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**The taxonomic status of the genus *Aspidoporus* FITZINGER, 1833 and remarks on *Tandonia reuleauxi* (CLESSIN, 1887) (Mollusca, Pulmonata)**

[With 13 Text-figures]

**Abstract.** The genus *Aspidoporus* and the species *Aspidoporus limax* were based by FITZINGER (1833) on a single character, which almost certainly was an artifact. The single unquestionable syntype preserved is a juvenile specimen whose taxonomic position cannot be established. Consequently, the two above names are considered as nomina dubia. The slug described in detail (but with substantial errors) as *Aspidoporus limax* by BABOR (1898) actually is *Tandonia reuleauxi* (CLESSIN, 1887). Characteristics of this species are discussed.

INTRODUCTION

The monotypic genus *Aspidoporus* FITZINGER, 1833 and its type-species, *Aspidoporus limax* FITZINGER, 1833, have never been properly recognized because of the very superficial original description. BABOR (1898) described a slug which he believed to be *Aspidoporus limax*; the current interpretation of this species is based on BABOR'S work, however, a detailed analysis of the pertinent material and literature demonstrates that he had no real base for considering his specimens as conspecific with FITZINGER'S species.

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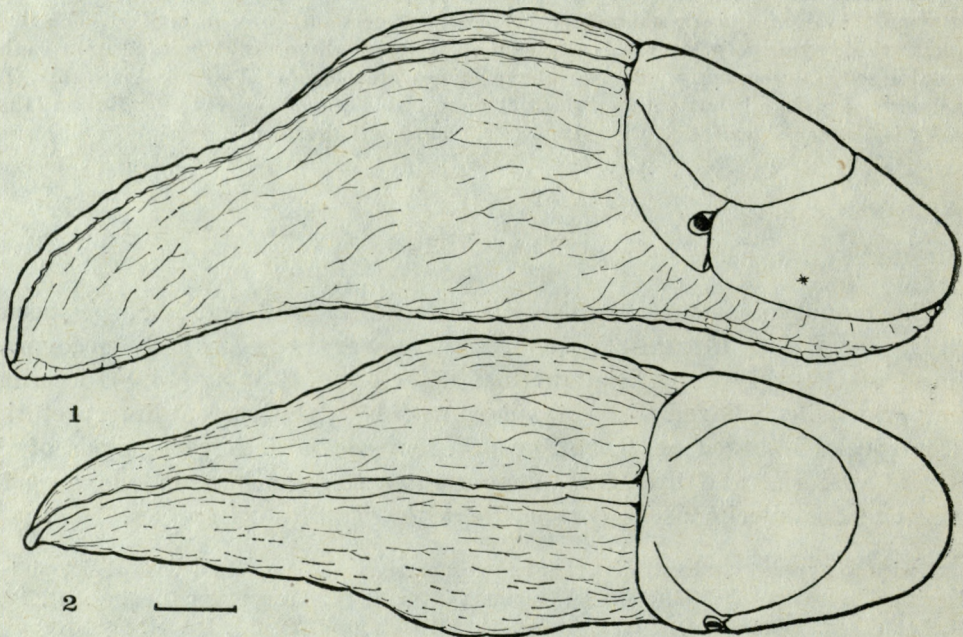
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*Aspidoporus limax* FITZINGER, 1833 and its taxonomic history

1. FITZINGER (1833) described a new slug genus and species which he called *Aspidoporus limax*. The original description, common to both taxa, is rather superficial and inaccurate, but the following significant points can be stated:

- a. a central orifice in the mantle is the only diagnostic feature mentioned,
- b. Hermanskegel in Wienerwald, Austria is the type locality (and only locality mentioned),
- c. several habitats are listed (tree trunks, under wood, under fallen leaves) which indicates that several specimens were observed.

2. HEYNEMANN (1884, 1898) examined a specimen in the Naturhistorisches Museum, Vienna, which he said represented the original material of *Aspidoporus limax*. He said that unlike the African *Urocyclus*, the orifice in the mantle of *Aspidoporus* was an artifact. He observed such an artifact twice in another slug, *Limax agrestis* L. [now *Deroceras agreste* (L.)]. He supposed that *Aspidoporus limax* might be a synonym of *Limax carinatus* FITZINGER, 1833 (which actually is a nomen nudum and a junior homonym of *Limax carinatus* RISSO, 1826).



Figs 1, 2. *Tandonia reuleauxi*, specimen from Krskak, dorsolateral aspect. The asterisk indicates the place of the sexual orifice which is hidden under the mantle. Scale: 1 mm.

