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# A New Species of *Tritonia* from Okinawa (Mollusca: Nudibranchia), and its Association with a Gorgonian Octocoral

**Victor G. Smith and Terrence M. Gosliner**
*Department of Invertebrate Zoology & Geology, California Academy of Sciences,*
*Golden Gate Park, San Francisco, CA 94118*

**A new species of tritoniid nudibranch is described. *Tritonia bollandi* sp. nov. is known from its type locality of Seragaki Tombs, Okinawa, and from Indonesia, and has been found at depths of 58 to 75 m. The animal reaches 88 mm in length, and mature specimens are olive green in color, with lighter colored branchial plumes, nearly white rhinophores, and a thin white margin along the notal margin. The body appears granular due to the presence of small low tubercles on all parts of the body, except for the foot. The oral veil is slightly bilobed and bears 12 to 14 elongate digitiform processes, many of which are apically bifid. The notal margin extends along and slightly overhangs the sides of the body. From the notal margin are produced 9 to 14 pairs of arborescent branchial plumes, and the sheaths of the rhinophores, whose margins are undulate and flange-like. The rhinophore shafts are retractable, and are palmate in appearance, with a central clavus surrounded by a stepped series of pinnate processes. External genitalia are on the right side of the animal, behind the third anterior branchial plume. The anus and nephroproct are also on the right side, behind and just below the 4th branchial plume, close to the notal margin. The anterior foot margin is rounded. Buccal armature includes a pair of jaws with 2 to 4 rows of microscopic denticles along the masticatory border. The radula has a tricuspid rachidian, a differentiated first lateral tooth, and a series of hamate to falcate lateral teeth. There are no cuticular plates within the stomach. *Tritonia bollandi* sp. nov. has been observed to feed upon gorgonian octocorals of the family Ellisellidae (Gray, 1859), in particular *Verrucella aurantia* (Gray, 1869). Sclerites produced by the octocoral were isolated from nudibranch digestive system contents and compared with sclerites isolated from octocoral samples, providing further evidence of the association between *Tritonia bollandi* sp. nov. and the octocoral family Ellisellidae. This is the first record of predation by a nudibranch on this family of octocoral.**

During 1995 and 1997, eight specimens were collected by Robert F. Bolland while scuba diving at a site off the island of Okinawa. With one exception, all of these specimens were found in association with a red gorgonian octocoral. Two of the specimens were observed by the collector to be feeding on the gorgonian, and five other specimens were found on this gorgonian. Specimens of the gorgonian were collected along with the nudibranchs in almost all cases, and in one case a nudibranch egg mass was collected on the gorgonian sample taken near the nudibranch. Detailed examination of the morphology and anatomy of the nudibranch specimens indicate they belong to the genus *Tritonia*. Comparison was made between the specimens with descriptions of similar species, as well as direct comparison of the morphology with a type specimen of a similar, described species from Indonesia (*Tritonia olivacea* Bergh, 1905). *Tritonia bollandi* sp. nov. does not match this or any other previously published descriptions of tritoniids, and is described herein.

Nudibranchs of the family Tritoniidae are well documented as feeding on octocorals, including sea pens, soft corals and gorgonians (McDonald and Nybakken 1999). In many cases, the feeding may be limited to a single species or family. Animals are often cryptic upon their prey species. Substances sequestered from their prey (Avila et al. 1999) may chemically protect other species. Unless an animal has been seen directly feeding on a prey species, it can be difficult to connect it to a specific prey. In this study, direct observation of feeding is combined with collections and photographs of associated prey. In addition, digestive tract contents provide sclerites of the prey coral, allowing direct comparison among samples, and identification of the prey octocoral as belonging to the family Ellisellidae Gray, 1859. This is the first record of a nudibranch feeding on this family of gorgonians.

**METHODS**.— Nudibranchs were relaxed in ethylene phenoxytol, fixed in 10% buffered formalin for 24 hours, then transferred to 75% EtOH. Coral specimens were placed directly into 75% EtOH. Anatomical drawings have been produced with the aid of a drawing tube attached to a binocular dissecting microscope. Dissections of the animals have been performed by a ventral incision through the length of the sole of the foot and around the genital and anal openings, allowing the removal of the entire visceral mass in one piece. Jaws and radulae were freed from the buccal masses by partially dissolving them in 10% KOH solution. Digital photos of corals, egg mass, and jaws were produced using a MDS100 Kodak digital camera. Jaws and radulae were air dried, then mounted on aluminum stubs and sputter-coated with a mixture of gold and palladium in preparation for electron microscopy. Scanning electron micrographs (SEMs) were taken using a Hitachi S-520 Scanning electron microscope, then scanned into a Macintosh computer system and edited using Adobe Photoshop™ 5.5. Digestive contents and coral samples were treated with undiluted household bleach to dissolve the tissue, releasing the sclerites. Sclerites were then collected with micropipettes, washed 3 times in de-ionized water, then rinsed in 75% EtOH. Samples were then dispersed on aluminum stubs, and sputter coated with gold/palladium for scanning electron microscopy, and also made into permanent glass slides for optical microscopy.

## SPECIES DESCRIPTION

### Suborder Dendronotacea Odhner, 1934

### Family Tritoniidae Lamarck 1809

### *Tritonia* Lamarck, 1801

***Tritonia bollandi* Smith and Gosliner, sp. nov.**

Tritoniid sp. 8, Rudman, 2003.

**TYPE MATERIAL**.— All type material has been deposited at California Academy of Sciences Department of Invertebrate Zoology (CASIZ). All material was collected by Robert F. Bolland at Seregaki Tombs 26.00°30.40′N 127.00°52.60′E, Okinawa, on a substratum of mixed sand and coral rubble. Holotype: CASIZ 105327, 85 mm in length, collected 12 May 1995 at 64 meters along with sample of octocoral upon which it was found. Paratypes: CASIZ 105302, 88 mm in length, dissected, collected 7 July 1995 at 75 m along with sample of octocoral upon which it was feeding. CASIZ 115750, 69 mm in length, dissected, collected 4 May 1997 at 58 meters from a partially eaten octocoral; CASIZ 105329, 17 mm in length, collected 7 July 1995 at 75 meters along with sample of octocoral upon which it was feeding; CASIZ 105300, 88 mm in length, collected 3 August 1995 at 74 meters along with sample of octocoral upon which it was found; CASIZ 115738, 65 mm in length, collected 1 March 1997 at 72 meters along with egg mass and octocoral sample upon which it was found; CASIZ 115821, 82 mm in length, collected at 59 meters.

**ADDITIONAL MATERIAL EXAMINED**.— Zoölogisch Museum, Universiteit van Amsterdam (ZMA), paratype of *Tritonia olivacea* Bergh, 1905, 17 mm in length collected on the Siboga Expedition by Bergh, with an additional pair of jaws, possibly from the holotype, which is missing.

