ausgestattete Bände vermitteln ein Bild der Schönheit der Schalen von Weichtieren. Stand früher einfach die Form im Vordergrund, so läßt sich in den neueren Publikationen eine Hinwendung zur Vermittlung biologischer sowie kulturführlicher Fakten über diese Tiergruppe und ihre Bedeutung in der kulturellen Entwicklung einzelner Völker beobachten.

Diesem aufgezeigten doppelten Zweck will auch das hier vorliegende Buch dienen, das in seinem Umfang gegenüber anderen Werken bescheiden wirkt, dabei ja aber nicht speziell für den Fachmann gedacht ist, sondern für einen breiten Leserkreis. In acht Kapiteln werden die kulturelle und wirtschaftliche Bedeutung der Weichtiere, die verschiedenen Formen der Schalen von Schnecken und Muscheln, die Färbung und Biologie (Wachstum, Ernährung, Atmung, Vermehrung, Sinnesorgane und Umwelt) behandelt sowie etwas über das Sammeln von Mollusken ausgeführt. Eingebunden darin ist die Vorstellung von 66 Schnecken- und 14 Muschelarten, für die neben jeweils einer farbigen Abbildung, der wissenschaftliche und der tschechische Name, eine genauere Beschreibung der Schale, der Größe und der Verbreitung gegeben werden. Da auf den Tafeln die Schalen fast alle in gleicher Größe abgebildet sind, wobei z.T. kleinere nur bis 20 mm große Arten neben Großformen von 150–200 mm Durchmesser zu sehen sind, hätte man sich hier zur Vermittlung der richtigen Größenvorstellungen eine Maßstabangabe gewünscht.


D.v. KNORRE (Jena)