3. BABOR'S (1898) study of *Aspidoporus limax* was based on his own material and also on 3 specimens said to be "authentic FITZINGER'S material revised by HEYNEMANN". Of the latter specimens only 1 had an orifice in the mantle. BABOR described the external morphology and anatomy; he also considered the orifice as an artifact. He treated *Aspidoporus* as a subgenus of *Amalia*.

4. In September 1976, Dr. O. PAGET of the Naturhistorisches Museum in Vienna, Austria, kindly sent me specimens of *Aspidoporus limax* for study. Three of these were regarded as types by BABOR. Details of these latter individuals are given below.

(1) one nondissected specimen, preserved in a separate glass, has an orifice in the mantle and thus agrees well with FITZINGER'S description. BABOR'S fig. 3 (1898: pl. I) no doubt represents this individual. It has the collection number 77433, and a very old label within the glass bears the following notes: "*Aspidoporus Limax* FITZ., Oesterreich" in a very accurate handwriting, "*Amalia carinata* FITZ.?, Deformität," in an illegible handwriting, probably by HEYNEMANN, and the latter "b" (perhaps the figure "6") in a corner. The anatomy of this specimen demonstrated that it is an immature form. The genitalia are not developed. The orifice in the mantle is obviously an artifact. The specimen does belong in the *Milacidae*, but positive identification of the taxon is impossible because it is immature.

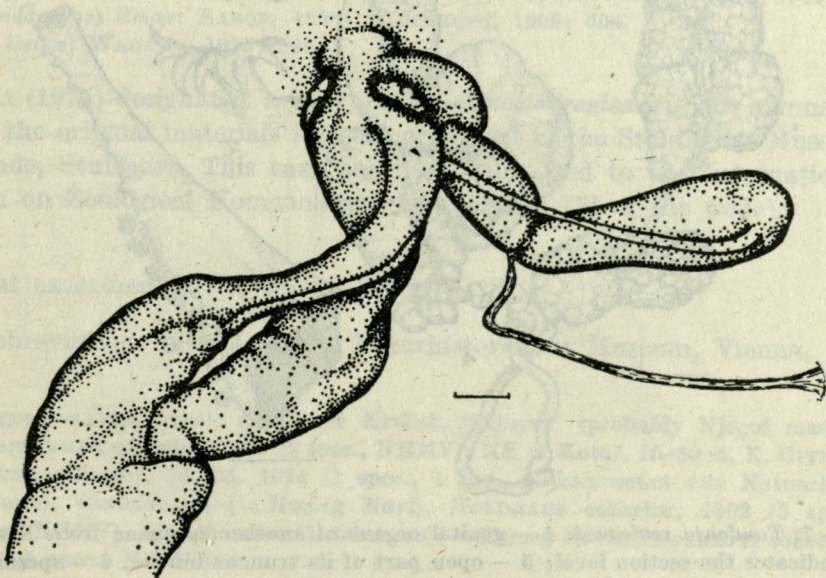
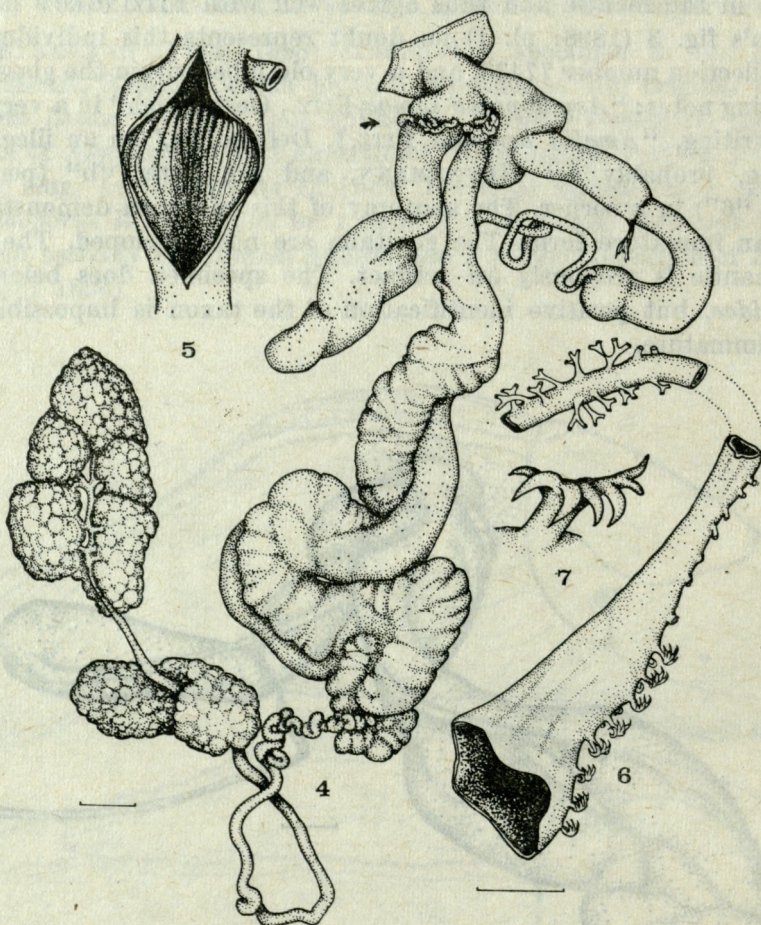