**EXTERNAL MORPHOLOGY**.— The largest specimen (CASIZ 105302) was 88 mm in length in life (Figs.1a–b) This preserved specimen is 73 mm in length, 12 mm across widest portion of notum, and 12 mm from top of notum to bottom of foot. The body is elongate and limaciform, with greatest diameter just anterior to mid-body. Another preserved specimen (CASIZ 115750) measured 47 mm in length, and 10 mm in width and height (Figs. 2a–b). Posterior to mid-body the animals taper gradually to the posterior end of the foot. The body shape is trapezoidal in cross-section, with the widest portion being the notum. Color in life ranges from nearly white to dark olive green with some preserved specimens retaining some of this olive green coloration. The paratype illustrated in Figures 1a and 1b shows a thin white margin along the edge of the notum, with nearly white rhinophoral shafts and lighter colored branchial plumes. All of the preserved animals show some degree of translucency, with some details of the internal organs visible through the body wall. The preserved animals all have a finely granular texture due to the small rounded low tubercles present on the body surfaces except the foot. Anterior to the foot and rhinophores is the characteristic oral veil (also referred to as the frontal veil or velum) extending forward from around the mouth opening. The velum is a flattened contractile projection, somewhat bilobed in form with elongate digitiform processes produced along the margins of each lobe. There are 6 or 7 processes on each lobe, the outermost on each side consisting of an oral tentacle with a distinct groove and a spatulate or rolled distal portion. Of the remainder, the most medial processes are always the shortest, increasing in length to the 3rd or 4th process, then generally decreasing in length to the 5th or 6th on each side. Some or all of the velar processes are apically bifid. In general the longer ones show this tendency more (Fig. 2b). The edges of the notum extend out slightly over the body, forming a distinct notal margin or ridge. From this margin are produced the sheaths of the rhinophores (Fig. 2c) and the branchial plumes (Fig. 2d). The notal margin extends up the sides of the widely spaced, tubular rhinophoral sheaths. The margins of the rhinophoral sheaths are simple and undulate. In most of the specimens examined, the flange is anteriorly lower, giving a notched appearance, and is more expanded at the posterior margin, where it tended to fold over or extend somewhat. The rhinophore shaft is contractile within the sheath. The shape of the rhinophore is characteristic of the family, and has been described by various workers as palmate. A central digitiform clavus arises from the apex of the shaft, surrounded by a series of bi-pinnately divided projections, lowest in the anterior portion and rising in a stepped fashion posterolaterally (Fig. 2c). There are 9 to 14 distinctive arborescent branchial plumes per side on the animals examined. A thickened trunk extends from the notal margin forming the base of each plume, dividing to produce 5 radial branches, each of which then divides 2 or more times to terminate in simple pinnate processes (Fig 2d). The largest and most developed plumes are just anterior to the mid-body, and the plumes are smaller and more simply developed towards the anterior and posterior of the animal. The external mouth opening is a ventral longitudinal slit anterior to the foot, surrounded by labia (Fig 2b). The foot is linear and narrow, with a bluntly rounded anterior margin. The basal, medial portion of the foot is smooth, and the anterior portion in the area below the buccal mass is wider than the remainder of the foot, which tapers acutely at the tail. A labiate margin surrounds the basal portion of the foot, and is distinctly wider in this anterior, buccal portion. The interior portion of the foot margin is rugose, showing fine longitudinal folds. The external genitalia are on the right side of the animal, located posterior to the third anterior branchial plume at approximately the midline of the side of the body (Figs. 1a, 2f). The largest projection is the most ventral, and consists of a folded skin flap surrounding the oviduct. The gonopore occurs dorsal to this flap, and near it is the small penial papilla. The anus is located posterior to the fourth branchial plume, close to the notal margin, and is at the apex of a short, tubular anal papilla. The nephroproct is located just anterior to the anus, on the same plane as the anal opening (Fig. 1a).

**INTERNAL ANATOMY**.— Dissection of two specimens (CASIZ 115750 and 105302) provides the basis for anatomical descriptions.

Digestive system: The muscular buccal mass is white, with some reddish tinge from the jaws showing through. The jaw arches are exposed, and are visible on the dorsal aspect of the buccal mass. Situated along either side of the posterior margin of the buccal mass is a pair of floccose salivary glands. From the ventral aspect, a thin-walled transparent aorta extends from the posterior margin of the buccal mass posteriad to the pericardial region (Fig. 3). The buccal armature consists of a pair of jaws and a radula. The jaws are translucent, reddish brown in color, and stout, with the masticatory edge folded over and not serrate. The pair measured (CASIZ 115750) was 6.25 mm long by 6.875 mm wide, before drying. The jaws of another paratype (CASIZ 105302) were not measured before drying but were somewhat larger (Figs. 7a–b). The masticatory borders appear smooth to the naked eye, but SEM images (Figs. 4a–d) reveal the presence of two to four rows of denticles on the masticatory borders. The more newly formed denticles (Figs. 4d–e) possess multifid distal ends, with the older ones (Figs. 4a–b) appearing peg-like. The radular formulae are 66 × (78.1.1.1.78) and 55 × (59.1.1.1.59) for CASIZ #s 105302 (Figs. 5a–d) and 115750 (Figs. 6a–d), respectively. The base of the rachidian is roughly rectangular. The rachidian tooth is tricuspid, with the central cusp being largest. The emarginate central cusp is sharply acuminate, with a thickened central ridge adding structural support. In many cases there is some folding at the shoulders of the central cusp. The two shorter outer cusps are stouter and blunter than the central cusp, and curve inward towards it. Some of these outer cusps show considerable distal folding, while others are more simple in form. The first lateral tooth on each side is differentiated from the remainder, being stout and blunt in comparison to the remainder of the sharper, hamate outer laterals. These innermost laterals have folds and thickenings that give them a buttressed appearance, with the holotype showing a distinct peg-like ridge. The remaining laterals on each side are hamate, with sharp points. Those closest to the rachidian are stouter, gradually becoming finer and more blade-like towards the outer margins of each half-row.

The gross anatomy of the visceral mass is illustrated in Figure 3. The esophagus exits from the dorso-medial buccal mass, arching posteriad. Beyond the ganglia and the encircling nerve ring, the esophagus narrows before turning to the left and enlarging into a crop-like sac. There are fine spots of greenish pigment dispersed on portions of the esophagus and crop, as well as the stomach and intestine of one of the animals dissected. The inside of the crop has a girdle of longitudinal folds and ridges, but is devoid of any chitinous plates. The crop narrows, and opens ventrally into the narrow proximal portion of the esophagus. Continuing posteriad in a straight line, it passes through a groove dividing the ventral side of the genital mass, before widening and curving dorsally to enter the stomach. The major portion of the muscular stomach is visible on the dorsal side of the animal. It sits atop the genital mass and the smaller anterior digestive gland, nestled in a hollow in the anterior portion of the posterior digestive gland mass. It is completely uncovered by the digestive gland. The interior of the stomach has a series of longitudinal folds and ridges, but is devoid of chitinous plates. The stomach narrows and curves to the right, forming the intestine, which curves dorsally to terminate at the anus. The contents of the crop, esophagus, stomach and intestine contain bits of coral and digested material. The digestive gland consists of a smaller, anterior portion attached to a larger posterior lobe, each of which has separate ducts entering to the stomach. Though not shown in the illustration, approximately six openings in the posterior digestive glands give rise to thin-walled, transparent branchial aorta, which ramify, connecting with the bases of each branchial plume (Fig. 2e). These branchial aorta do not ramify into the branchial plumes.

**REPRODUCTIVE SYSTEM** (Fig. 8a).— The reproductive system is triaulic, with three separate genital openings, but with no duct connecting the vagina or bursa copulatrix to the female gland mass or oviduct. The ovotestis is difficult to discern by gross examination, but appears to lie on the surface of the digestive gland masses. The narrow, thin-walled hermaphroditic duct enters the muscular, "C" shaped ampulla. Distally, the ampulla connects with the female gland mass, and it is not possible to discern exactly where the duct divides into male and female branches.

The vas deferens exits from the female gland mass, terminating distally in an unarmed penial papilla. There is no discrete prostate gland, but the proximal portion of the vas deferens is thickened and glandular in appearance. The oviduct exits the female gland mass proximal to the vaginal opening. The female gland mass makes up the bulk of the reproductive system, consisting of the smaller albumen and the larger mucous and membrane glands. The muscular bursa copulatrix is rounded-elongate connecting to the vagina by a narrow duct that is approximately equal in length to the bursa.

