

Description of a New Species in the Genus *Tambja* Burn, 1962 (Gastropoda: Nudibranchia: Polyceratidae) from Southern Spain

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Abstract. A new species of *Tambja* is described from the western Mediterranean on the coast of southern Spain. The external and internal features of this species are compared with those of the known Atlantic species of the genus *Tambja marbellensis* sp. nov. varies in color between dark blue, almost black, and dark greenish blue. It has a yellow band on the edge of the notum and the foot, and other bands of the same color and differing in length, on the notum flanks, and tail. The radula is typical of the genus *Tambja*, with the inner lateral tooth having a conspicuous denticle on the inner edge of the primary cusp. The second inner lateral tooth also has a small cusp. The reproductive system has a differentiated prostate from the deferent duct, and the bursa copulatrix and the seminal receptacle are similar in size.

INTRODUCTION

To date, the only known species of the genus *Tambja* Burn, 1962, in European waters is *T. ceutae*. Described some years ago by García-Gómez & Ortea (1988), it was collected on the coast of Ceuta (African side of the Strait of Gibraltar). This species has been recorded recently on the coast of the Azores Archipelago (Wirtz & Martins, 1993; Wirtz, 1995) and the Canary Islands (Ortea et al., 1996).

Frequent samplings along the coast of the Province of Malaga (southern Spain, western Mediterranean) have permitted us to find specimens of a second undescribed species of *Tambja*, which is described in this paper.

SYSTEMATIC DESCRIPTION

Suborder DORIDACEA

Family POLYCERATIDAE Alder & Hancock, 1845

Genus *Tambja* Burn, 1962

Tambja marbellensis Schick & Cervera, sp. nov.
(Figures 1-3)

Material: Holotype: One specimen, 45 mm in length, collected at 10 m depth, Torre del Cable (Marbella, Má-

laga) (36°52'35"N, 04°30'01"W), southern Spain, July 1995, K.L. Schick coll. This specimen has been deposited in the Museo Nacional de Ciencias Naturales of Madrid, with the catalogue number 15.05/26031.

Paratype: One specimen, 12 mm in length, collected at 10 m depth Torre del Cable, May 1995, K.L. Schick coll. A photograph of this specimen and its radula have been deposited in the Museo Nacional de Ciencias Naturales, with the catalogue number 15.05/27819. We have deposited only the photograph and radula, because the specimen died early in the aquarium before we were able to preserve it. The specimen was slightly decomposed and all of the internal structures, with the exception of the radula, could not be studied.

Diagnosis: Body limaciform with widened head; notum with smooth edge and tail. Ground color dark blue or dark greenish blue. Edge of notum and foot yellow; notum flanks of body and tail with several yellow stripes different in length. Outer surface of gill rachis yellow and rhinophoral sheaths bordered with yellow. Yellow stripes and marks shaded with brown. Rachidian tooth wider than tall and notched at anterior edge; inner lateral radular

Figure 1

Tambja marbellensis Schick & Cervera, sp. nov. Dorsal view (A), lateral view (B), and detail of the anterior part (C) of the holotype. D. Detail of the rhinophore. E. Dorsolateral view of the paratype. Key: br, brownish; db, dark blue; dgb, dark greenish blue; ye, yellow.

