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A new species of dorid nudibranch of the genus *Taringa* Marcus, 1955 (Mollusca: Opisthobranchia) from the southern Iberian peninsula, with remarks on world species of the genus

J. C. GARCÍA-GÓMEZ, J. L. CERVERA† and S. F. GARCÍA-MARTIN†

Laboratorio de Biología Marina, Departamento de Fisiología y Biología Animal, Facultad de Biología, Universidad de Sevilla, Apdo. 1095, 41080 Seville, Spain

† *Departamento de Biología Animal, Vegetal y Ecología, Facultad de Ciencias del Mar, Universidad de Cádiz, Apdo. 40, 11510 Puerto Real (Cádiz), Spain*

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A new dorid nudibranch from the southern Iberian peninsula is described. *Taringa tarifaensis* n. sp. is subtidal and has been found under stones. A comparison between *T. tarifaensis* and the other known species of the genus is presented, as well as some remarks on the taxonomic status of the genus *Taringa*.

KEYWORDS: Gastropoda, Opisthobranchia, Nudibranchia, *Taringa*, taxonomy, Strait of Gibraltar.

Introduction

Ten species of *Taringa* Marcus, 1955 have so far been considered valid. Of these species, *Taringa faba* Ballesteros, Llera and Ortea, 1984 is the only one described from Iberian Mediterranean coasts. *Taringa armata* Swennen, 1961 and *T. pinoi* Perrone, 1985 are the other two Mediterranean species. Ortea *et al.* (1982) described four new species of *Taringa* from the Canary Islands: *viz. T. oleica, T. ascitica, T. tritorquis* and *T. bacalladoi*, and transferred the Senegalese species *Thordisa souriei* Pruvot-Fol, 1953 to this genus. The remaining species in the genus are from the western Atlantic (Brazil, Florida) or Pacific (Panama, California).

Recently, we have found two individuals of an undescribed species of *Taringa* on the Iberian coasts of the Strait of Gibraltar, which we describe in this paper.

Material

Type locality: Tarifa (Cádiz, Strait of Gibraltar, 36°48″N; 5°36′W): 2 individuals, 27 and 23 mm body length (April 1992), collected at 5 m depth under stones. The smaller is here designated as holotype. It has been deposited in the Canadian Museum of Nature (reference number CMN: 92950). Colour transparencies of the living entity are on file at the Laboratorio de Biología Marina, Departamento de Fisiología y Biología Animal, Universidad de Sevilla.

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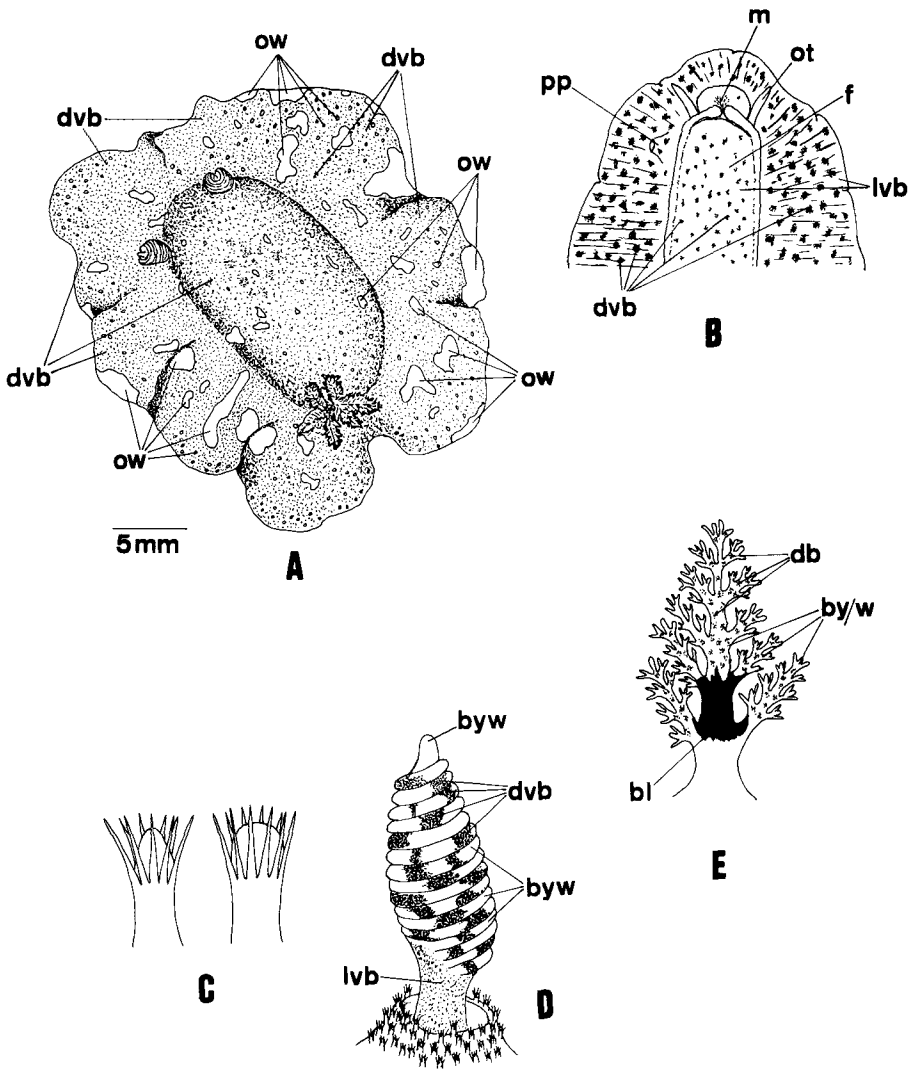