**NERVOUS SYSTEM**.— The cerebral and pleural ganglia are well fused and are joined by short connectives to the pedal ganglia, which are joined by a paired circum-esophageal commisure (Fig. 8b). A pair of buccal ganglia (Fig. 8c) are present on the ventral esophagus, anterior to the circum-esophageal ring. The buccal ganglia are touching each other. Giant nerve cells are present on the surface of all the ganglia. A pair of sub-dermal eyes is present posterior to the bases of the rhinophore sheaths, each connected by a nerve to the cerebropleurals.

**EGG MASS**.— On the octocoral sample collected along with CASIZ 115738 is an egg mass, which likely belongs to this nudibranch. It is a white string about 0.5 mm across, wrapped around the branches of the coral sample (Fig.7c). There is a single egg per capsule. The white eggs are spherical and approximately 0.1 mm in diameter.

**DISTRIBUTION**.— *Tritonia bollandi* sp. nov. is only known from its type locality in Okinawa and from Indonesia (Rudman 2003).

**ETYMOLOGY**.— The species is named after Robert F. Bolland in recognition of his many contributions to the knowledge of invertebrate biodiversity, particularly the opisthobranchs.

**DISCUSSION**.— While searching the literature, a plate of *Tritonia olivacea* Bergh, 1905 (pl. XX, fig. 18) appeared to closely resemble *T. bollandi* (Fig. 7d). A translation of the original description (Bergh 1905) failed to provide enough information to determine if these animals were the same as those described in the present study. Although the holotype of *Tritonia olivacea* could not be located, a paratype specimen was obtained. Comparison of the specimens show significant differences in several important features. In *T. olivacea*, the oral veil has a total of 8 papillae, all simple, with dark pigmentation retained on the distal ends, while *T. bollandi* has 12 to 14 papillae, many of which are apically bifid and without pigmentation. The location of the genital and anal openings also differs between species, with *T. olivacea* having the external genitalia between the 4th and 5th branchial plume and the anus between the 5th and 6th, while in *T. bollandi* they are located between the 3rd and 4th, and 4th and 5th respectively. Other differences exist between the specimens, but it is difficult to determine which may be artifacts of fixation or preservation. A pair of jaws was sent along with the paratype, assumed to belong to the holotype or another paratype specimen. Examination under an optical microscope did not reveal any denticulation of the masticatory border, which is in agreement with Bergh's description, and differs from the denticulate jaw of *Tritonia bollandi* sp. nov.

Although the cosmopolitan family Tritoniidae is readily discerned by its general body shape, oral veil and characteristic rhinophore shape, it has presented many problems to workers trying to unravel its taxonomy and systematics. Early descriptions are poor, often lacking details of internal anatomy, and are usually without illustrations of the animal in life. Many of the Indo-Pacific species are relatively rare, adding to the difficulty of sorting out the tangle of named species that presently exist in the literature. To date, the bulk of the work of classification has been undertaken by Odhner (1936). He expanded this work by focusing on the Tritoniidae (Odhner 1963) in a publication that may have created more confusion than it resolved. At issue with some modern workers is the systematic importance of characters pertaining to the division of the digestive gland (Avila et al. 1999; Willan 1988; Wägele and Willan 2000). We agree with those who think that the progression from a holohepatic state to a distinctly lobed and/or branched cladohepatic state of the digestive gland represents a homoplasy within the nudibranchs. The relative homogeneity of reproductive and nervous system morphology within the Tritoniidae requires the finding of more meaningful characters from other sources. As fresh collection efforts are undertaken, perhaps molecular data can help unravel some of the problems with this group.

Until further work can be undertaken to review the taxonomy of the Tritoniidae, we will follow the basic taxonomic structure proposed by Odhner, and place our new species in the genus *Tritonia* based on the absence of stomach plates, the undivided digestive gland, radular form with tricuspid rachidian, blunt differentiated first lateral teeth, and simple hamate outer laterals, as well as the simple penial papilla.

## Introduction to Octocoral Study

Gorgonians are octocorals characterized by a tough, flexible axis composed of the scleroprotein gorgonin, with varying amounts of calcareous material included in the axis, as well as in the living tissue where it takes the form of sclerites. The family Ellisellidae Gray, 1858 is part of the group *Calcaxonia* Grasshoff, 1999, and is composed of gorgonians with a solid axis containing heavy calcareous deposits of calcite or aragonite. Sclerites in the shape of spindles, clubs and double heads are present in the fleshy covering of the axis (coenenchyme) as well as in the non retractable polyps (Brill et al. 1983; Bayer and Grasshoff 1994; Grasshoff 1999). Morphology of the sclerites, along with growth form is used in identification to species level. Gradations between these forms can make species identification of small samples difficult.

**Octocoral examined.**— Octocoral samples are either stored in the same bottle as the nudibranchs examined for the description, or were split out from the nudibranchs and assigned new numbers, and the catalog numbers are listed without repeating collection information already listed. CASIZ 115736 and CASIZ 115738 each had a sample of red octocoral upon which the animal was collected included in the same lot. CASIZ 105328 is a sample of red octocoral identified as Ellisellidae that had the animal in CASIZ 105327 associated with it. CASIZ 105330 is an ellisellid octocoral identified as *Verrucella aurantia* upon which was found the animal in CASIZ 105329. CASIZ 105303 and CASIZ 105300–105301, are also identified as *Verrucella aurantia* and are associated with CASIZ 105302 and CASIZ 105300 respectively. CASIZ 104850, 1 specimen identified as *Verrucella* sp., collected on mixed sand and coral rubble, 1.3 km ENE of Maeki-zaki, Seragaki Tombs, Okinawa, 14 April 1995, collected by Robert Bolland.

**Observations and results.**— CASIZ 105302, a paratype of *Tritonia bollandi* sp. nov. was photographed with its prey CASIZ 105303 (Fig. 1b) and was observed by the collector to be feeding upon it. Portions of the coral can be seen to be stripped of living material down to the axis. Sclerites from the digestive tract of the nudibranch (Fig. 10) are compared with sclerites taken directly from the octocoral sample (Fig. 11). A paratype of *Tritonia bollandi* sp. nov. (CASIZ

105329) was also observed by the collector to be feeding on the octocoral collected with it (CASIZ 105330). While this nudibranch specimen was not dissected to obtain digestive tract contents, the sclerites from the prey coral sample are shown in Figure 12. In the case of CASIZ 115738, a unique opportunity was presented to observe digestive tract contents without dissection. The nudibranch was collected along with the octocoral upon which it was found. Although the nudibranch was not observed feeding on the coral, parts of the sample appear to have been eaten. A large fragment of hard red material consisting of partially digested coral was found protruding from the anus of the nudibranch. SEM's of this material (Figs. 13a–b, e–f) show gorgonian sclerites, along with some ossicles belonging to an unidentified sea cucumber (Figs. 13c–d). Comparison with sclerites from the coral sample (Figs. 13g, i–k) shows similar sclerites in both samples. Figure 13h shows a sea cucumber ossicle similar to that collected from the nudibranch. The paratype CASIZ 115750 was collected from a partially eaten, unidentified octocoral. A specimen of the coral was not taken, but stomach contents are illustrated in Figure 16. The holotype (CASIZ 105327) was found on and collected with a small octocoral (CASIZ 105328). Figure 14 illustrates the sclerites from a sample of this coral. Paratype CASIZ 105300 was found on and collected with a coral sample represented by CASIZ 105301. Sclerites from this sample are illustrated in Figure 15.