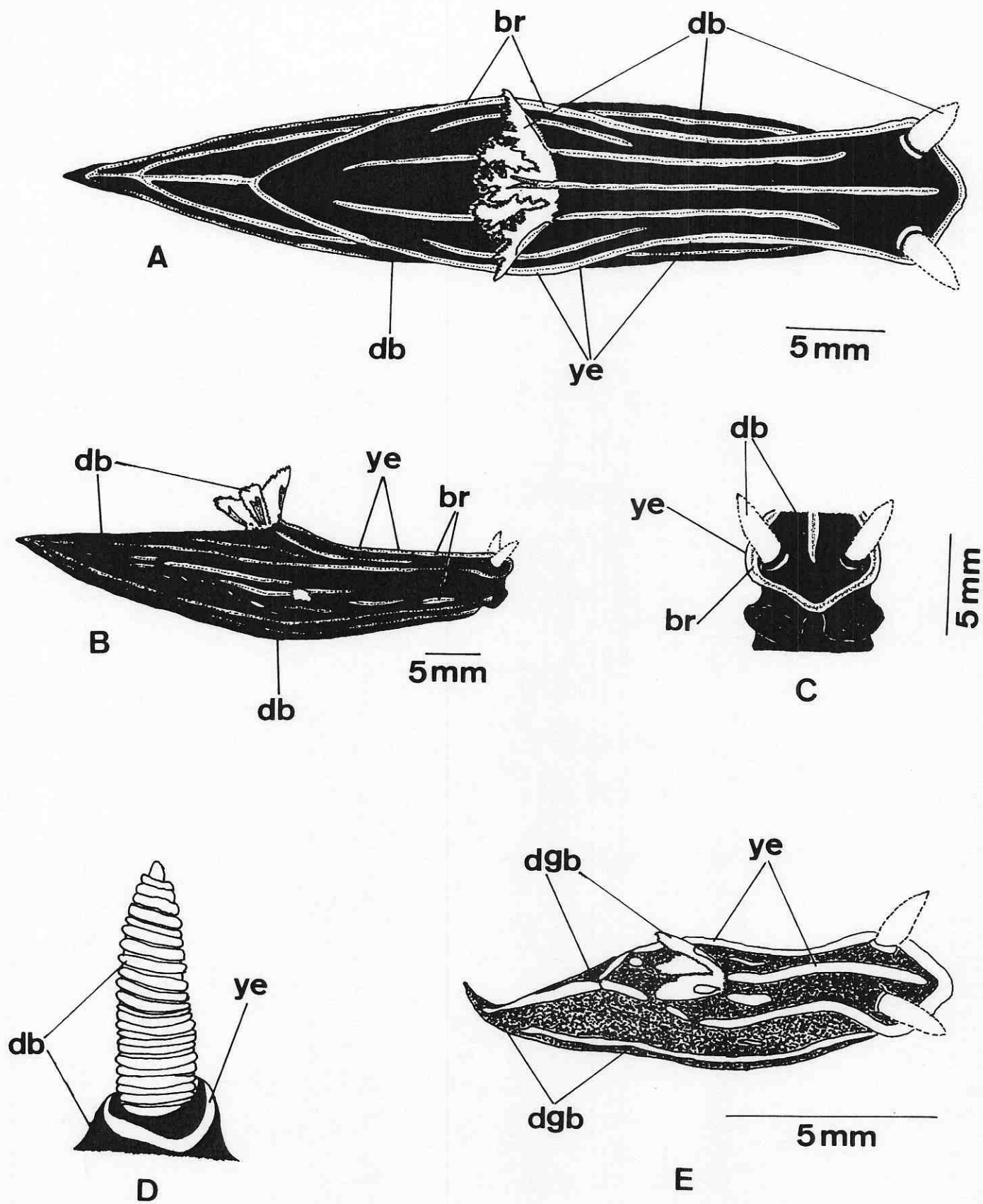


Table 1
Comparison of the Atlantic species of the genus *Tambja* Burn, 1962.

	<i>T. gratiosa</i> (Bergh, 1890)	<i>T. capensis</i> (Bergh, 1907)	<i>T. divae</i> (Marcus, 1958)	<i>T. oliva</i> Meyer, 1977	<i>T. fantasmalis</i> Ortea & García-Gómez, 1986	<i>T. ceutae</i> García-Gómez & Ortea, 1988	<i>T. anayana</i> Ortea, 1989	<i>T. marbellensis</i>
Ground color	Light yellowish with random round grey-green spots on the back and sides. Blue-black also occurs on forehead, edge of foot, and rim of oral tentacles.	Deep blackish blue or black. The sole of the foot somewhat yellowish white. Edge of notum green.	Scarlet with white dots	Deep olive green to light green or olive yellow. Microscopic flecks of yellow, blue or turquoise. Tips of tail and oral tentacles light to dark purple or blue-green. Two large light grey spots behind rhinophores.	Violet-blue-black, 2 phosphorescent green bands on the back, 2 on each flank.	Greenish blue or dark blue, 5 yellow lines on the notum and another 2 on each flank. All lines bordered with dark blue-black. Two large dark grey spots behind the rhinophores.	Light khaki green, some black points. Edge of the notum and back of the tail violet. Violet lines between the rhinophores and behind the gills.	Dark blue or dark greenish blue. Several yellow lines on the notum and the flanks. Edge of the notum and foot yellow. Adults have the yellow lines shaded by brown.
Rhinophores	Yellowish with blue black clubs	Blue-black	Scarlet	Purple or white with opaque cream spots	Dark blue (including their sheaths)	Dark blue; dark blue sheaths, the margin bordered with yellow.	Light green, except the lower $\frac{2}{3}$ of the anterior side that is violet.	Dark blue; dark blue rhinophoral sheaths, but the margin bordered with yellow.
Gills	Bi-tripinnate. Blue-black.	7, tripinnate. Same color as the body.	3, tripinnate. White.	4-5, pinnate. Same color of the body, but the tips are light to dark purple or blue-green.	5, tripinnate. Dark blue outer side with 2 green lines on their lower half; green inner side on their lower half and blue on the upper half.	5, tripinnate. Yellow outer and inner side of the rachis, except a dark blue wedge on the outer side. All the leaves dark blue.	3, tripinnate. Light green.	5, tripinnate. Dark blue with a yellow outer surface of the rachis. Yellow marks of the adults shaded by brownish.
Edge of the notum	Smooth	Smooth	Smooth	Smooth	Smooth	With blue or greenish blue conical papillae	Smooth	Smooth
Tail	Smooth	Smooth	Smooth	Smooth	Smooth	With blue or greenish blue conical papillae	Smooth	Smooth

