

Manuel Ballesteros · Conxita Avila

## A new tritoniid species (Mollusca: Opisthobranchia) from Bouvet Island

Received: 27 April 2005 / Revised: 17 August 2005 / Accepted: 17 August 2005 / Published online: 23 November 2005  
© Springer-Verlag 2005

**Abstract** Tritoniid sea slugs (Mollusca, Gastropoda, Opisthobranchia) are reported for the first time from Bouvet Island. *Tritonia dantarti* sp. n. shows morphological and anatomical differences with regard to the two previously known tritoniids reported from Antarctica and Sub-Antarctica, *Tritonia vorax* (Odhner 1926) and *Tritonia challengeriana* Bergh, 1884. Regarding the external morphology, *T. dantarti* sp. n. is characterized by a very bright orange coloration in the dorsum, white dorsal crests, highly ramified dendritic gills (the largest vertically orientated and the rest laterally orientated), and a quadrangular cross section. The radula presents very long, thin lateral teeth and the jaws present mainly unicuspidate, striated denticles. The seminal receptacle is large, pear-shaped and its grey pigmentation differs from the rest of the genital system. The Antarctic species *T. challengeriana* was also found in waters off Bouvet Island, while the Subantarctic species *T. vorax* was not found.

### Introduction

The taxonomy of the family tritoniidae has been unclear for a long time, mainly because descriptions of new species included only external anatomy and lacked information on the radula, jaws, stomach plates and internal anatomy (Odhner 1936, 1963; Willan 1988; Smith and Gosliner 2003). Until now, the Antarctic *Tritonia* included only two species (Wägele 1995; Schrödl 2003). *Tritonia vorax* (Odhner 1926) has been

reported from South Georgia, Burdwood Bank and Tierra del Fuego, while *Tritonia challengeriana* Bergh, 1884 has been cited from the Antarctic Peninsula, South Georgia, Weddell Sea, Patagonia, Falklands and Signy Island (Odhner 1926; Wägele 1995; Schrödl 2003). Previous records under different names were synonymized first by Wägele (1995) and later by Schrödl (2003), and therefore we follow here the most recent studies (*e.g.* *Tritonia antarctica* is considered to be a synonym of *T. challengeriana*).

During the ANTXXI/2 cruise to the Weddell Sea in late spring–early summer, on board of R/V “Polarstern” (AWI), we collected Antarctic opisthobranch molluscs in the Weddell Sea and in the Island of Bouvet. Preliminary data on the opisthobranchs collected was published in the cruise report (Avila et al. 2005). The island of Bouvet is particularly interesting because of its geographically isolated position in the Southern Ocean, while being influenced by the West-Wind drift and the Antarctic Circumpolar Current, and the Weddell Sea Gyre, which might allow for faunal exchange between the faunas of Bouvet Island and the High Antarctic Weddell Sea (Arntz et al. 2005, this volume). Very few studies have been dedicated to the shelled molluscs of these area (see Linse 2005 for a review), while nothing was known about non-shelled opisthobranchs (Dell 1990). The opisthobranchs collected during the ANTXXI/2 cruise at Bouvet Island have been reported in the faunistic overview on the Bouvet fauna (Arntz et al. 2005, this volume). In summary, 50 specimens belonging to eight species were collected between November 2003 and January 2004. One of these species was identified as an unknown tritoniid, and this new species is described herein.

### Materials and methods

Specimens of *Tritonia dantarti* sp. n. ( $n=13$ ) were collected in waters off Bouvet Island (54°24'S and 3°21'E) at about 134 m depth by using an Agassiz trawl (station

M. Ballesteros (✉)  
Department de Biologia Animal, Facultat de Biologia,  
Universitat de Barcelona, Av. Diagonal 645,  
08028 Barcelona, Spain  
E-mail: mballesteros@ub.edu

C. Avila  
Centre d'Estudis Avançats de Blanes (C.S.I.C.),  
c/ Accés a la Cala Sant Francesc, 14,  
17300 Blanes, Girona, Spain