The association between *Tritonia bollandi* sp. nov. and its prey is supported by several lines of evidence: direct observation of the nudibranch feeding upon the octocoral, observation of the nudibranch and/or its suspected spawn on the suspected prey, visual evidence of the coral having been stripped of living material, and comparison of sclerites from the digestive tract of nudibranchs with sclerites freed from octocoral samples. The strongest evidence for specific predation occurs with the holotype specimen, which was directly observed feeding. The prey species was subsequently identified as *Verrucella aurantia* (Gray, 1869) by Gary C. Williams of the California Academy of Sciences by means of sclerite morphology and growth form. Comparison of sclerites (both SEM and optical microscopy) from the digestive tract of the nudibranch with sclerites taken from the prey coral show a similarity of forms consisting of variations on the dumbbell and double head shape, with more or less distinct waist areas, free from tubercles. These forms intergrade with longer spindle shapes, some of which have no waist areas. The paratype CASIZ 105329 was also directly observed feeding on the octocoral (CASIZ 105330), also identified as *Verrucella aurantia* by growth form and sclerite morphology. CASIZ 105328 is the lot containing both the paratype nudibranch and the coral sample with spawn. Feeding was not observed, but comparison of sclerites show similar morphology. The appearance of the sclerites, as well as the growth form suggest that this coral is also *Verrucella aurantia*. The spawn mass found on the coral is consistent with nudibranch spawn, and suggests a close relationship between the nudibranch and coral. The presence of ossicles belonging to an unidentified sea cucumber (Gosliner et al. 1996:8; Lambert 1997) from both the coral and the nudibranch also strengthen the assumption that the nudibranch was feeding on this particular coral. It was suggested that these ossicles were incidental, probably stuck to the mucus found on the coral and ingested with it (G.C. Williams, pers. commun.). The remaining 3 specimens that were found associated with red octocorals all had sclerites from the corals that were similar to the others found, and while a species level identification is not possible it can be said with confidence that they belong to the family Ellisellidae, which consists of 10 genera. The absence of club shaped sclerites narrows the possible identification to the Ellisella group, which contains the genera *Ctenocella, Viminella, Ellisella, Verrucella,* and *Phenilia* (Grasshoff 1999).

**Discussion**.— The nudibranch *Tritonia bollandi* sp.nov. appears to be a specialist predator on gorgonian octocorals of the family Ellisellidae (Gray 1858) in general, and is known to feed in particular on *Verrucella aurantia* (Gray 1869). This is the first record of this family of octocoral being used as a nudibranch food source. Many members of the family Tritoniidae are known or suspected specialist predators on octocorals, often limited to a single species or group of species within a single family. In some cases, the nudibranch may be cryptic in form or coloration, becoming difficult to see on its host. This does not appear to be the case with *Tritonia bollandi* sp. nov., which contrasts sharply with the color of its prey. However, at the depth that these animals are found (56–75 meters) visibility probably becomes a moot point. Tritoniid nudibranchs may also utilize toxic or distasteful compounds sequestered from their prey as a means of discouraging their own predators (Avila et al. 1999; Gosliner and Ghiselin 1987; Gosliner et al. 1996; Willan 1998). At present, no chemical work has been done to see if this might be the case with these species.

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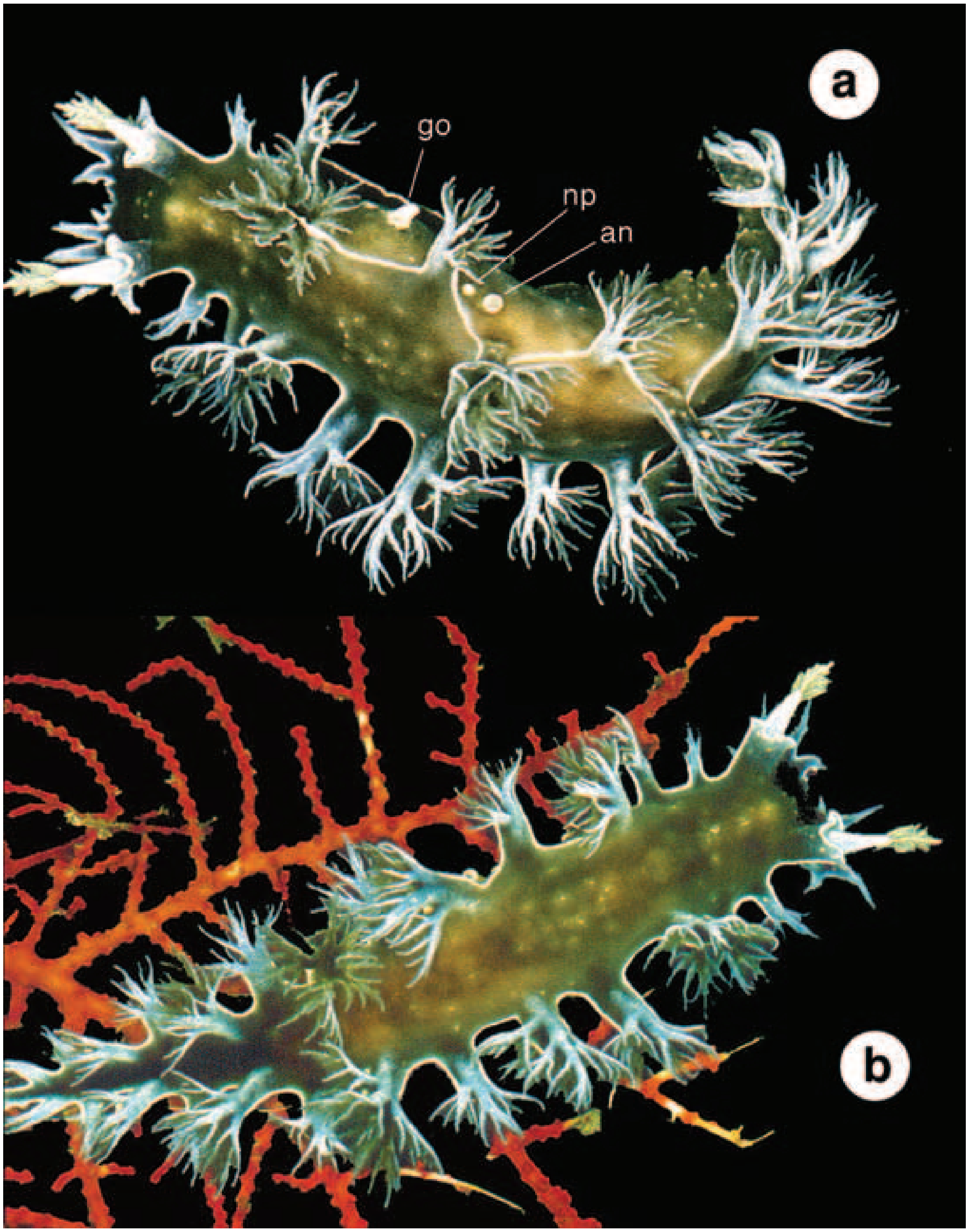

FIGURE 1.(a) Photograph of living animal (CASIZ 105302), 88 mm long, showing general structure and external features on right side. (b) Photograph of same specimen upon the octocoral it was found feeding on. an = anus; go = genital opening; np = nephroproct.