Table 1
Continued.

	<i>T. gratioiosa</i> (Bergh, 1890)	<i>T. capensis</i> (Bergh, 1907)	<i>T. divae</i> (Marcus, 1958)	<i>T. oliva</i> Meyer, 1977	<i>T. fantasmalis</i> Ortea & García-Gómez, 1986	<i>T. ceutae</i> García-Gómez & Ortea, 1988	<i>T. anayana</i> Ortea, 1989	<i>T. marbellensis</i>	
Radula	16 × 1-3.0-1.1.0-1.1-3. Inner lateral tooth bicuspid (both cusps equally strong).	14-19 × 5-6.1.R.1.5-6. Inner lateral tooth monocuspid.	16 × 5-6.1.R.1.5-6. Inner lateral tooth monocuspid.	12-13 × 4.1.R.1.4. Inner lateral tooth bicuspid.	13 × 4.1.R.1.4. Inner lateral tooth monocuspid.	15 × 4.1.R.1.4. Inner lateral tooth monocuspid.	28 × 3-4.1.R.1.3-4. Inner lateral tooth bicuspid in rows 1st to 22th (with progressive decreasing of the 2nd cusp), monocuspid in rows 23 to 28.	13-16 × 3-4.1.R.1.3-4. Inner lateral tooth bicuspid.	
Reproductive system	Bursa copulatrix bigger than the seminal receptacle. The oviduct has a small accessory gland. No vestibular gland is reported. Penis with spines.	Deferent duct lacking a prostate morphologically differentiated. Bursa copulatrix bigger than the seminal receptacle. A vestibular gland present ^a . Penis with spines.	Deferent duct with a prostate slightly morphologically differentiated. Bursa copulatrix bigger than the seminal receptacle. No vestibular gland is reported. Penis with spines.	Deferent duct with a prostate slightly morphologically differentiated. Gland of indeterminate function connected to bursa copulatrix by a short duct. Penis with spines ^b .	Prostate morphologically not differentiated. Bursa copulatrix bigger than the seminal receptacle. Vestibular and penial glands present. Penis with spines.	Prostate morphologically differentiated. Bursa copulatrix bigger than the seminal receptacle. Vestibular gland present. Penis with spines.	Prostate morphologically differentiated. Bursa copulatrix and seminal receptacle similar in size. Vestibular gland present. Penis with spines.	Not described	Prostate morphologically differentiated. Bursa copulatrix and seminal receptacle similar in size. Vestibular gland present. Penis with spines.
Geographical range	West of Florida keys (Gulf of Mexico)	Cape Province (South Africa)	Arraial do Cabo, Cabo Frio (Brazil).	Caribbean coast of the Panama canal zone; Bahamas.	Cape Verde	Azores, Canary Islands, strait of Gibraltar, western Mediterranean	Cape Verde	Western Mediterranean	
References	Bergh (1890)	Bergh (1907); Macnae (1958); Gosliner (1987)	Marcus (1958)	Meyer (1977); Redfern & Worsfold (pers. com.)	Ortea & García-Gómez (1986)	García-Gómez & Ortea (1988); Wirtz & Martins (1993); Wirtz (1995); present study	Ortea (1989)	Present study	

^a Macnae (1958) does not refer to the existence of this gland.

^b Meyer (1977) does not draw the arrangement of the reproductive system.