**Table 1** Station data of samples from Bouvet Island

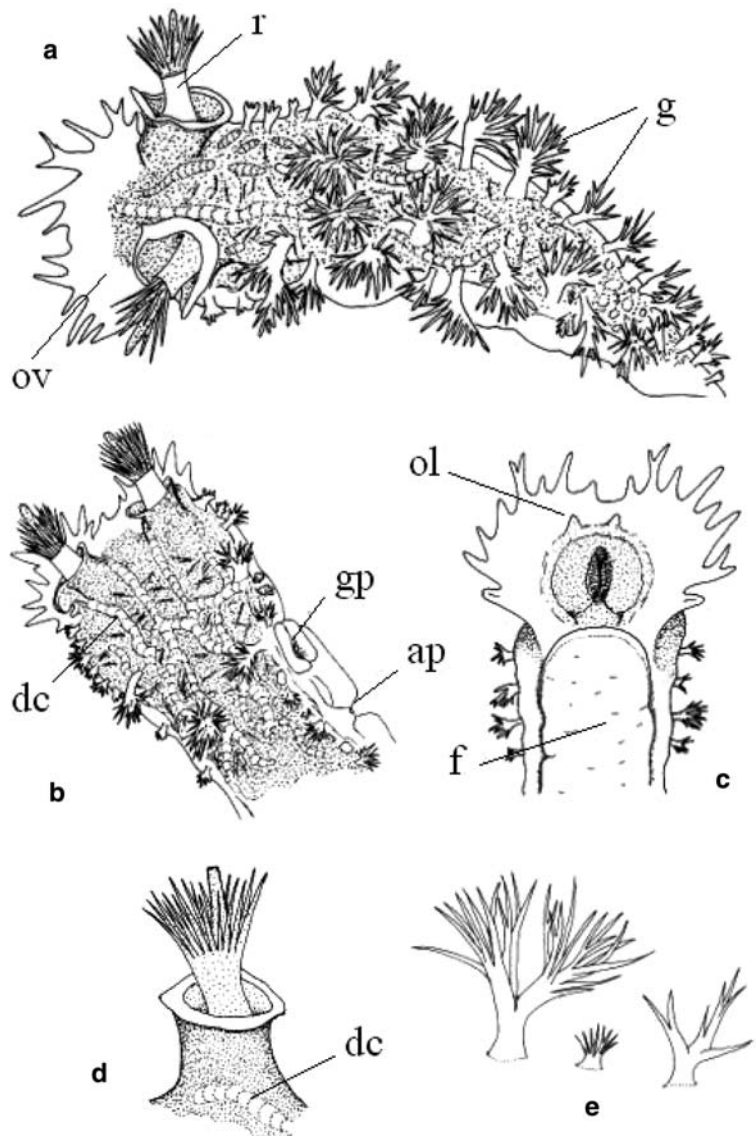
Station code	Date	Latitude S (start–end)	Longitude E (start–end)	Depth range (m)
PS65/019-1	24 Nov 2003	54°30.09'–54°30.01'	003°14.13'–003°13.97'	247–259
PS65/028-1	25 Nov 2003	54°22.49'–54°22.54'	003°17.58'–003°17.21'	134–122
PS65/029-1	25 Nov 2003	54°31.59'–54°31.51'	003°13.05'–003°12.84'	376–364

code PS65/028-1, Table 1; see Arntz and Brey 2005 and Arntz et al. 2005, this volume, for more details on the stations). This station was located on the Eastern shelf of the Island (for a map, see Fig. 1 in Linse 2005, this volume).

Specimens of *T. challengeriana* ( $n = 17$ ) were similarly collected by using an Agassiz trawl, in two stations located in the Eastern shelf of Bouvet at about 260 and 377 m depth, respectively (station codes PS65/019-1, PS65/029-1, Table 1; Fig. 1; see Arntz and Brey 2005 and Arntz et al. 2005, this volume, for more details on the stations).

The animals were measured and photographed alive and then processed for different studies (Table 2). Morphological observations on external features and coloration were taken from live specimens. Several specimens were fixed for internal anatomical studies (Table 2), while others were frozen for further chemical analysis or fixed for further studies with transmission electron microscopy (TEM). Radula and jaws of several specimens were dissected under the microscope and then processed for scanning electron microscopy (SEM). Internal anatomy of preserved specimens was studied using a dissecting microscope.

**Fig. 1** *Tritonia dantarti* sp. n. External anatomy of the living animal. **a** Dorsal view of the holotype, **b** anterior part of the body, **c** ventral view of the anterior part, **d** rhinophore, **e** detail of the dendritic gills. (*ap* anal papillae, *dc* dorsal crest, *f* foot, *g* gills, *gp* genital opening, *ol* oral lips, *ov* oral veil, *r* rhinophore)



**Table 2** Morphological and radular teeth data of the *Tritonia dantarti* sp. n. specimens and treatment

Specimens	Treatment	Length × wide (mm)	Radular formula
1	Fixed 70% ethanol	28×7	30×45.1.1.1.45
2	Fixed 70% ethanol	18×6	35×35.1.1.1.35
3	Fixed 70% ethanol	26×8	38×48.1.1.1.48
4	Fixed 70% ethanol	22×7	32×41.1.1.1.41
5	Fixed 70% ethanol	26×8	Holotype (MNCN 15.05/46.707), not dissected
6	Fixed 70% ethanol	25×8	30×46.1.1.1.46
7	Fixed 96% ethanol	24×10	Not dissected
8–11	Frozen	–	Not dissected
12, 13	Fixed in Karnovsky	–	Not dissected

All the specimens of the new species, *T. dantarti* sp. n., were found at one single station (PS65/028-1). The invertebrate fauna of this station was studied by photographing and analyzing the material from the trawl, in order to gather information on the species' habitat.

## Results

The material from the trawl obtained from station PS65/028-1 included, apart from the *T. dantarti* sp. n. specimens, many ophiuroids (*Ophionotus victoriae* and others), seastars (*Porania* cf. *antarctica*), orange holothurians (*Ekmocucumis* cf. *steineni*), sedentary polychaetes with calcareous tubes, hydroids, pink alcyonarians, different actinian species, amphipods and pycnogonids (see more details on the fauna of this station in Arntz et al. 2005, this volume).

Systematic description of *T. dantarti* sp. n.

Family **TRITONIIDAE** Lamarck, 1809

Genus *Tritonia* Cuvier, 1797

*T. dantarti* sp. n.

**Material** Thirteen specimens measuring between 18 and 33 mm long are collected at station PS65/028-1 (Table 2). Specimen 5 has been designated as the holotype and it is deposited in the “Museo Nacional de Ciencias Naturales” (Madrid, Spain) (museum number 15.05/46.707). The remaining specimens are at the “Centre d’Estudis Avançats de Blanes” (CSIC, Blanes, Spain) and in the “Centre de Recursos de Biodiversitat Animal” (Biology Faculty, University of Barcelona, Spain).