Fig. 3. *Tandonia reuleauxi*, specimen from Krskak, genital organs. Scale: 1 mm.

(2) Two dissected specimens are kept in a common glass. They apparently served as models for BABOR's figs. 2, 9 and 10 (1898: pl. I). Their mantles have no orifice, thus regarding them as FITZINGER's syntypes is questionable. The inner organs of those individuals do not correspond to BABOR's characteristics of *Aspidoporus*. According to him, there are 3 intestinal loops, and no accessory glands [these characteristics are repeated by HESSE (1926), WAGNER (1935) and others]. Actually, there are 2 intestinal loops, and small accessory glands are present on the oviduct close to atrium. These specimens are *Tandonia reuleauxi* (CLESSIN, 1887).



Figs 4 - 7. *Tandonia reuleauxi*. 4 - genital organs of another specimen from Krskak; the arrow indicates the section level; 5 - open part of its truncus bursae; 6 - spermatophore of the Kameno specimen; 7 - a crook from the broad portion of the same spermatophore. Scale: 1 mm.

5. Various taxonomic decisions may be made as result of the above facts:

(1) The specimen discussed under 4 (1) could be designated the lectotype of *Aspidoporus limax*. This would be undesirable because the specimen is immature and lacks taxonomic characters, and it cannot be assigned to any of the currently recognized European milacid genera.

(2) One of the specimens discussed under 4 (2) could be designated as the lectotype of *Aspidoporus limax*. This solution is no good either, because there is no evidence that are really syntypes. Besides, this solution constitutes a threat to the well established generic name *Tandonia* LESSONA et POLLONERA, 1882, and even to *Milax* GRAY, 1855 (if *Tandonia* is considered as subgenus of the latter, which is a common practice). It must be remembered here that *Milax* is one of the most commonly used generic names in slugs with many hundreds citations, and that the family name *Milacidae* is based on it.

(3) *Aspidoporus* FITZINGER, 1833 and *Aspidoporus limax* FITZINGER, 1833 could be considered as nomina dubia. This solution seems to be the best one, and it is adopted here.

*Tandonia reuleauxi* (CLESSIN, 1887)

*Amalia Reuleauxi* CLESSIN, 1887: 46. Syntypes: Yugoslavia, Montenegro and Dalmatia (one shell in Staatliches Museum für Naturkunde, Stuttgart). Neotype: Yugoslavia, Kotor (Rijksmuseum van Natuurlijke Historie, Leiden), designated by ALTENA, 1975: 18. In *Milax*: WAGNER, 1929: 335; 1930: 40; 1931: 61, 68; 1935: 201; ALTENA, 1975: 18.  
*Amalia (Aspidoporus) limax*: BABOR, 1898: 3; SIMROTH, 1909: 604.  
*Aspidoporus limax*: WAGNER, 1935: 201.

ALTENA (1975) designated a neotype for *Amalia reuleauxi*, but remnants (a shell) of the original materials are still preserved in the Staatliches Museum für Tierkunde, Stuttgart. This case has been submitted to the International Commission on Zoological Nomenclature (see Article 75f of the Code).

Material examined

The abbreviation NHMV means Naturhistorisches Museum, Vienna.