FIG. 1. *Taringa tarifaensis* n. sp. **A**, dorsal view; **B**, ventral view; **C**, detail of the mantle tubercles; **D**, rhinophore; **E**, gill. bl, Black; byw, brilliant yellowish white; by/w, brilliant yellowish/whitish; db, dark brown; dvb, dark violet brown; f, foot; lvb, light violet brown; m, mouth; ot, oral tentacles; ow, opaque white; pp, penial papilla.

Results

Order **NUDIBRANCHIA** Blainville, 1814
Suborder **DORIDACEA** Odhner, 1934
Family **PLATYDORIDIDAE** Bergh, 1891
Genus *Taringa* Marcus, 1955
Taringa tarifaensis n. sp.

Description

The body is oval, flat and spiculose (Fig. 1 A, B). The mantle and the rhinophoral sheaths are covered by caryophyllidia tubercles similar in size and regularly and tightly arranged. These have tips more or less rounded and encircled by the projecting spicules

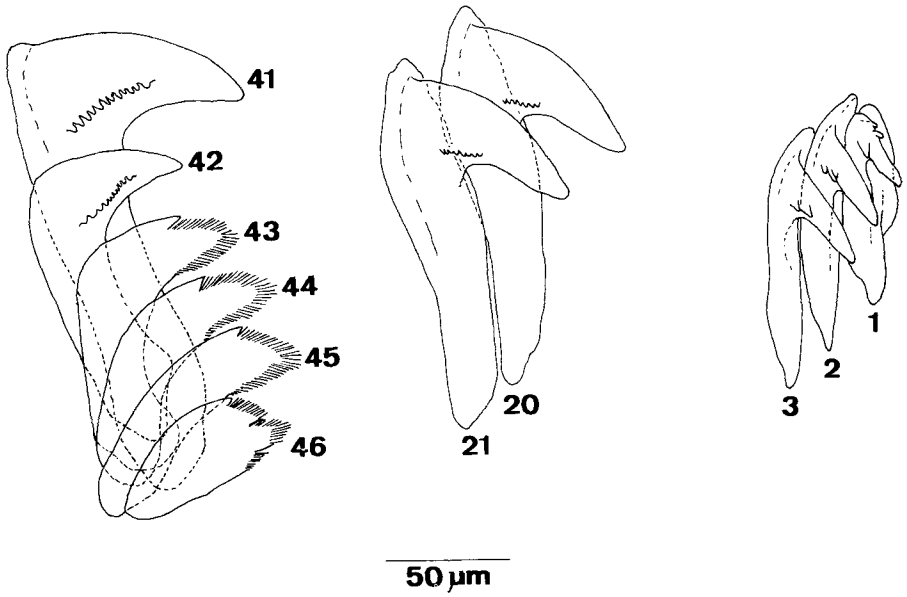

FIG. 2. *Taringa tarifaensis* n. sp. teeth from a half-row.

(Fig. 1 C). Ventrally, the spiculose foot is much narrower than the mantle and the form is bilabiate and notched (Fig. 1 B). The oral tentacles are rather long and cylindrical. The rhinophores, perfoliate, possess 17 or 18 lamellae (Fig. 1 D). The branchial tuft has 6 tripinnate gills, which surround the anal papilla (Fig. 1 E).