**Etymology** The species is named *T. dantarti* sp. n. in honor to our recently disappeared colleague, malacologist and friend Lluís Dantart.

**Distribution** Bouvet Island.

**External anatomy** The body is high and long, with an atypical shape for a *Tritonia* species and a quadrangular cross section (Fig. 1a). The lateral sides and the foot are white, but the dorsum possesses a characteristic bright

orange coloration, very intense in some areas, and occasionally reddish. The oral veil is wide, semitransparent and bilobed. The finger-like velum processes are distributed into 6–8 in each velum lobe (Fig. 1b, c). The finger-like velar processes are occasionally bifurcated and present in different sizes. The rhinophores possess a wide basis, with some white pigmentation, and the tip is not longer than the tripinnate processes surrounding it (Fig. 1d). The tip and these tripinnate rhinophoral processes are light yellow. The rhinophoral sheath is wide, high and opens in a trumpet shape. The apical margin of the rhinophoral sheath is white, irregular, and presents two protuberances at the sides. The internal side of the rhinophoral sheath is orange, similar to the dorsal notum.

The foot is large (Fig. 1c), and in the transparent lateral sides the pinkish viscera can be observed. Two small oral lips are present in the peribuccal area of the fixed animals (Fig. 1c), but these were not observed in the live animals. The foot presents an anterior groove (Fig. 1c). The genital papilla is wide and can be easily observed next to the fourth gill cluster. Behind this, the anal papilla is found (Fig. 1b).

The dorsal surface of the mantle presents several white crests that run from the anterior to the posterior part of the body, with some ramifications (Fig. 1b). The crests have an irregular border and a variable design. In most specimens two long crests are found, starting at the bases of the rhinophoral sheaths. In the posterior part these crests divide and are directed to the bases of the gill clusters. In some specimens, at the very posterior part of the body, the crests finish and small warts or protuberances appear. These warts are observed in live and fixed animals, while the crests and the orange pigmentation are observed only in live specimens.

The dendritic gill clusters are abundant on both sides of the dorsal margins (Fig. 1a, b). They are of different sizes and shapes (Fig. 1e), although all of them are opaque white. The smallest gills are just elongated processes, digitated, rounded or pedunculated. The largest gills are also opaque white, situated behind the genital papilla. The largest gills present a large, thick stalk from which the secondary branches appear, and then they divide in fine dendritic processes (Fig. 1e). In the largest specimens, these large dendritic gills are very conspicuous and are orientated to the dorsum vertically, not laterally as the rest. There are up to 33 gills on each side

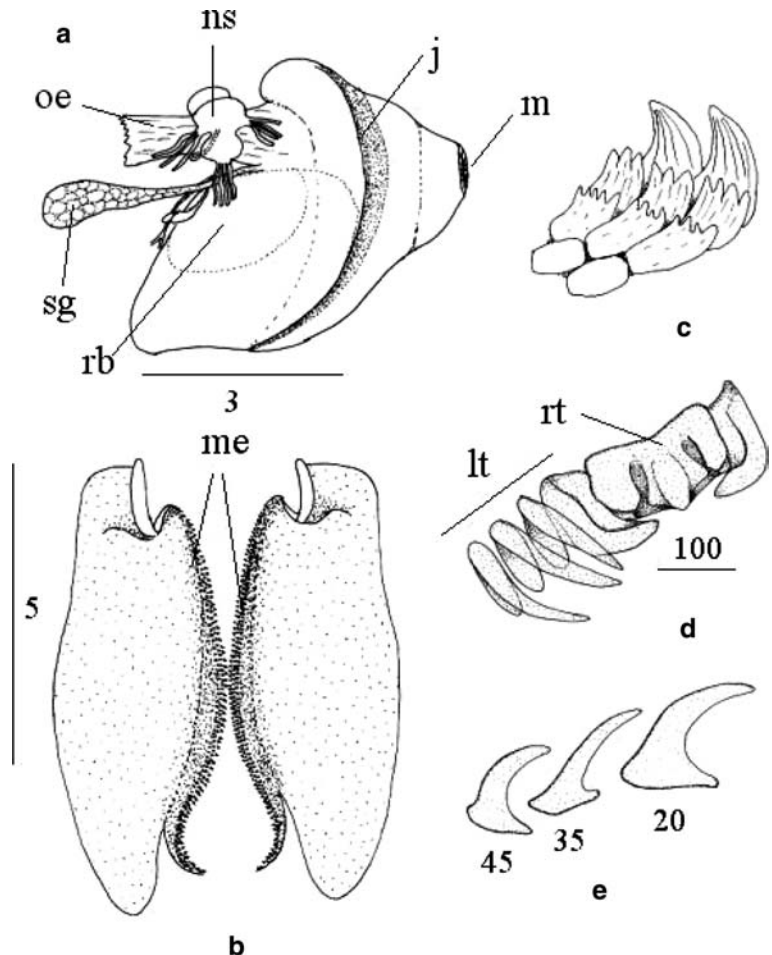
of the body, and from these 8–10 are larger than the rest. The margin of the dorsum, from which the gill clusters appear, is undulated, with small elevations from where the largest gills come out, and valleys from where the smaller gills come out.

