

DESCRIPTION OF A NEW SPECIES OF NUDIBRANCHIATE MOLLUSCA,
PARADORIS TSURUGENSIS, DORIDIDAE, FROM JAPAN

KIKUTARÔ BABA

Shigigaoka 35, Minami-11-jyo ,
Sango-cho, Ikoma-gun, Nara-ken,
Japan. (recebido em 1.VIII.1985)

RESUMO - **Paradoris** Bergh, 1884 (tipo: **P. granulata** Bergh, 1884) é um gênero raro no Mediterrâneo (Trieste) Sua ocorrência é indicada no Japão e uma nova espécie, **P. tsurugensis**, é descrita.

ABSTRACT - **Paradoris** Bergh, 1884 (type: **P. granulata** Bergh, 1884) is a rare genus of the Mediterranean Sea (Trieste) It is reported to occur in Japan, and a new species, **P. tsurugensis**, is described.

INTRODUCTION

The systematic location of the genus **Paradoris** Bergh, 1884, among the subfamilies of the family Dorididae, differed greatly according to authors (cf. Marcus, 1976:20, see also the synonymy of the genus in this paper

Paradoris granulata Bergh, 1884, the type of the genus is most prominently characterized by (1) the grooved oral tentacles, (2) the tripartite labial armature of two lateral and one ventral pieces, and (3) the genital accessories which consist of three stylets (= darts) and four to five vestibular glands.

In 1976, another genus, **Percunas** Marcus, 1970, from Brazil, was synonymized with **Paradoris** by Marcus, with some reservations. **Percunas mulciber** Marcus, 1970, the type of the genus, differed from **Paradoris granulata** Bergh, 1884 in the possession of three stylets plus multiple vestibular glands, and in the shape of the labial armature (cf. Marcus, 1970:945-947, figs. 45-49 for **Percunas mulciber**; and 1976:18-20, figs. 10-14 for **Paradoris mulciber**).

The present paper treats **Paradoris tsurugensis** n.sp. especially in comparison with the type of the genus, **P. granulata** Bergh, 1884.

TAXONOMY OF MATERIAL

Genus *Paradoris* Bergh, 1884

Paradoris Bergh, 1884:686 (Doridinae); Bergh, 1891:131 (Discodoridinae); Odhner, 1926:54 (Arginae); Thiele, 1931:439 (Arginae); Pruvot-Fol, 1954:275-276 (subfamily questioned); Odhner in Franc, 1968:870 (Baptodoridinae).

Type: *P. granulata* Bergh, 1884. - Mediterranean Sea.

Percunas Marcus, 1970:945 (Discodoridinae).

Type: *P. mulciber* Marcus, 1970. - Brazil.

Paradoris tsurugensis n. sp.

(Tsuruga-umiushi, or Tsuruga Doris, n. n.)

(Figs. 1 to 3)

Species especially compared with:

Paradoris granulata Bergh, 1884:686-691, pl. 76 figs. 10-24. - Trieste; Pruvot-Fol, 1951:19; Pruvot-Fol, 1954:276-277. fig. 111, c-i. - Trieste.

Paradoris granulata var Bergh, 1884:691-693, pl. 76, figs. 25-32. - Trieste.

Material collected:

Sp. № 1. One specimen (main material for description, the type), collected by the members of the Takaoka Biological Club from Okazaki, Tsuruga Bay (35°44'N; 136°5'E) July 31, 1961; length 50 mm alive.

Sp. № 2. One specimen (not dissected) collected by the members of the Takaoka Biological Club from Ogi, Toyama Bay (37°18'N; 137°18'E), July 30, 1962; length 40 mm alive.

Sp. № 3. One specimen (record only) collected by me from Tomioka, Amakusa (32°31'N; 130°2'E) May 1, 1940; length 30 mm alive.

DESCRIPTION

The body (Fig. 1A) is rather broad, elliptical, depressed, and leathery in consistency. The back is covered with granular tubercles of various sizes. The spicules in the integument tend to stand together to support the larger tubercles (Fig. 1D, z). The underside of the animal is smooth. The margin of the rhinophoral opening is entire. The gills consist of 6, tri- or quadripinnate plumes. The margin of the branchial opening is also entire. The oral tentacles are digitate when alive (or they may be triangular when preserved) and grooved ventrally. The upper lip of the anterior foot-margin is notched medially (Fig. 1B).