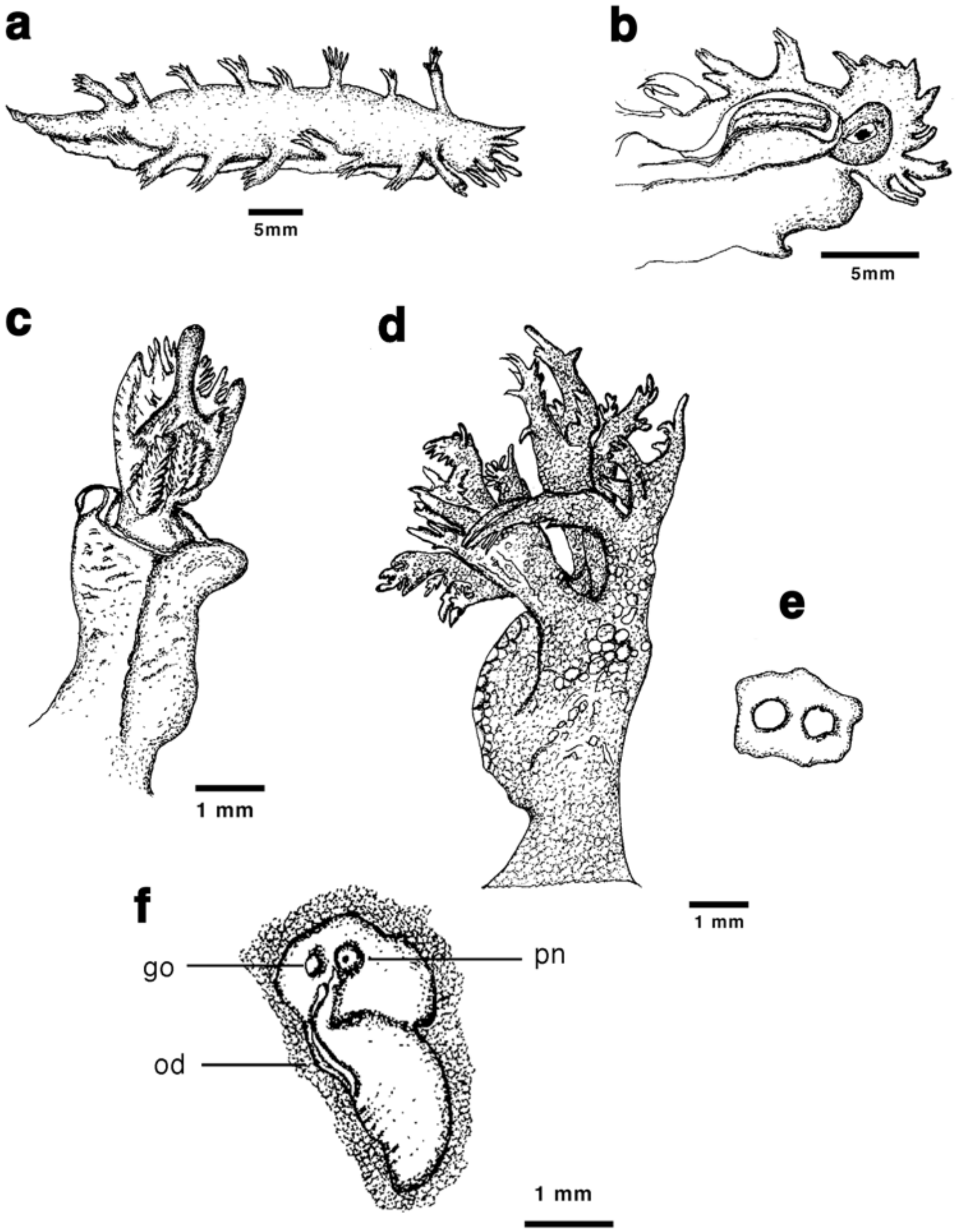

FIGURE 2. Paratype (CASIZ 115750) external features. (a) drawing of preserved specimen, dorsal view. (b) ventral view of anterior portion of animal, showing mouth, anterior foot, and oral veil. tg = tentacular groove. (c) detail of rhinophore. (d) detail of branchial plume. (e) detail of base of branchial plume, same scale as (d). (f) detail of external genitalia. go = gonopore; od = oviduct; pn = penial papilla.

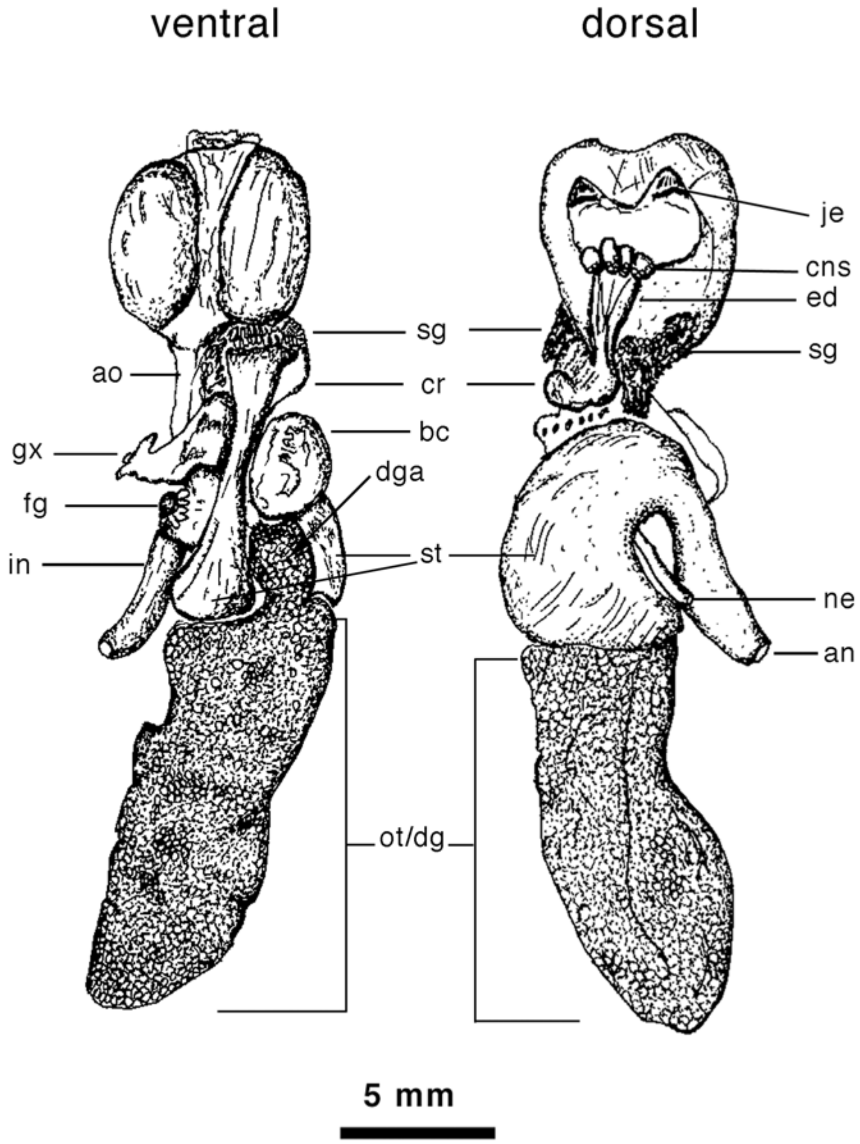

FIGURE 3. Visceral mass of paratype (CASIZ 115750) in ventral and dorsal views. an = anus; ao = aorta; bc = bursa copulatrix; cns = central nervous system; cr = crop; dga = anterior digestive gland; ed = distal esophagus; fg = female gland mass; gx = external genitalia; in = intestine; je = jaw edge; ne = nephroproct; ot/dg = ovotestes/digestive gland; sg = salivary glands; st = stomach.