**Buccal armature and radula** The buccal bulb (Fig. 2a) measured 7.5 mm long  $\times$  5.5 mm high in the 28-mm-long specimen, and 5 mm $\times$ 3 mm in the 18 mm specimen. In the rest of specimens, measures are: 7 mm $\times$ 4 mm (22 mm specimen), 6 mm $\times$ 4 mm (25 mm specimen) and 6 mm $\times$ 5 mm (26 mm specimen). The jaws (Fig. 2b) are long and narrow (7.5 mm $\times$ 3 mm in the 28 mm specimen). The color of the jaws is light yellow, with the masticatory border darker. The jaws are curved towards the internal side at the dorsal level (Figs. 2c, 3c). The masticatory border presents conic denticles, slightly curved, arranged in several rows (Fig. 3a–d). There are up to seven rows in the 28 mm specimen. There are 3–4 rows of larger denticles. The remaining denticles decrease in size until becoming plates without any elevations. The largest denticles are longitudinally striated (Figs. 2c, 3a), while the smallest are not. The smallest denticles are only occasionally serrated (Fig. 2c).

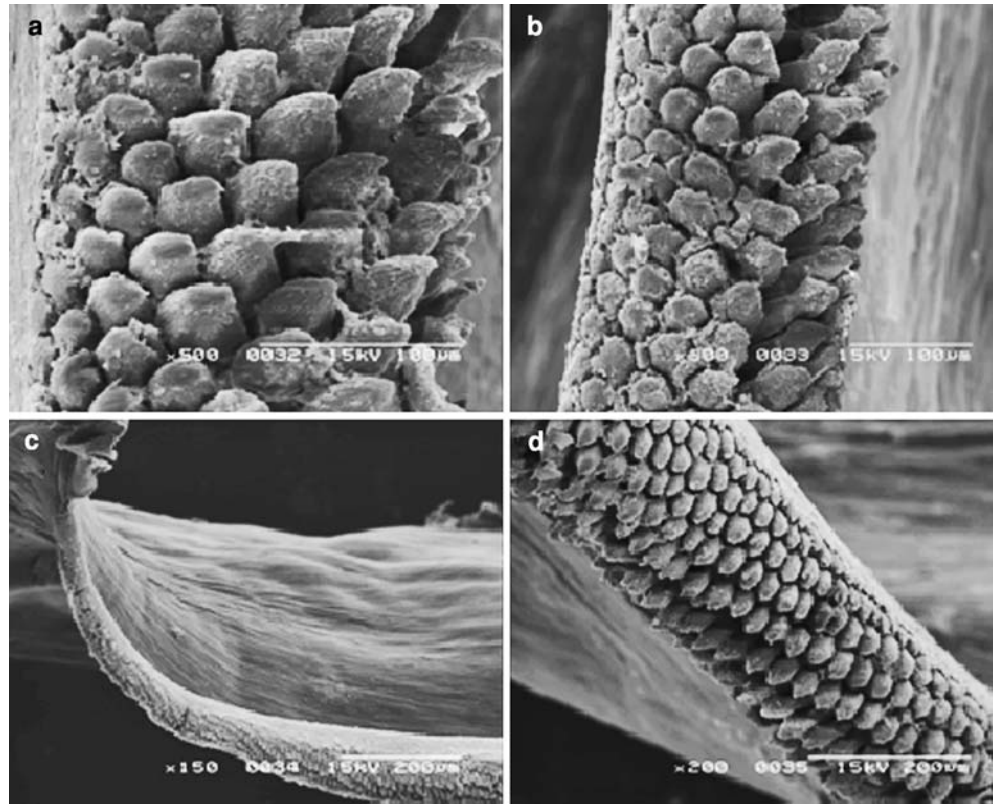
The formula of the radula is 35 $\times$ 45-1-1-1-45 in the largest specimen dissected (28 mm) and 35 $\times$ 35-1-1-1-35 in the smallest (18 mm). The remaining specimens had similar radular formulae (Table 2). The rhachidian tooth is wide (230  $\mu$ m in the central radulae of the 28 mm specimen) and unicuspidated, with a short central cusp and two lateral rounded protuberances (Figs. 2d, 4b, c). The first lateral is broad and spatulated, with a small cusp directed towards the internal side (Figs. 2d, 4c). The lateral teeth are thin, long (longer than the rhachidian) and curved (Fig. 4a, d–f). Their shape is simple, hooked and smooth, with a wide base (Fig. 2e). Their size increases from the first one, smallest, to the central hemiradula, where they start decreasing again in size until the marginal teeth. The cusp of the largest teeth measures between 300 and 325  $\mu$ m.