The ground-color of the back is faintly grayish yellow in Sp. № 1 and Sp. № 3 and grayish brown in Sp. № 2. It is always scattered with a small number of blackish brown flecks (Fig. 1A). On closer observation there may be seen a

narrow line of chocolate brown dots around the base of the larger tubercles (Fig. 1C, y). The upper half of the rhinophore is chocolate brown. The branchial plumes are grayish yellow to grayish brown. The underside of the mantle and the sole are white closely covered with chocolate spots (Fig. 1B)

The main part of the digestive system and particularly its pharyngeal region are shown in Fig. 2, A and B. It is especially to be noted that the labial armature (Fig. 2C) is formed of three pieces (two lateral and one ventral) Their elements are simply rod-like (Fig. 2C, rd). The labial armature if present in the genera of the Dorididae (e.g. *Discodoris* Bergh, 1877, etc.) usually consists of two lateral pieces.

It is also remarkable that the radula (Fig. 2D) forms an exceedingly elongated and narrow ribbon, the sac of which being extended behind the posterior end of the pharynx (Figs. 2A and 2B, rs). The radular formula is about $90 \times 20 - 25.0.20 - 25$. All the lateral teeth including the outermost ones are simply hamate without denticulations (Fig. 2E)

The main mass of the genital system is analyzed in Fig. 3A. The prostate (Fig. 3A, pr) is large and massive as in *Discodoris* (see above), *Platydoris* Bergh, 1877 (= *Argus* Bohadsch, 1761) and some others. The distal part of the vas deferens (Figs. 3A and 3B, vd) does not appear to be specialized into a penial papilla. It is unarmed. There are two vestibular glands (Fig. 3C, g) and two stylets (Fig. 3C, s) belonging to the genital atrium. Each stylet measures about 1 mm in length.

REMARKS

Paradoris tsurugensis n. sp. is most closely allied to *P. granulata* Bergh, 1884 in the external morphology (e.g. granulated back and grooved oral tentacles), body-colors (except for the absence of the blackish brown flecks on the back of the latter species), and the internal morphology of such organs as the labial armature and radular teeth. However, the two species are separated from each other by the different characters of the genital accessories as shown below:

1. *P. tsurugensis* n. sp.: two vestibular glands and two stylets.
2. *P. granulata*: Four to five vestibular glands and three stylets (Bergh, 1884:693, pl. 76, figs. 28-32)

The systematic position of the genus *Paradoris* in the family Dorididae is still unsettled.

Acknowledgments - I thank the members of the Takaoka Biological Club for collecting specimens for identification. I thank also Dr Eveline du Bois-Reymond Marcus of the Universidade de São Paulo for critically reading the manuscript and providing the xerox copy of Bergh's 1884 description of *Paradoris*.