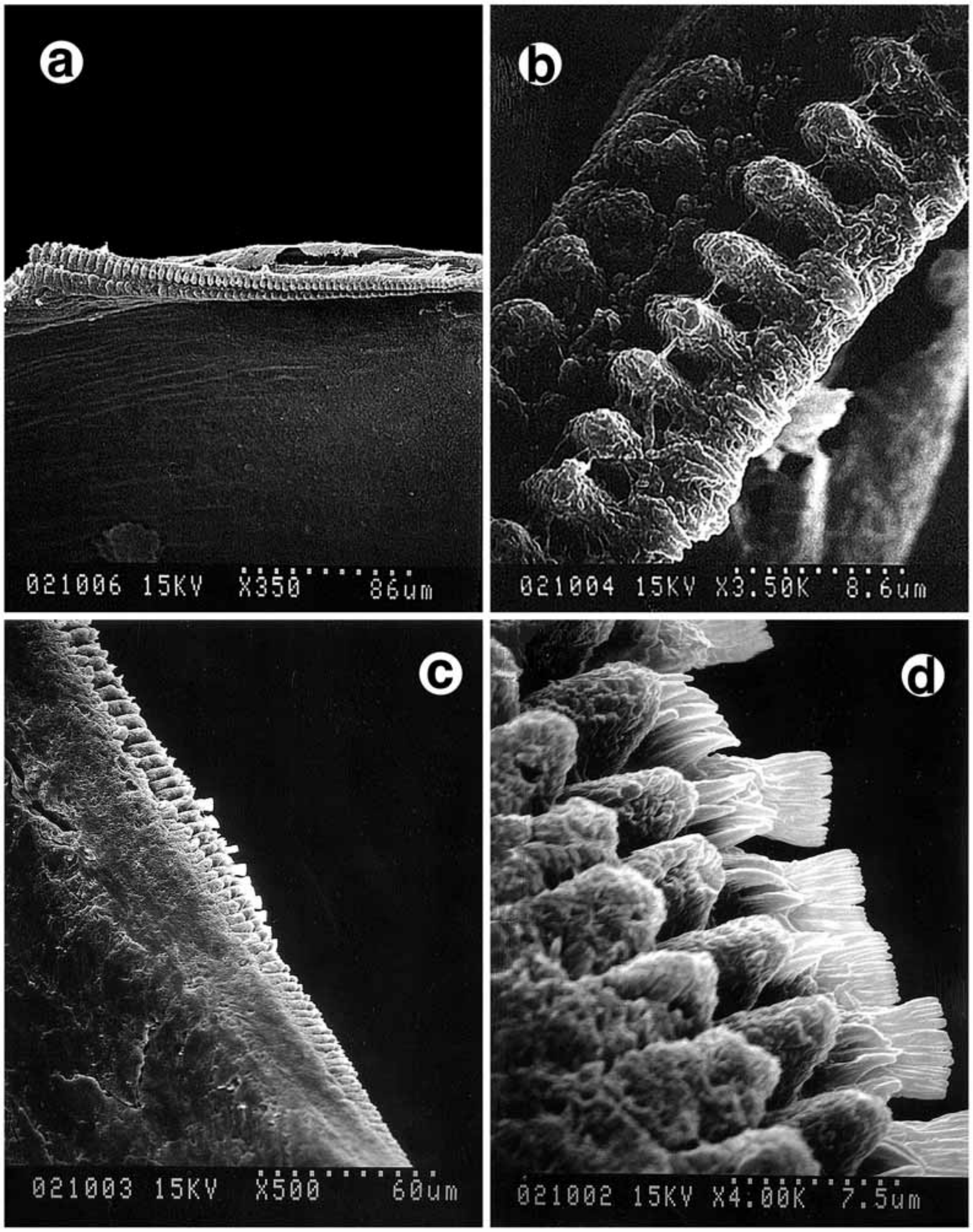

FIGURE 4. (a–b) SEM's of masticatory border of CASIZ 115750. (c–d) SEM's of masticatory border of CASIZ 105302, showing older, worn peg-like structures and newer multifid denticles.

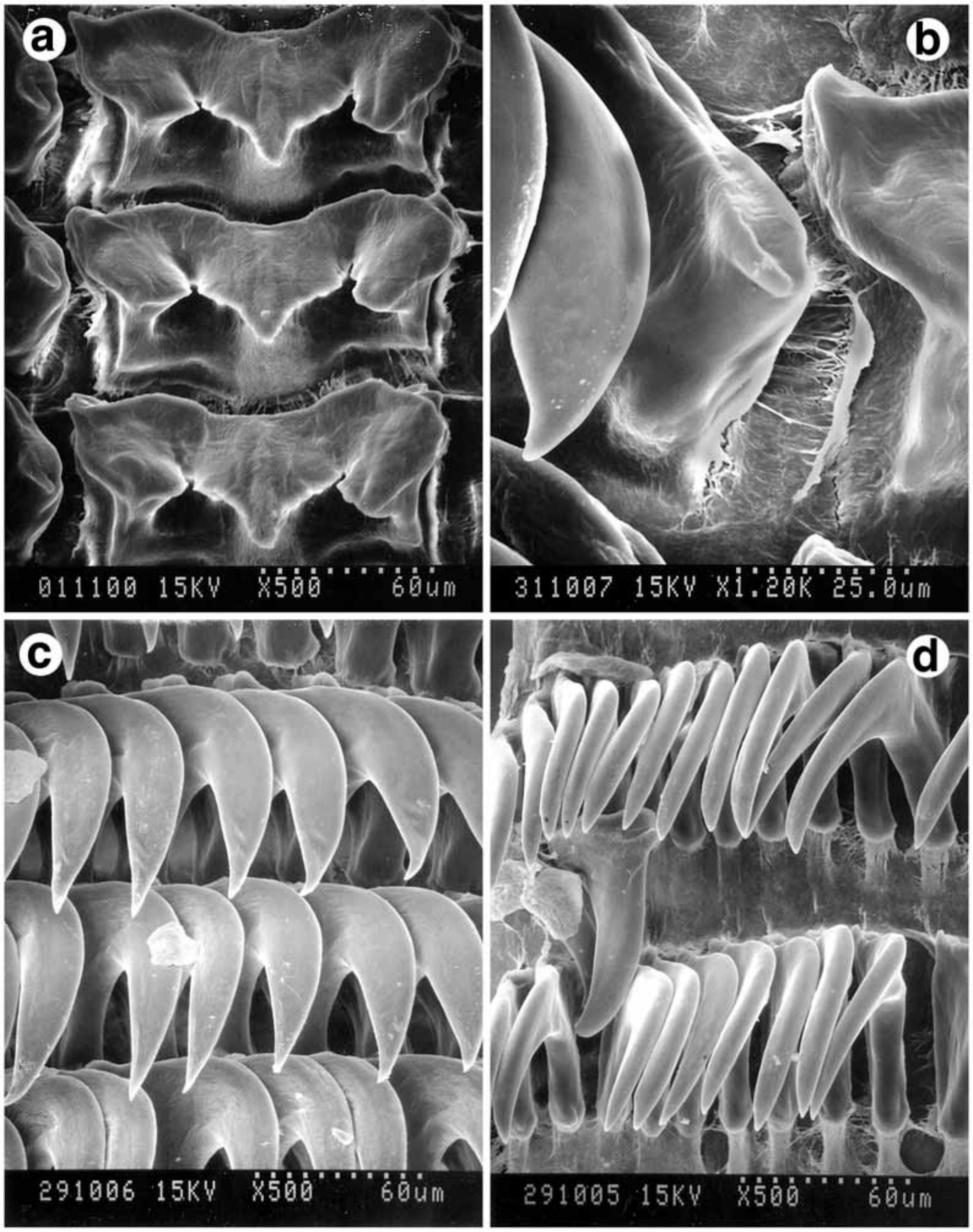

FIGURE 5. SEM's of radula of CASIZ 105302. (a) Rachidian teeth and first laterals near new end of radula. (b) Detail of first lateral and first inner lateral. (c) Inner lateral teeth of portion of half-row. (d) Outer lateral teeth of portion of half-row.