**Internal anatomy** All viscera appear uniformly white except the seminal receptacle, which is grey (Fig. 5a, b). The 28 mm specimen shows a wide oesophagus which exits the pharynx dorsally (Fig. 5a). The nervous ring surrounds the initial part of the oesophagus, where also two white salivary glands, small and elongated, are located (Fig. 5a). The oesophagus is long and extends from the left dorsal side of the body, below the genital

**Fig. 2** *Tritonia dantarti* sp. n. Internal anatomy. **a** Buccal bulb (scale in mm), **b** jaws (scale in mm), **c** denticles of the masticatory edge of the jaws, **d** rhachidian and first lateral teeth of the radulae (scale in microns), **e** different length and shape of the teeth of the radulae. (*ns* nervous system, *j* jaw, *lt* first lateral teeth, *m* mouth, *me* masticatory edge, *oe* oesophagus, *rb* radular bulb, *sg* salivary gland)



**Fig. 3** *Tritonia dantarti* sp. n. Scanning electron micrographs of the jaws. **a** Detail of the rows of denticles in the anterior part. **b** Detail of the denticles in the posterior part, showing unicuspidated denticles. **c** Partial view of the shape of the jaws and denticles in the masticatory border. **d** Medium part of the masticatory border showing the uniform rows of denticles



system, to the right side where it opens ventrally into the stomach (Fig. 5b). The small stomach is surrounded by the digestive gland and covered dorsally by the cardiac area. Stomach plates are not present. The wide intestine originates dorsally from the stomach, making a turn to the right to end in the anal papillae (Fig. 5a). The digestive gland consists of a single mass occupying more than half the visceral mass. It has a granulated and white appearance in fixed animals.

The cerebral and pleural ganglia are fused, but they are clearly differentiated from the pedal ganglia (Fig. 5c). The pedal commissure is very short, while the buccal commissure is more developed. The buccal ganglia are oval in shape and are located over the posterior ventral part of the buccal bulb (Fig. 2a).

The heart (Fig. 5a) is formed by a wide auricle and an elongated ventricle, lying within the pericardium. The structure is flat and membranous, and it is situated on

**Table 3** Comparative morphological features of the species of the genus *Tritonia* from Antarctic and sub-Antarctic areas (data from Wägele 1995 and this study)

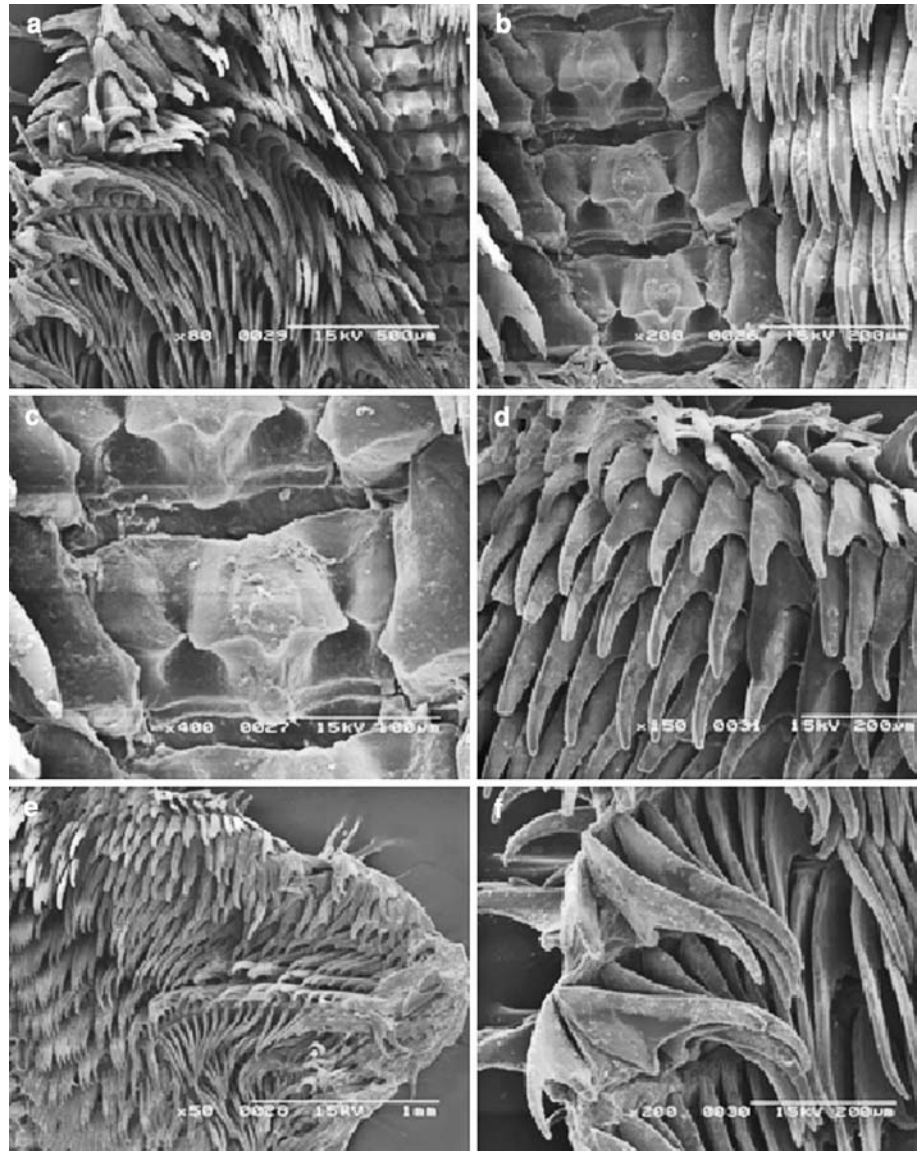
Characteristics	<i>T. vorax</i>	<i>T. challengeriana</i>	<i>T. dantarti</i> sp. n.
Size when fixed (mm)	22–60	23–65	18–33
Coloration	White, rose, cream	White, yellow, brown	Bright orange/white
Dorsal surface	Smooth <sup>a</sup>	Warty	With crests <sup>b</sup>
Oral lips	Absent	Present <sup>c</sup>	Present
Number of velar processes	> 15	< 15	< 15
Number of gill clusters per side	20–40	6–12	20–33
Size of gill clusters	Tiny and small	Small and medium	Large and small
Shape of gill clusters	Dichotomous	Digitated	Highly ramified
Radular rows	54–71	31–46	30–38
Number of lateral teeth in radula	79–115	37–63	35–48
Jaw/body length proportions	> 0.4	≈ 0.25	0.27
Salivary glands	Long, ribbon-like	Long, ribbon-like	Small, elongated