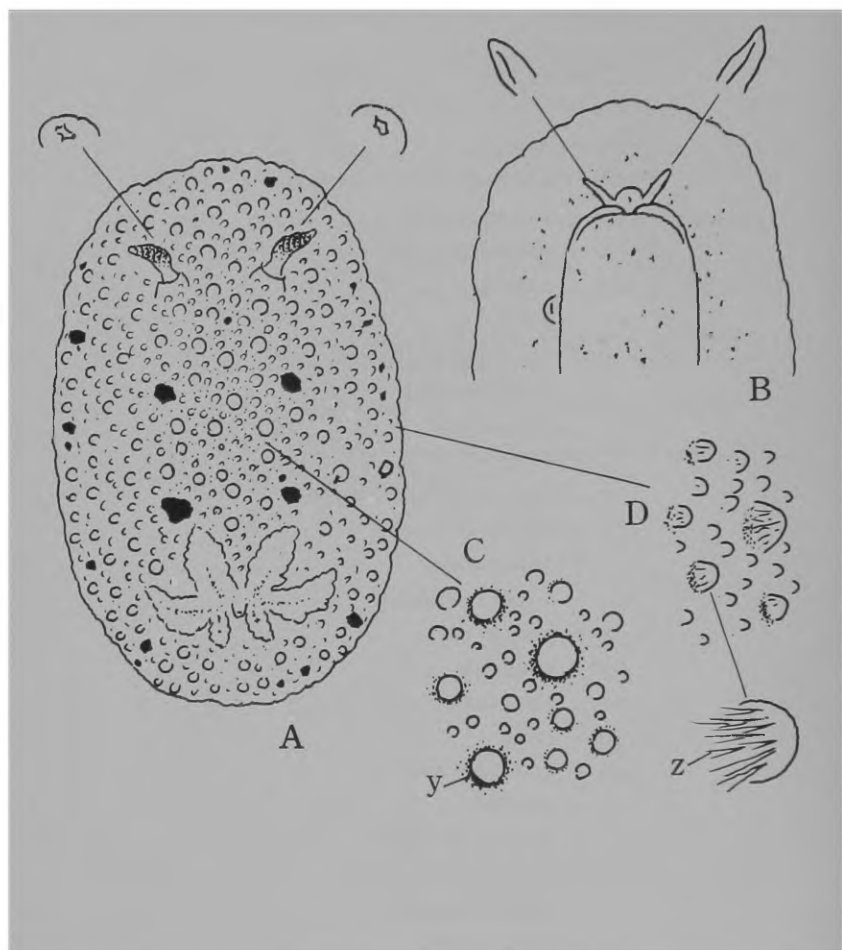
REFERENCES

- BERGH, R.S. 1884. Malacologische Untersuchungen, in: **Reisen im Archipel der Philippinen**(ed. by C. Semper), 2(15):647-754, pls. 69-76.
- BERGH, R.S. 1891. Die cryptobranchiaten Dorididen. **Zool. Jahrb.Abt.Syst.**, 6(1):103-144.
- MARCUS, E. 1970. Opisthobranchs from northern Brazil. **Bull. mar.Sci.**, 20(4):922-951.
- MARCUS, E. 1976. Marine euthyneuran gastropods from Brazil (3) **Studies on Neotropical Fauna and Environment**, 11:5 - 23.
- ODHNER, N.H. 1926. Die Opisthobranchien. **Further Zoological Res.Swed.Antarctic Exped.** 1901-1903,2(1):1-100, pls. 1-3.
- ODHNER, N.H. 1968. Opisthobranches, in: Franc, André, Gastéropodes (ed. by P. Grassé) **Traité de Zoologie**, 5(3):834-893. Masson & Cie, Paris.
- PRUVOT-FOL, A. 1951. Étude des nudibranches de la Méditerranée, 2e. partie. **Arch. de Zool.Exp. et Gén.** 88(1):1-80 , pls. 1-4.
- PRUVOT-FOL, A. 1954. Mollusques Opisthobranches. **Faune de France**, 58:1-460, pl. 1.Paul Lechevalier Paris.
- THIELE, J 1931. **Handbuch der systematischen Weichtierkunde.** II:377-778. Gustav Fischer, Jena.

Lettering:

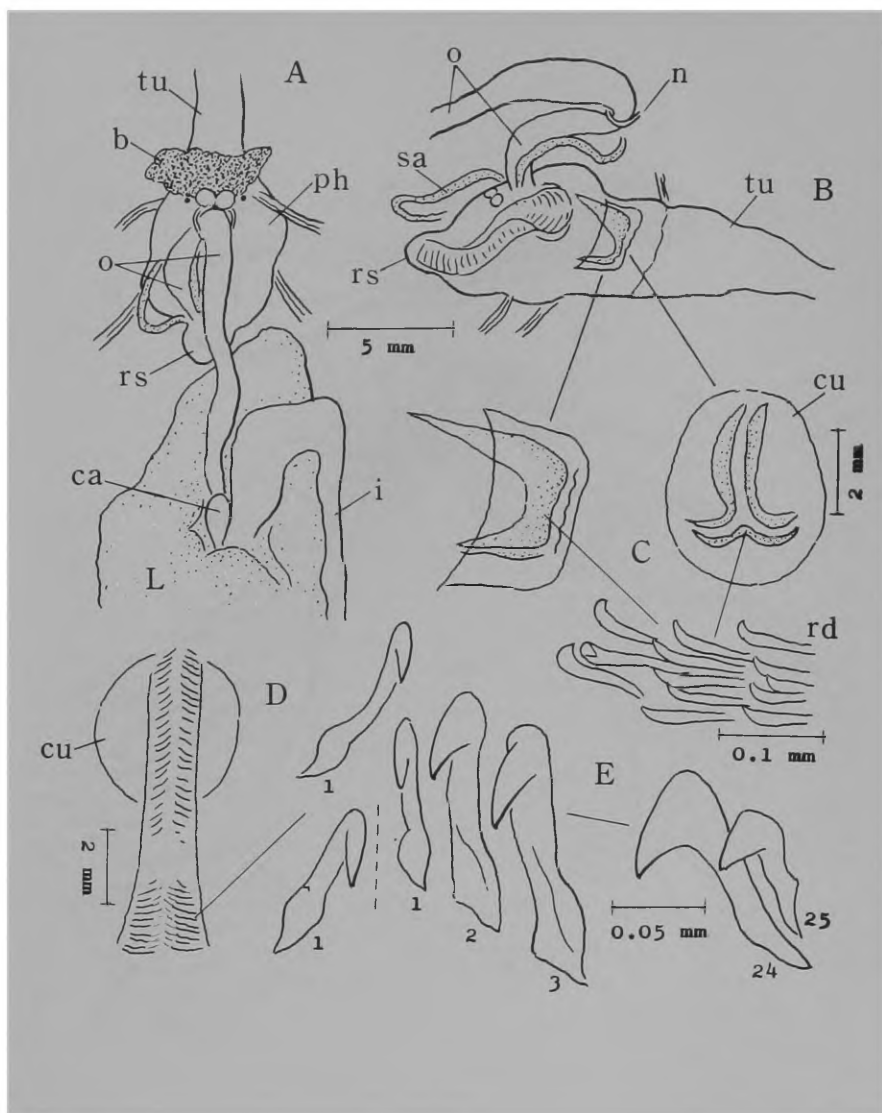
- a - ampulla
- at - atrium
- b - blood gland
- c - spermatocyst
- ca - caecum
- cu - cuticle
- g - vestibular gland
- h - hermaphrodite duct
- i - intestine
- L - liver
- m - female gland mass
- n - nerve collar
- o - oesophagus
- ov - outer oviduct
- p - penis
- ph - pharynx
- pr - prostate
- rd - rods
- rs - radular sac
- s - stylet
- sa - salivary gland
- sh - sheath of stylet
- t - spermatheca
- tu - oral tube
- v - vagina
- vd - vas deferens
- y - chocolate brown dots
- z - spicules