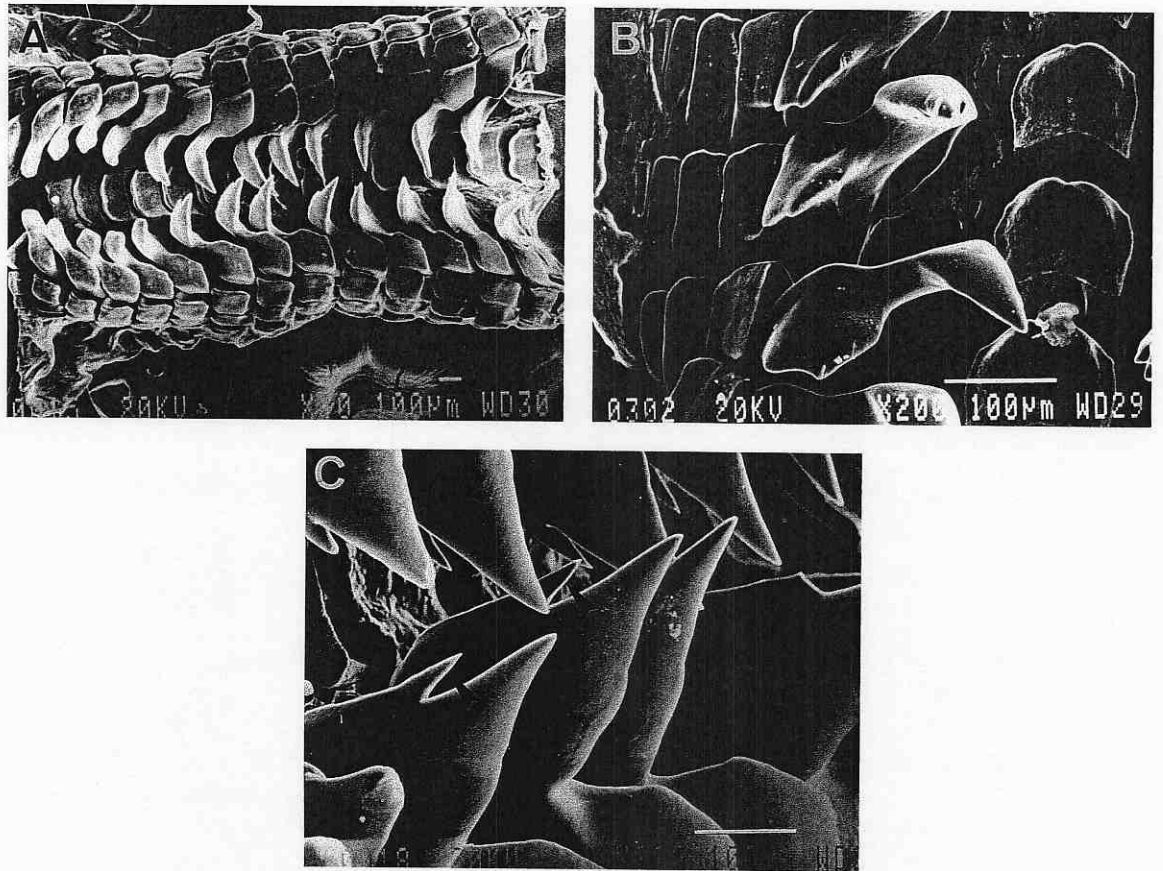


Figure 2

T. marbellensis Schick & Cervera, sp. nov. A. General view of the radula of the holotype. B. Detail of the rachidian and lateral radular teeth of the paratype. C. Detail of the dorsal view of the cusps of the inner lateral radular teeth of the holotype (arrow heads indicate the inner denticle).

tooth hooked, with large bicuspid primary cusp; second inner lateral tooth with small cusp. Rounded bursa copulatrix and pyriform seminal receptacle similar in size; prostate well differentiated and vestibular gland well developed.

Description: Body limaciform with widened head; notum, and its edge and tail smooth. Oral tentacles short and dorsoventrally flattened. Dark blue rhinophores have 25 lamellae and conical clavus (Figure 1D). Smooth sheaths dark blue bordered with yellow. Five gills tripinnate and non-retractile, situated around anal papillae.