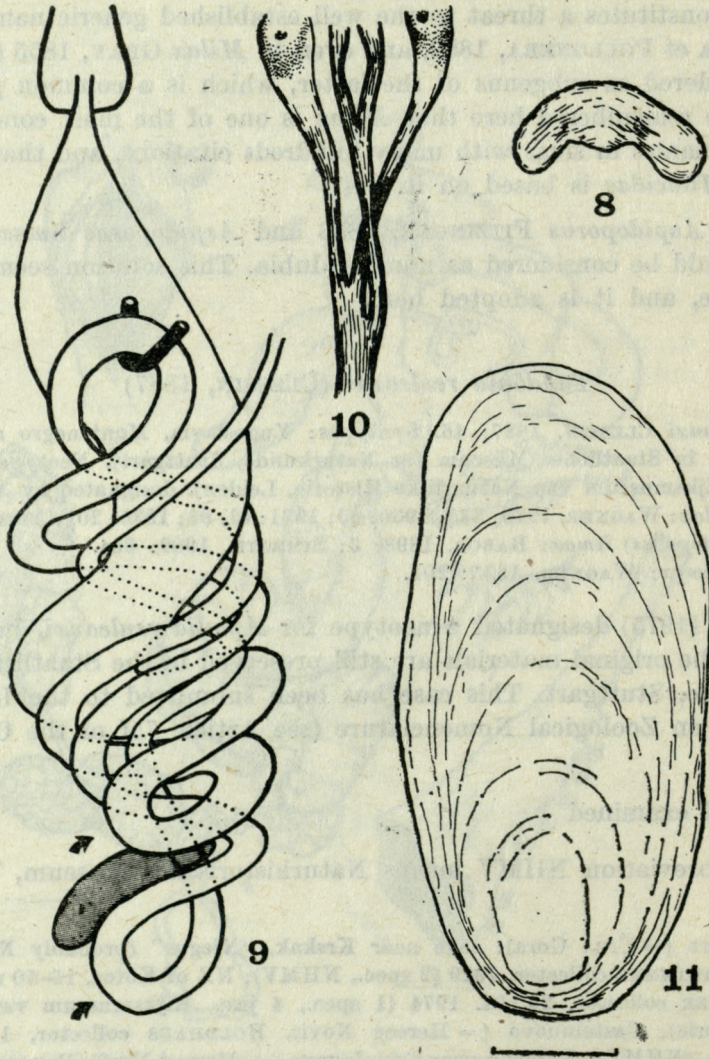
Yugoslavia:

Montenegro (= Črna Gora): cave near Krskak, "Njegus" (probably Njekoš massif), OBERWIMMER collector, 1929 (2 spec., NHMV); NE of Kotor, 15-50 m, E. GITTENBERGER collector, 26. 04. 1974 (1 spec., 4 juv., Rijksmuseum van Natuurlijke Historie); Castelnovo (= Herceg Novi), HOLDHAUS collector, 1902 (3 spec., 2 juv., NHMV); Kamenó near Castelnovo (= Herzeg Novi), PAGANETTI collector, 1902 (8 spec., NHMV).  
 Hercegovina: Plasa near Jablanica, PENTHER collector, 1900 (1 spec., 11 juv., NHMV); Tisavica, Prenj-Planina, STURANY collector, 1898 (1 spec., 1 juv., NHMV).

Also: "Österreich", collector unknown (2 spec., NHMV). These specimens may have been collected in Yugoslavia part of which belonged to Austria-Hungary before the World War I.

### Description

Body length somewhat less than given by ALTENA (1975). Fully grown, fixed, not contracted specimens are 53 mm long, 10–13 mm wide; length of mantle 20 mm. Some specimens of the same length had immature genitalia.



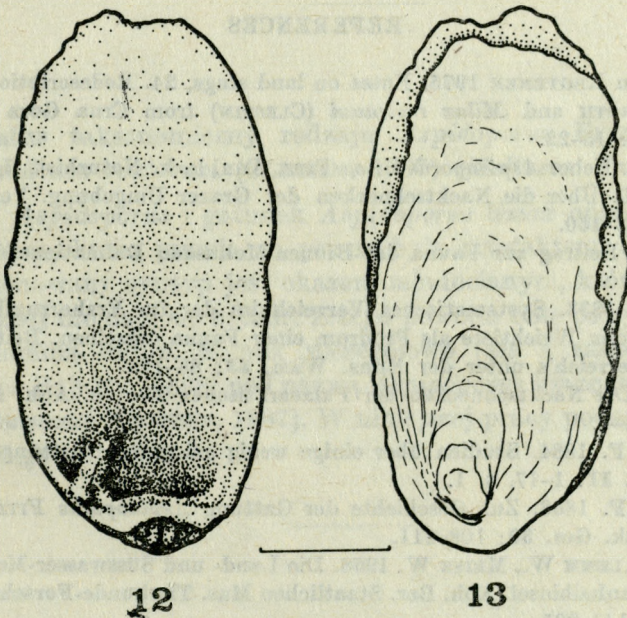
Figs 8–11. *Tandonia reuleauxi*. 8 – jaw, Kameno specimen; 9 – alimentary tract, same specimen; 10 – musculus retractor columellaris, same specimen; 11 – shell, Krskak specimen. Scale: 1 mm.