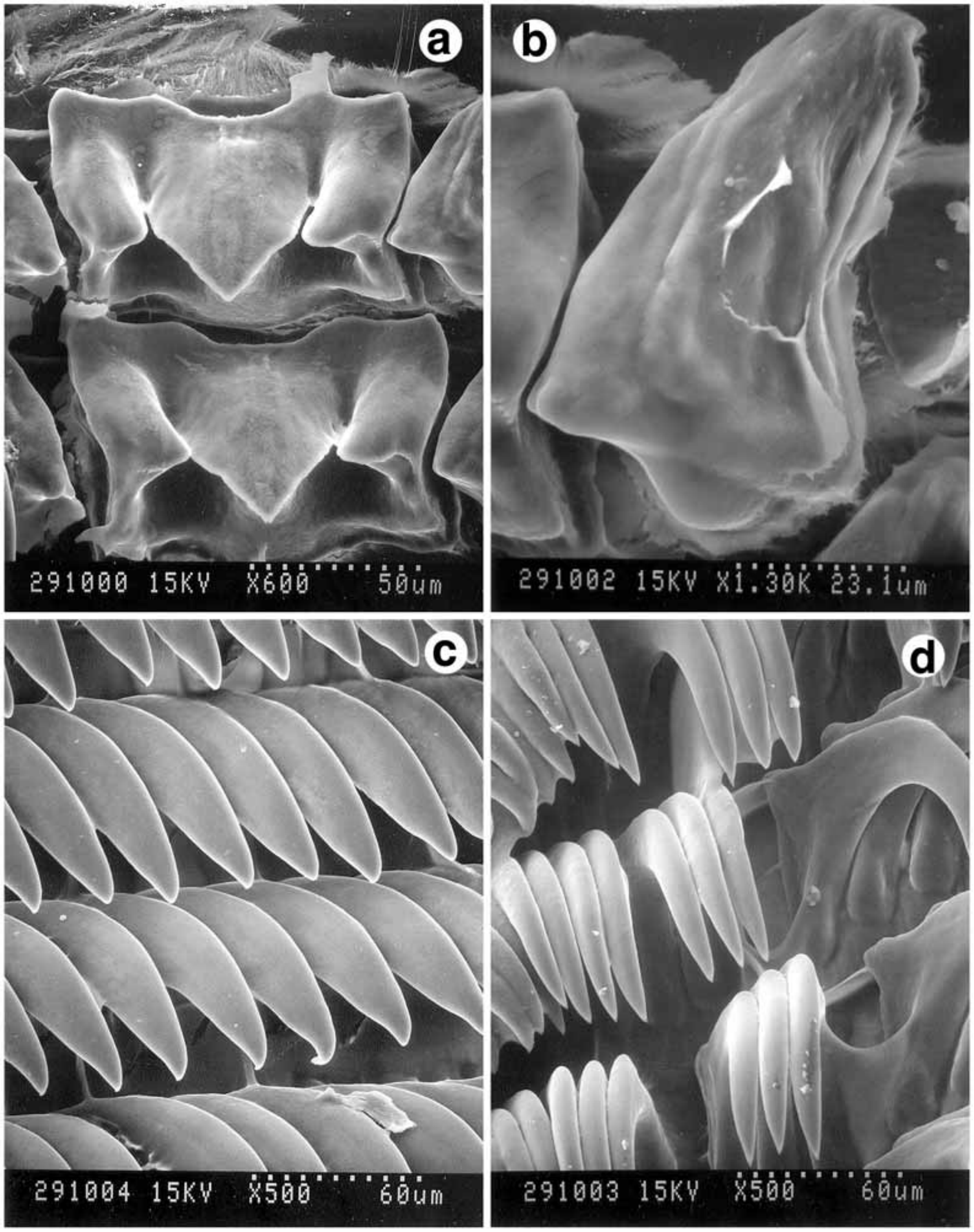

FIGURE 6. SEM's of radula of CASIZ 115750. (a) Rachidian teeth and first laterals near new end of radula. (b) Detail of first lateral and first inner lateral. (c) Inner lateral teeth of portion of half-row. (d) Outer lateral teeth of portion of half-row.

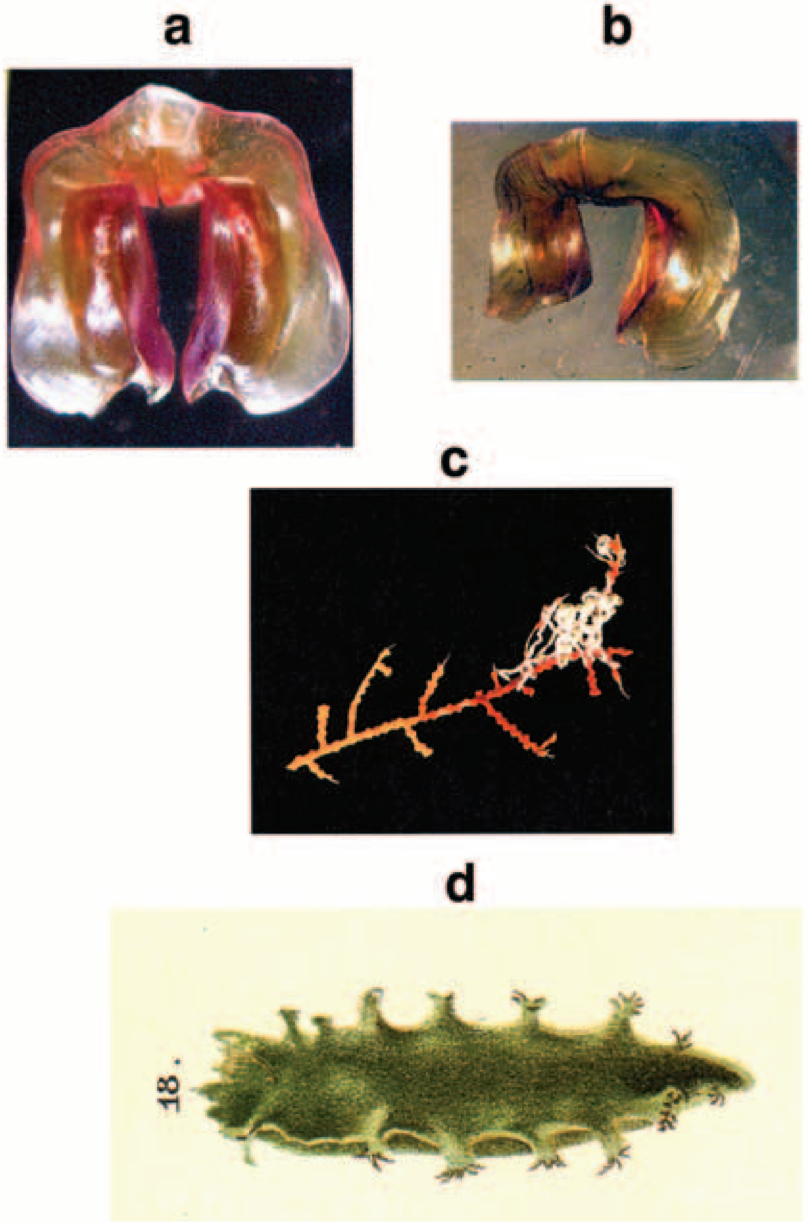

FIGURE 7. (a) Digital photo of jaws of paratype CASIZ 105302. (b) Digital photo of jaws of paratype CASIZ 115750. (c) Digital photo of coral sample and egg mass, CASIZ 115738. (d) Scanned image of plate of *Tritonia olivacea* Bergh, 1905.