The ground colour of the mantle is dark violet brown. Numerous small opaque white areas are sparsely scattered all over the mantle surface (Fig. 1 A). The caryophillydiate tubercles have the same colour as the mantle, except those located in the opaque white areas that are tipped with white. Ventrally, the mantle and the foot exhibit a light violet brown colour, both with many scattered darker spots of the same colour. The edge of the foot is whitish (Fig. 1 B). The rhinophores have a light violet brown base and brilliant yellowish-white tip. Their lamellae have alternating areas of brilliant yellowish white and dark violet brown (Fig. 1 D). The gills are brilliant yellowish/whitish in colour, with very small scattered dark brown spots and a big black patch located on the external surface of the branchial rachis, close to the base (Fig. 1 E). The branchial sheaths have some small opaque white areas.

The non-lobed blood gland is located on the buccal bulb. The labial cuticle is smooth, but it has a thickened yellowish area that constitutes a ring. The radular formula of the specimen of 27 mm is $34 \times 4\text{–}5.44\text{–}46.0.44\text{–}46.4\text{–}5$. The teeth are hooked and denticulate, except the four or five marginals, which are pectinate (Figs 2 and 3). The size of the lateral teeth increases passing from the radular rachis to the radular sides. The innermost tooth (first lateral) of each half-row has 2–4 small denticles on the outer side. The remaining lateral teeth have denticles on their outer side. From the 41st/43rd tooth the size of the teeth decreases rapidly. Thus, from the 2nd to the 6th/7th tooth there are mostly 2 denticles; from the 7th/8th to the 17th/18th tooth, 3 denticles; from the 18th/19th to the 28th/29th tooth, 6–8 denticles and from the 29th/30th to the 44th/46th tooth, 13–17 denticles (Fig. 3).

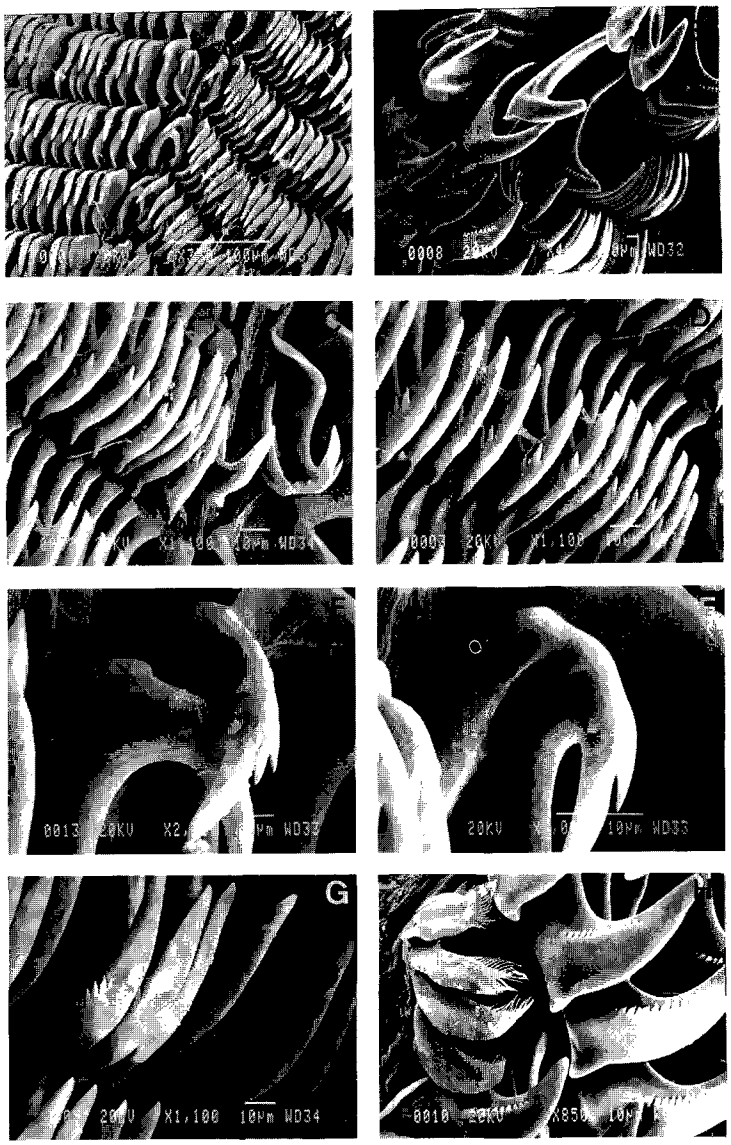

FIG. 3. *Taringa tarifaensis* n. sp. **A**, central part of the radula; **B**, outer region of the radula; **C** and **D**, detail of the denticulation on the inner side of two innermost radular teeth; **E** and **F**, inner lateral radular teeth; **G**, mid lateral radular teeth; **H**, detail of outer lateral and marginals radular teeth.