<sup>a</sup>Occasionally few warts or ridges

<sup>b</sup>Sometimes also warts in the posterior part

<sup>c</sup>Not always visible

**Fig. 4** *Tritonia dantarti* sp. n. Scanning electron micrographs of the radular teeth. **a** General view of the left hemiradula showing rhachidian and very thin and long lateral teeth. **b** Rhachidian and the first lateral teeth. **c** Detail of the tricuspidate rhachidian and differentiated first lateral. **d** Detail of the hooked marginal teeth on the right hemiradula. **e** Posterior part of the radula showing the marginal and the lateral teeth. **f** Detail of the marginal teeth of the central right hemiradula



the dorsal medium part of the viscera, just on top of the stomach.

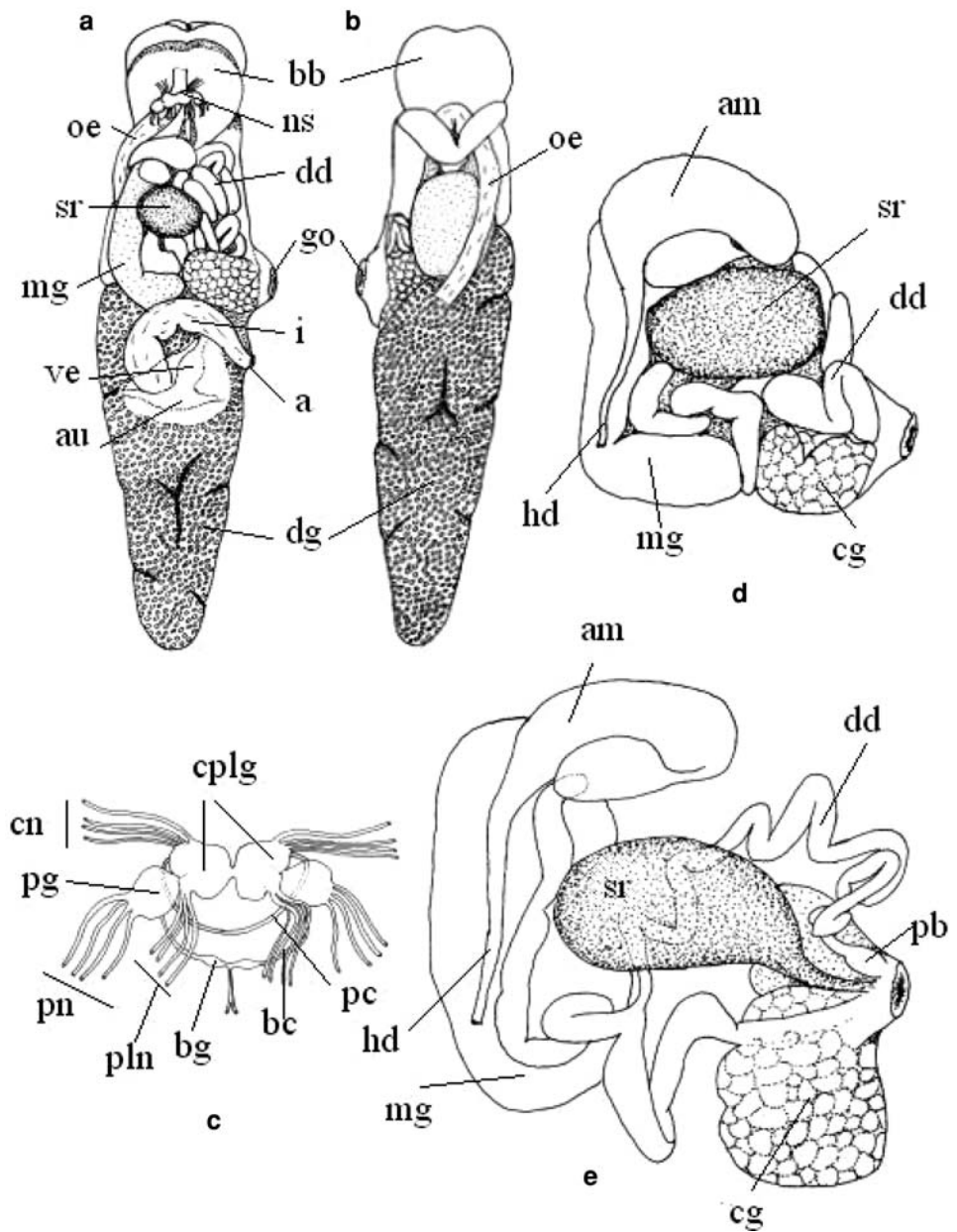
The genital system (Fig. 5d, e) occupies the anterior third of the visceral mass, between the buccal bulb and the digestive gland. The whole system is white except for the seminal receptacle which is opaque grey. The genital mass measures 9 mm×4 mm in the 28 mm specimen, and 7.5 mm×5.5 mm in the 22 mm specimen. The gonad tissue cannot be distinguished from the digestive gland. The hermaphroditic duct is narrow and widens into a distinct and wide ampulla before dividing into the male and female parts. The male duct is long, narrow and very coiled, and runs to the opening of the penial papillae. The oviduct is also coiled, distally wide, narrowing just before opening into the vaginal duct. The mucous gland is white and well developed, surrounding the rest of the genital system in the ventral and left sides. The capsule gland has a granulated appearance and covers the distal part of the oviduct. The more apparent

structure is the voluminous seminal receptacle (Fig. 5d, e), which is grey, pear-like, and opens into the genital atrium by a short duct.