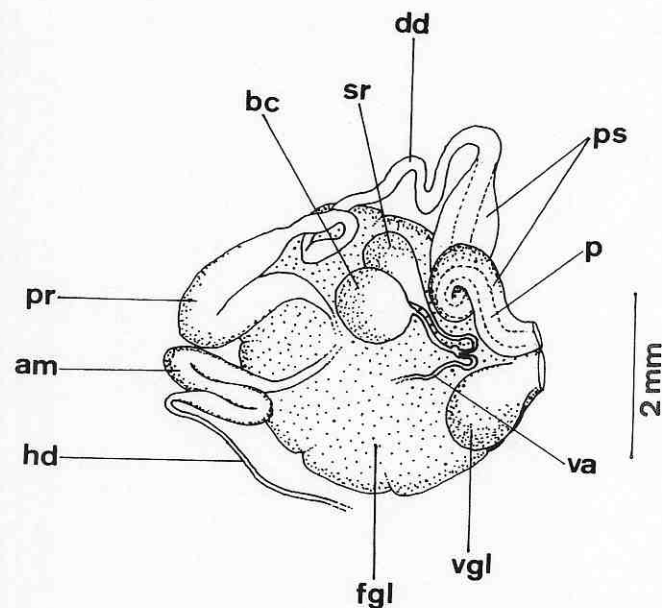


Figure 3

T. marbellensis Schick & Cervera, sp. nov. Reproductive system. Key: am, ampulla; bc, bursa copulatrix; dd, deferent duct; fgl, female gland; hd, hermaphroditic duct; p, penis; pr, prostate; ps, penial sheath; sr, seminal receptacle; va, vagina; vgl, vestibular gland.

Three anterior gills more highly developed. Gills dark blue with yellow outer surface of rachis. Ground color varies between dark blue, almost black, and dark greenish blue. Yellow band around edge of notum. Notum with several stripes of this color (Figure 1). Mid line extending from anterior part of head, near edge of notum, to middle gill, branching onto outer side of rachis. Another two lines start from posterior cephalic region and run between middle line and edge of notum reaching gills, extending on outer side of each rachis (Figure 1A, C). Two other yellow lines start from notal region in front of gills and run very close to edge of notum ending in postbrachial region. Another two yellow lines start from base of gills to posterior region of notum, but without reaching edge. Edge of foot also bordered by yellow band, which joins that of edge of notum via band of same color that runs dorsally down tail. Several yellow lines, varying in number and length according to size of specimen, distributed on both flanks of body (Figure 1B). In adult specimen, only one of these lines runs from cephalic region as far as dorsal line on tail. Central region of almost all these lines was brownish shade, in 45 mm specimen (Figure 1A).

With respect to internal anatomy, radular formula of 12 mm specimen $13 \times 3-4.1.R.1.3-4$ and that of 45 mm specimen $16 \times 3-4.1.R.1.3-4$ (Figure 2A). Rachidian tooth, wider than tall, notched at anterior edge. Inner lateral tooth hooked with large primary cusp, with conspicuous denticle on inner edge (Figure 2A, B), and smaller triangular basal cusp (Figure 2C). Remaining lateral teeth scalelike and less developed than former (Figure 2B), although second inner lateral has small cusp. Reproductive system (Figure 3) with hermaphroditic duct that continues, as S-shaped ampulla. Bursa copulatrix rounded; seminal receptacle pyriform, both similar in size. Vagina very straight, entering female gland almost at central region. Oval vestibular gland well developed. Deferent duct with well-differentiated prostate. Penis armed with numerous hooked spines.

DISCUSSION

To date, only seven species of the genus *Tambja* have been described from Atlantic waters. The most important features of these species are compared in Table I. The external and internal features of *T. marbellensis* permit it to be distinguished from the remaining cogenetic Atlantic species, including *T. ceutae*, which is the most similar species. *T. marbellensis* lacks the conical papillae of the notal ridge and tail characteristic of *T. ceutae*, which are even more conspicuous in young specimens (personal observation), the yellow lines on the inner surface of the rachis of the gills of the second species, and also the two large dark grey spots behind the rhinophores of that species, but it has the yellow lines shaded by brown that do not occur in those of *T. ceutae*. With respect to the in-

ternal anatomy of both species, the inner lateral tooth is bicuspid in *T. marbellensis* and monocuspid in *T. ceutae*, and the two allosperm receptacles are similar in size in the former species and different in the latter. Moreover, the deferent duct in *T. ceutae* is more elongate and coiled than in our species.

As García-Gómez & Ortea (1988) pointed out previously, the species attributed to *T. diaphana* (Bergh, 1878) (quoted as *Nembrotha*) by Pruvot-Fol (1927) from the Moroccan coast could constitute a new species of this genus, although the exact identity of that species would require the study of additional specimens from the same locality or nearby areas. On the other hand, we agree with the opinion of Drs. Richard Willan and Clay Carlson (personal communication) that since every species of the genus *Tambja* has a limited geographical range, it is practically impossible that the Pruvot-Fol species is conspecific with Bergh's *T. diaphana* from the Palau Islands (tropical Pacific). Our species can be distinguished from the Pruvot-Fol species since, according to her description, it has a sulphur yellow ground color with emerald green lines on the back that join between them before the rhinophores and behind the gills.

Etymology: The specific name refers to Marbella, the type locality of the species.

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