The reproductive system (Fig. 4 A) is characterized by a long hermaphroditic ampulla, a big kidney-shaped gametolytic gland and a small peanut-shaped seminal receptacle. A thin and long vaginal duct runs into the gametolytic gland near to its connection with the allosperm duct. The big granular prostate joins the unarmed and cuticularized penis by a coiled and relatively long deferent duct. The walls of the male atrium lack papillae or spines.

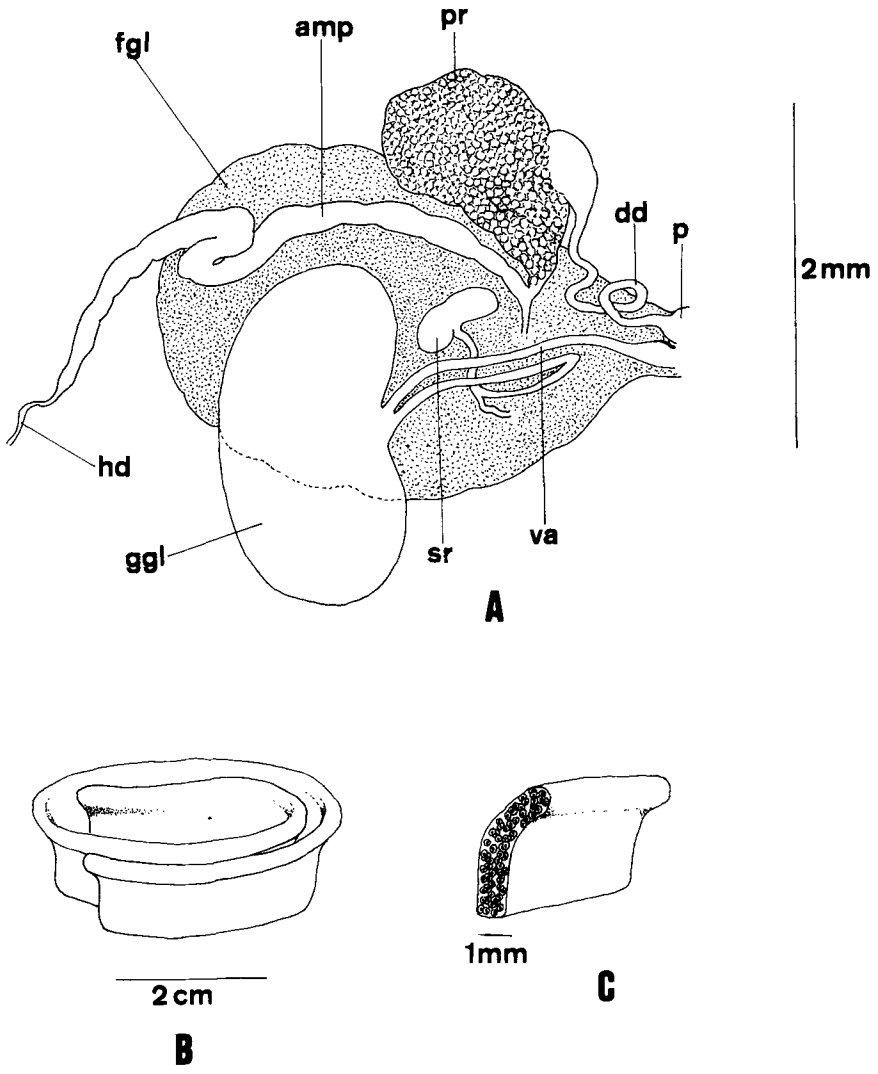

FIG. 4. *Taringa tarifaensis* n. sp. **A**, reproductive system; **B**, egg mass; **C**, cross-section of the egg mass. am, Ampulla; dd, deferent duct; fgl, female gland; ggl, gametolytic gland; hd, hermaphroditic duct; p, penis; pr, prostate; sr, seminal receptacle; vd, vaginal duct.

Derivatio nominis

The name *tarifaensis* refers to the type locality of this species, Tarifa.