## Discussion

The specimens of *Tritonia dantarti* sp. n. collected at Bouvet Island were all found at only one station. The material from the trawl obtained from this station (PS65/028-1) indicated that *T. dantarti* sp. n. lives in an area dominated by ophiuroids (*Ophionotus victoriae* and others), seastars (*Porania antarctica*), orange holothurians (*Ekmocucumis* cf. *steineni*), sedentary polychaetes with calcareous tubes, hydroids, pink alcyonarians, different actinian species, amphipods and picnogonids (Arntz et al. 2005, this volume). From these invertebrates associated with the record of *Tritonia*, the pink, unidentified alcyonarians seem most likely to be the prey

**Fig. 5** *Tritonia dantarti* sp. n. Internal anatomy. **a** General dorsal view, **b** general ventral view, **c** nervous system, **d** reproductive system in situ, **e** reproductive system dissected. (*a* anus, *am* ampulla, *au* auricle, *bb* buccal bulb, *bc* buccal commissure, *bg* buccal ganglia, *cg* capsule gland, *cn* cerebral nerves, *cplg* cerebropleural ganglia, *dd* deferent duct, *dg* digestive gland, *go* genital opening, *hd* hermaphroditic duct, *i* intestine, *mg* mucous gland, *ns* nervous system, *oe* oesophagus, *pb* penial bulb, *pc* pedial commissure, *pg* pedial ganglia, *pln* pleural nerves, *pn* pedial nerves, *sr* seminal receptacle, *ve* ventricle)



of *T. dantarti* sp. n. (although it has not been proven yet), since tritoniids, as well as other dendronotaceans, often feed on softcorals.

The tritoniidae family consists of soft, elongated nudibranchs, usually with branched secondary gills along the mantle border, possessing an oral veil with protuberances, and a broad radula with a median tooth and numerous lateral teeth (Marcus 1983). Usually they feed on a single species of soft corals or gorgonians (Smith and Gosliner 2003). Within the family tritoniidae, *Marionia* is the only genus with the digestive gland divided into two distinct masses, while *Marioniopsis*, *Tritonia*, *Paratritonia*, *Tritoniella* and *Tritoniopsis* possess one single mass in the digestive gland (Odhner 1934, 1936, 1963; Willan 1988). Our specimens possess only

one digestive gland mass, and thus, the genus *Marionia* was discarded. Furthermore, *Marionia* and *Marioniopsis* do have cuticular stomach plates (Odhner 1934, 1936, 1963; Marcus 1983), while our specimens did not present them either, and therefore the genus *Marioniopsis* was also discarded. The genus *Tritoniella* has no gills (Wägele 1989), excluding our specimens from this genus as well. Thus, only the genus *Tritonia* and *Tritoniopsis* remain as a possibility for our specimens. The rhachidian tooth provides the clue for distinguishing between the two genera. The rhachidian tooth is unicuspidate (and the first lateral is not different than the rest) in *Tritoniopsis*, while it is tricuspidate (and the first lateral is different than the rest) in *Tritonia* (Odhner 1934; Marcus 1983). The specimens described here as

**Fig. 6** Comparison between *T. dantarti* sp. n. and *Tritonia challengeriana*. **a** *T. dantarti* n.sp. living animal, **b** *T. challengeriana*, living animal, **c** *T. dantarti* sp. n. anterior part of the body, **d** *T. challengeriana*, anterior part of the body, **e** *T. dantarti* sp. n., preserved animal, **f** *T. challengeriana*, preserved animal



*T. dantarti* sp. n. clearly fit these characteristics for the genus (see Figs. 2, 4), fulfilling both criteria: tricuspidate rhachidian and first lateral differentiated.

The genus *Tritonia* presents at least 20 species distributed all around the world. From these, several species had been reported from Antarctica in the past, although they were all reduced to only two valid species by Wägele (1995) and Schrödl (2003). These two species are *T. challengeriana* and *T. vorax*. *T. vorax* is clearly different from both *T. dantarti* sp. n. and *T. challengeriana* because it presents giant jaws (Wägele 1995; Schrödl 2003). *T. dantarti* sp. n. differs clearly from the other two species by the external morphology, notum, large dendritic gills, body shape, coloration and dorsal crests (Table 3, Fig. 1). The differences with respect to *T. challengeriana* are quite obvious when comparing them with other two species (Fig. 6). Also, both species differ in the number of velar processes, number of gill clusters per side, size and shape of gills (Table 3). Not only the gills in *T. dantarti* sp. n. are more abundant, larger and more ramified, but also their orientation (laterally and vertically in the new species) differs. With

respect to internal anatomy, *T. dantarti* sp. n. also differs in the size and shape of the lateral radular teeth and the shape and size of the salivary glands. The pear-like seminal receptacle seems to be very characteristic in *T. dantarti* sp. n. Furthermore, all specimens of *T. dantarti* sp. n. have a longer body with a narrower dorsum than any *T. challengeriana* specimens from Bouvet Island, the Weddell Sea or the Antarctic Peninsula as observed by the authors or described by others (Wägele 1995; Schrödl 2003). Although specimens turned completely white after several months of fixation and the crests disappeared, still the body shape and quadrangular cross section are clearly distinct in *T. challengeriana* and *T. vorax* (Fig. 6).