Some strongly contracted specimens with mature genitalia are 35 mm long. Body relatively stout (figs. 1-2). Keel weakly convex, covering whole dorsum, reaching mantle.

Mantle groove well defined, forming an almost complete circle. There are 12-15 rows of wrinkles between keel and pneumostome.

Mantle and dorsum (including keel) uniformly black, sides somewhat clearer, but with dark pigment reaching edge of foot. Head and optic tentacles blackish. Sole cream-white, but blackish laterally in some specimens.

Genitalia: figs 3-4. Vas deferens opening into epiphallus asymmetrically on its end. Epiphallus cylindrical, slightly broadening distad, separated from penis by slight narrowing. Musculus retractor penis long, very narrow, attached to inner wall of narrowing. Penis consisting of two parts: cylindrical posterior one which is similar in length and diameter to epiphallus, and irregularly shaped, short, much wider anterior one; the latter contains a small papilla. Oviduct subequal in length to epiphallus. Bursa copulatrix with elongate container which is obtuse caudally. Truncus bursae about as long as container, widening anterod, with thick, muscular walls, with penial papilla looking sphincter inside the thickest part (fig. 5). Vagina very short. Accessory glands opening into female tract, like in other *Tandonia*, but much smaller than in other species of this genus. BABOR (1898) overlooked them, though they are present in the specimens he studied. Atrium also unusually small.



Figs 12, 13. *Tandonia reuleauxi*, shell of a syntype from Stuttgart Museum. 12 - ventral view; 13 - dorsal view.

Spermatophore (figs. 6–7) partly decomposed in specimens studied, consisting of two parts: filiform one and broad one (the latter one being filled with sperm). Filiform part covered with dichotomically branched spines; broad part covered with multiply branching crooks.

Jaw: fig. 8. Radula with formula C.15.44/x 111.

Alimentary tract (fig. 9) consisting of two loops which are strongly twisted around body axis (BABOR, 1898 erroneously admitted the presence of 3 loops). Ototestis situated at apical end of second loop.

Musculus columellaris and shell: figs. 11–13.

Ecology unknown. The undigested particles found within the alimentary tract of one specimen probably are ant cocoons.

Geographical distribution. Several specimens (NHMV) determined as *Aspidoporus limax* in the sense of BABOR actually belong to other species or even families (including the specimens from Adelsberg, Kraina cited by WAGNER, 1931). Currently *Tandonia reuleauwi* is known only from a small area in southern Yugoslavia. Its range extends from southern Velebit to Kotor Golf along the coast, and to the locality Jablanica in Dynar Mts. on the mainland. The specimens labelled "Österreich" (NHMV) probably originate from Yugoslavia which partly belonged to Austria-Hungary in the XIXth century.

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STRESZCZENIE

[Tytuł: Status taksonomiczny rodzaju *Aspidoporus* FITZINGER, 1833 oraz uwagi o *Tandonia reuleauxi* (CLESSIN, 1887) (*Mollusca*, *Pulmonata*)]

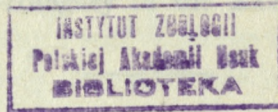
Rodzaj *Aspidoporus* i gatunek *Aspidoporus limax* oparł FITZINGER (1833) na jednej cesze, która prawie na pewno była artefaktem. Jedyne zachowane i nie kwestionowane syntypy są okazami młodocianymi, którego przynależności taksonomicznej nie daje się ustalić. Z tego powodu obie powyższe nazwy uważa autor za nomina dubia. Ślimak szczegółowo (ale z zasadniczymi błędami) opisany przez BABORA (1898) pod nazwą *Aspidoporus limax* jest w rzeczywistości *Tandonia reuleauxi* (CLESSIN, 1887). W niniejszej pracy podano charakterystykę tego ostatniego gatunku.

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## РЕЗЮМЕ

Заглавие: Таксономическое положение рода *Aspidoporus* FITZINGER, 1833 и замечания относительно *Tandonia reuleauxi* (CLESSIN, 1887) (*Mollusca, Pulmonata*)]

Род *Aspidoporus* и вид *Aspidoporus limax* FITZINGER, 1833 был основан на одном лишь признаке, который по всей вероятности был артефактом. Единственный сохранившийся и не подлежащий сомнению синтип является ювенальной особью, таксономической принадлежности которой невозможно установить. В связи с этим оба выше указанные названия автор считает *nomina dubia*. Моллюск описанный подробно (но с принципиальными ошибками) Бабором (BAVOR, 1898), под названием *Aspidoporus limax* в действительности является *Tandonia reuleauxi* (CLESSIN, 1887). В настоящей работе приводится характеристика последнего вида.



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