Biology

The spawn of this species was observed in the laboratory. The single egg mass observed is a ribbon of approximately 1·75 whorls (Fig. 4 B). The diameter of the coil was about 3 cm (for transverse section see Fig. 4 C). Each capsule contains one egg. The eggs are almost spherical and light yellow in colour. The diameter of the capsules was approximately 100–110 μm and that of the eggs was 90–95 μm.

Table 1. Comparison of the species in the genus *Taringa*.

	T. souriei Pruvot-Fol, 1953	*T. telopia telopia*† Marcus, 1955	*T. telopia disa*† Marcus and Marcus, 1967	*T. armata*‡ Swennen, 1961
Mantle colour	Dark grey in the middle of the back; edges light grey with spots	Light yellow; orange with brown patches; dark yellowish brown; grey with black spots and powdered with fine white granules; greyish yellow with fine black specks; bright orange	Brown with dark blackish brown spots	Brown with dark and lighter spots yellowish ochre with a delicate violet shade
Foot colour	?	Light yellow	Colourless	Deep yellow with sparse brown spots
Mantle tubercles	Caryophyllidia, uniform	Tubercles biggest on the sides of the notum, smaller in the middle and borders	Tubercles biggest on the sides of the notum, smaller in the middle and borders	Caryophyllidia, uniform
Rinophoral sheaths	?	With 8 lobes	With 8 lobes	With 8 sinuosities
Gills	7	6, tripinnate	6, tripinnate	5–6, tripinnate and yellow
Radular formula	30 × 3.45.0.45.3	32 × 4–5.40.0.40.4–5	42 × 6.53.0.53.6	19–31 × 3–5.17–29. 0.17–29.3–5
Inner side of the innermost radular tooth	Without denticles	2 tiny denticles	Up to 6 tiny denticles	1 denticle or without it
Blood gland	?	Without particularities	?	Bilobed
Papillae or spines on the inner walls of the male atrium	+	+	+	+
Distribution	Senegal	Brazil	FL, USA	Turkey, Italy
References	Pruvot-Fol (1953); Bouchet (personal communication in Ortea *et al.*, 1982)	Marcus (1955)	Marcus and Marcus (1967)	Swennen (1961); Perrone (1992)

† Ortea *et al.* (1982) consider the possibility that among the subspecies *T. telopia telopia* and *T. telopia disa* there exist more than one species.
‡ Perrone (1992) did not observe spines in one of his specimens.

	T. aivica aivica Marcus and Marcus, 1967	*T. avica timia* Marcus and Marcus, 1967	*T. oleica* Ortea Pérez and Llera, 1982	*T. ascitica* Ortea, Pérez and Llera, 1982	*T. tritorquis* Ortea, Pérez and Llera, 1982
Mantle colour	Yellowish, mottled with grey	Purplish brown colour; brownish pink with brown dots light stellate marks around the bases of the light orange papillae; yellowish grey; dusty yellow, white and dark brown patches dispersed over the notum	Greyish brown with dark spots	Greenish brown with yellowish patches	Violet or yellowish red with darker patches
Foot colour	Whitish	Yellow, with several small dark brown spots	Greyish white with some spots	Greenish yellow with scattered brown patches	White
Mantle tubercles	A little bigger than the rest, detaching from them	A little bigger than the rest, detaching from them	Most tubercles caryophyllidia, but some of them are not spiculose and bigger	Caryophyllidia tubercles of different sizes	Spreaded caryophyllidia tubercles
Rinophoral sheaths	Undulates	With 8 lobular papillae	With tubercles, but without lobes	With tubercles, but without lobes	Smooth, with 6–8 lobes
Gills	6, tripinnate and brownish	6, multipinnate and light violet, yellowish grey or cream with brown flecks	6, tripinnate; darker with abundant white pigment on the tips	6, tri-tetra pinnate reddish brown with scattered opaque white patches	6, uni or tripinnate; white with red patches
Radular formula	32 × 2–3.45.0.45.2–3	29–41 × 4–6.36–70.0.36–70.4–6	31 × 4–5.46.0.46.4–5	34 × 5.50.0.50.5	24 × 3–4.50.0.50.4–5
Inner side of the innermost radular tooth	Without denticles	Without denticles	Without denticles	Without denticles	Without denticles
Blood gland	?	?	Without lobes; located posteriorly to the central nervous system	Bilobed	Without lobes; located posteriorly to the central nervous system
Papillae or spines	+	+	–	+ (very small)	–
Distribution	Pacific side of the Panama Canal	Mexico (Pacific ocean), CA, USA	Canary Is.	Canary Is.	Canary Is.
References	Marcus and Marcus (1967)	Marcus and Marcus (1967) Beherens and Henderson (1982)	Ortea *et al.* (1982)	Ortea *et al.* (1982)	Ortea *et al.* (1982)

Table 1. (*Continued*).