Fig. 1



Baba

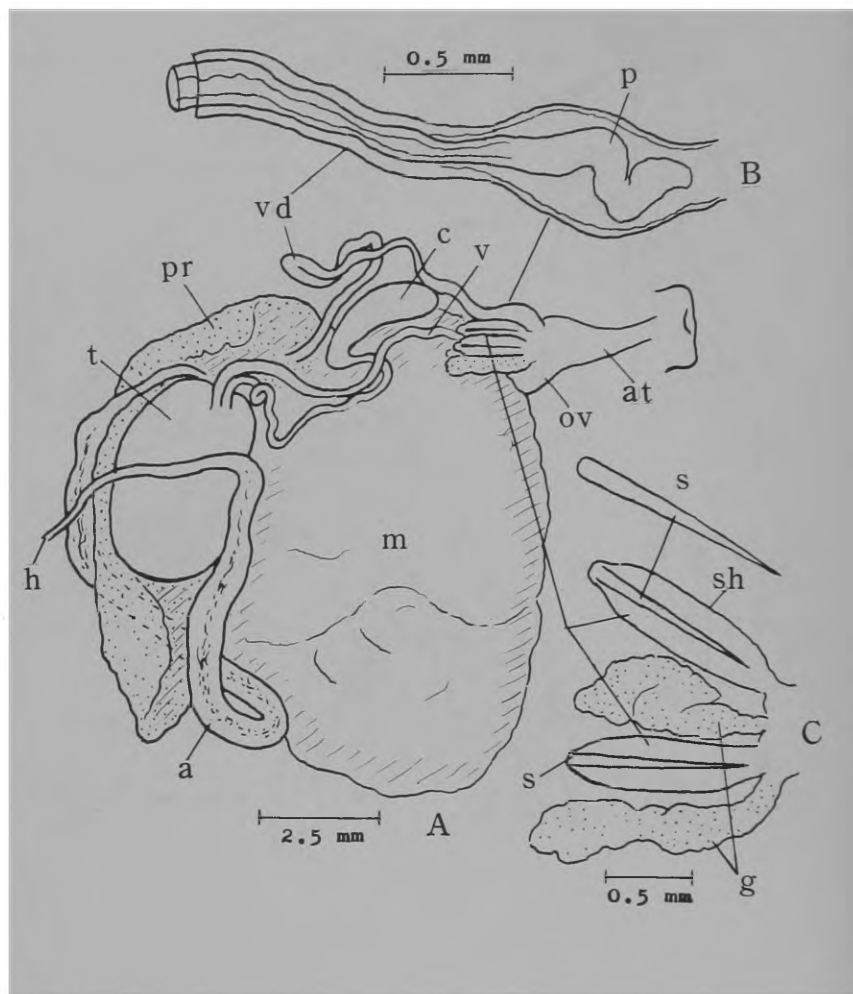
Figure 1 *Paradoris tsurugensis* n. sp. Sp. No 1. Living animal from dorsal (A) and ventral (B) sides. Length 50 mm. C and D. Granular tubercles on the central part and near the margin of the mantle.



Baba

Figure 2. *Paradoris tsurugensis* n. sp. Sp. № 1. A. Anterior half of the digestive system from above; B. Lateral view of the oral tube and pharynx; C. Labial armature in lateral and frontal views, and the elements; D. Radular ribbon; E. A right half-row of the radula.

Fig. 3



Baba

Figure 3. *Paradoris tsurugensis* n. sp. Sp. No 1. A. Main mass of the genital system from above (insemination duct not traced); B. Distal part of the male duct; C. Genital accessories.