On the other hand, other two species reported from the South American region, such as *Tritonia odhneri* and *Tritonia* sp. 1 from Schrödl (2003), are morphologically and anatomically very different from *T. dantarti* sp. n. in many aspects, and furthermore, they have completely different geographical distributions (Schrödl 2003).

The Antarctic species *T. challengeriana* is also reported here for the first time from Bouvet Island, while

the Subantarctic species *T. vorax* and the South American species *T. odhneri* have not been found at Bouvet Island. These may be an indication that Magellanic *Tritonia* species (Schrödl 1999, 2003) do not reach Bouvet Island, while the Antarctic species *T. challengeriana* does. The Tritoniids from Bouvet Island, therefore, share more similarities with the Antarctic fauna.

Within the genus *Tritonia*, *T. dantarti* sp. n. is the only species presenting a bright orange coloration with the characteristic dorsal crests (Figs. 1a, b, 6c). Since *T. dantarti* sp. n. has only been reported from Bouvet Island so far, it is therefore suggested to be an endemic species.

**Acknowledgements** Thanks are due to A. Corbacho and S. Taboada for helping with the bibliography. We also thank C. Debenham, T. Brey, W. Arntz and the crew of R/V “Polarstern”. We are thankful for the support of the ECOQUIM projects (REN2003-00545 and REN2002-12006-E ANT). We thank S. Thatje, H. Wägele and M. Schrödl for reading and improving the first draft of this paper.

## References

- Arntz WE, Brey T (2005) The expedition Antarktis XXI/2 of RV Polarstern in 2003–2004. *Ber Polar Meeresforsch* 503:1–149
- Arntz WE, Thatje S, Linse K, Avila C, Ballesteros M, Barnes DKA, Cope T, Cristobo Rodríguez FJ, De Broyer C, Gutt J, Isla E, López-González P, Montiel A, Munilla T, Ramos Esplá A, Raupach M, Rauschert M, Rodríguez E, Teixidó N (2005) Missing link in the Southern Ocean: sampling the marine benthic fauna of remote Bouvet Island. *Polar Biol* (this volume)
- Avila C, Ballesteros M, Debenham C (2005) Chemical ecology of Antarctic invertebrates. In: Arntz WE, Brey T (eds) The expedition Antarktis XXI/2 of RV Polarstern in 2003–2004. *Ber Polar Meeresforsch* 503:68–72
- Dell RK (1990) Antarctic Mollusca: with special reference to the fauna of the Ross Sea. *Bull R Soc N Z* 27:1–311
- Linse K (2005) New records of shelled marine molluscs at Bouvet Island and their biogeographic affinities. *Polar Biol* (this volume)
- Marcus EBR (1983) The Western Atlantic Tritoniidae. *Bolm Zool Univ S Paulo* 6:177–214
- Odhner NH (1926) Die Opisthobranchien. *Further Zool Res Swed Antarctic Exped 1901–1903*, 2:1–100
- Odhner NH (1934) The Nudibranchiata. *British Antarctic “Terra Nova” Expedition, 1910. Zoology. Mollusca, Polychaeta, Chaetognata*, vol VII. *British Museum Natural History, London*, pp 229–309
- Odhner NH (1936) Nudibranchia Dendronotacea. A revision of the system. *Mem Mus Roy Hist Nat Bel* 2(3):1057–1128
- Odhner NH (1963) On the taxonomy of the Family Tritoniidae (Mollusca: Opisthobranchia). *Veliger* 6:48–52
- Schrödl M (1999) Zoogeographic relationships of Magellan Nudibranchia (Mollusca: Opisthobranchia) with particular reference to species from adjacent regions. *Sci Mar* 63(Suppl 1):409–416
- Schrödl M (2003) Sea slugs of southern South America. Systematics, biogeography and biology of Chilean and Magellanic Nudipleura (Mollusca: Opisthobranchia). *ConchBooks, Hackenheim*
- Smith VG, Gosliner TM (2003) A new species of *Tritonia* from Okinawa (Mollusca: Nudibranchia), and its association with a gorgonian octocoral. *Proc California Acad Sci* 54(16):255–278
- Wägele H (1989) On the anatomy and zoogeography of *Tritoniella belli* Eliot, 1907 (Opisthobranchia, Nudibranchia) and the synonymy of *T. sinuata* Eliot, 1907. *Polar Biol* 9:235–243
- Wägele H (1995) The morphology and taxonomy of the Antarctic species of *Tritonia* Cuvier, 1797 (Nudibranchia, Dendronotoidea). *Zool J Linn Soc* 113:21–46
- Willan RC (1988) The taxonomy of two host-specific, cryptic dendronotoid nudibranch species (Mollusca: Gastropoda) from Australia including a new species description. *Zool J Linn Soc* 94:39–63