	T. bacalladoi Ortea, Pérez and Llera, 1984	*T. faba* Ballesteros, Llera and Ortea, 1984	*T. pinot* Perrone, 1985	*T. tarifaens*is n. sp.
Mantle colour	Greyish brown with dark patches	Brown with different tones	Greyish with dark grey or brown spots	Dark violet brown, with numerous small and sparses opaque white areas all over the mantle
Foot colour	With dark grey or brown spots	Yellowish with brown spots	Light yellowish (some brown spots in some specimens)	Light violet brown with many darker spots of the same colour
Mantle tubercles	Caryophyllidia tubercles different in size	Caryophyllidia tubercles different in size	Caryophyllidia tubercles different in size	Caryophyllidia, uniform
Rinophoral sheaths	With tubercles, but without lobes	With tubercles, but without lobes	With tubercles and 8–10 lobes	With tubercles, but without lobes
Gills	6, tripinnate; yellow with a little of dark pigment on the rachis and sheets	6, tripinnate; yellowish with some brown spots and a little of white pigment on the rachis	6, tripinnate; light grey or greyish ochre	6, tripinnate; yellowish/whitish colour, with scattered dark brown spots and a big black patch on the external rachidian surface, close to the base
Radular formula	31 × 3–4.54.0.54.3–4	39 × 4–5.50.0.50.4–5	26 × 5.42.0.42.5	34 × 4–5.44–46.0.44–46.4–5
Inner side of the innermost radular tooth	Without denticles	Without denticles	Without denticles	2–4 small denticles
Blood gland	Bilobed	Bilobed	Bilobed	Without lobes, located anteriorly to the central nervous system
Papillae or spines on the inner walls of the male atrium	+	?	–	–
Distribution	Canary Is.	Mediterranean (Iberian penisula)	Mediterranean (Italy)	Strait of Gibraltar (Iberian peninsula)
References	Ortea *et al.* (1982)	Ballesteros *et al.* (1984)	Perrone (1985a, 1992)	Present study

Discussion

The main internal and external features of *Taringa tarifaensis* are compared with those of all the known species of the genus in Table 1. Besides the differences there presented, it is interesting to point out that in all eastern Atlantic species of *Taringa* the highest number of denticles on the outer side of the lateral radular teeth is less than in *T. tarifaensis*. Moreover, *T. pinoi* Perrone, 1985 has denticulation only on the bigger lateral teeth and its marginal teeth differ greatly (Perrone, 1985a). In that work, Perrone reported 10 marginal radular teeth in this species, but recently he (Perrone, 1992) has corrected himself: there are only five. The description of *T. faba* (Ballesteros *et al.*, 1984) does not provide details of the wall of the male atrium, so this feature cannot be compared. On the other hand, if we compare the shape and/or size of the gametolytic gland and seminal receptacle of the eastern Atlantic species (except for those of *T. souriei* (Pruvot-Fol, 1953) and *T. armata* Swennen, 1961 in which these structures are undescribed) we can see that the shape of both organs is similar only in *T. faba* and *T. tarifaensis*, though the gametolytic gland of the former is bigger. Moreover, the seminal receptacle of *T. faba* connects with the female and gametolytic glands through a duct that originates from an extremity of the seminal receptacle (Ballesteros *et al.*, 1984, fig. 12 K), whereas in *T. tarifaensis* it starts from the central part (Fig. 4 A).

Millen (1982) includes the genus *Taringa* within the taxonomically complicated Discodorididae using the classification scheme of Thiele (1931), as modified by Marcus and Marcus (1967) and Franc (1968). However, we include this genus within the Platydorididae following Ortea *et al.* (1982), Cervera *et al.* (1988), Cattaneo-Vietti and Thompson (1989), Sabelli *et al.* (1990) and Cattaneo-Vietti *et al.* (1990). Perrone (1985a, b) considers *Taringa* a member of the Discodorididae, but he points out that this genus could be regarded as being halfway between the Discodorididae and Platydorididae, showing features of both families. Previously, Ortea *et al.* (1982) pointed out the proximity of the genus *Thordisa* Bergh, 1877 (Discodorididae) to *Taringa*.

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