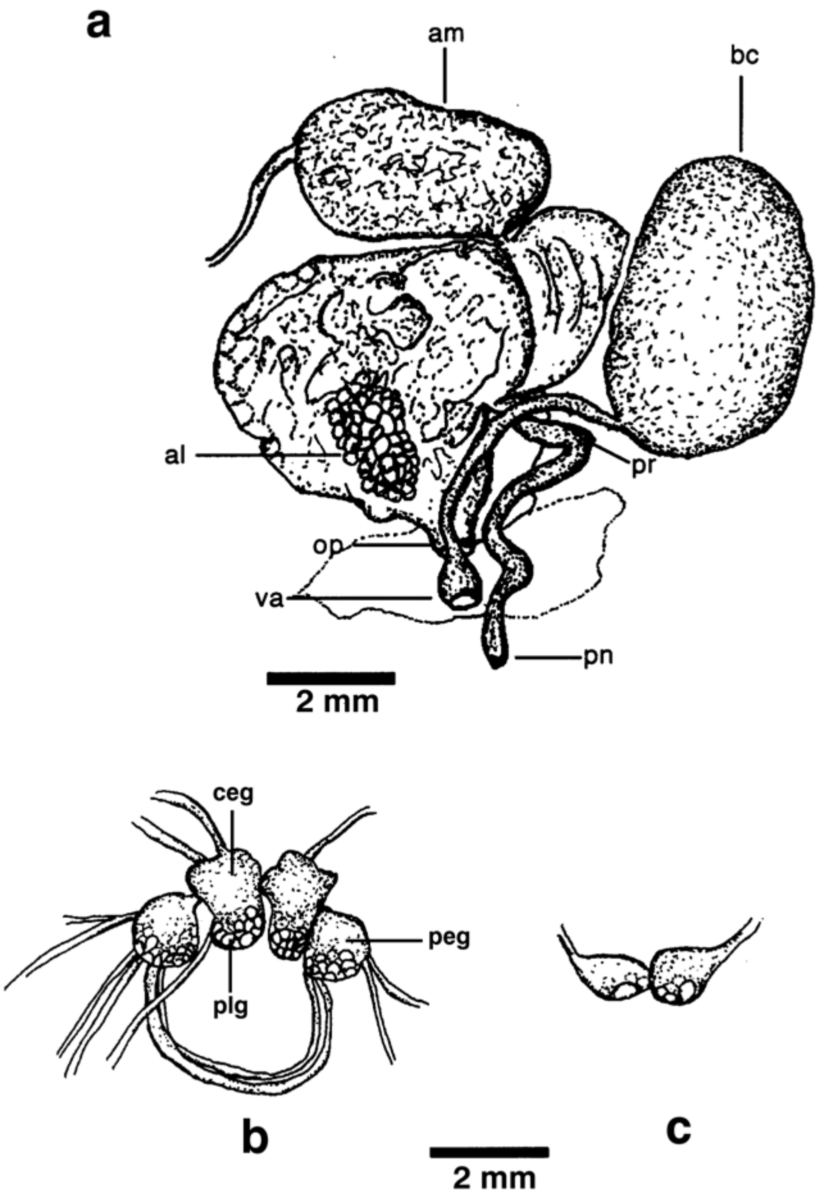

FIGURE 8. Details of internal anatomy of holotype CASIZ 105302. (a) Reproductive system. al = albumen gland; am = ampulla; bc = bursa copulatrix; od = oviduct; pn = penis; pr = prostatic portion of vas deferens; va = vagina. (b) Central nervous system. ceg = cerebral ganglia; peg = pedal ganglia; plg = pleural ganglia. (c) Buccal ganglia.

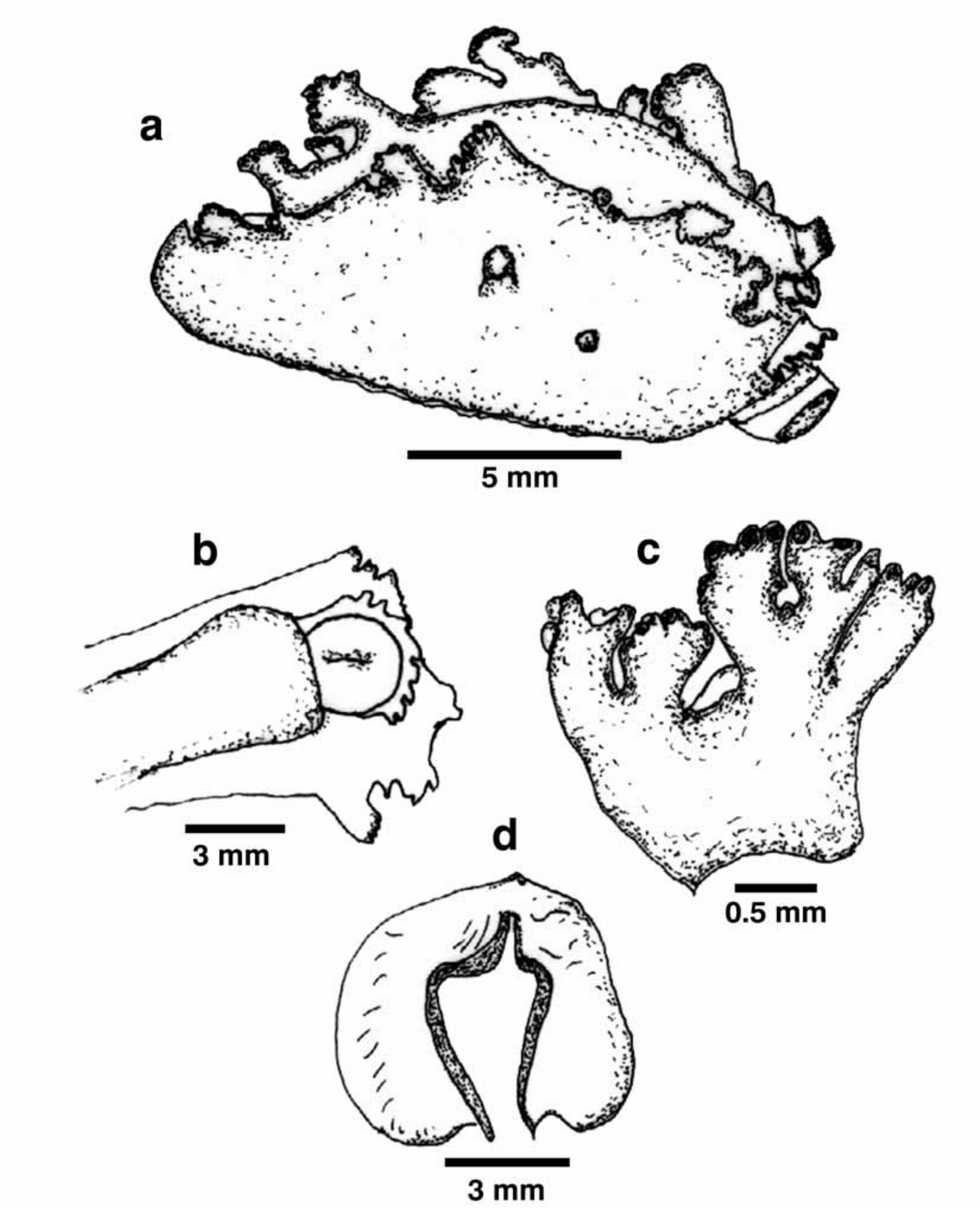

FIGURE 9. Drawings made from paratype of *Tritonia olivacea* Bergh, 1905. (a) Body of preserved specimen, right side. (b) Anterior ventral view. (c) Isolated branchial plume. (d) Jaw, possibly from holotype.

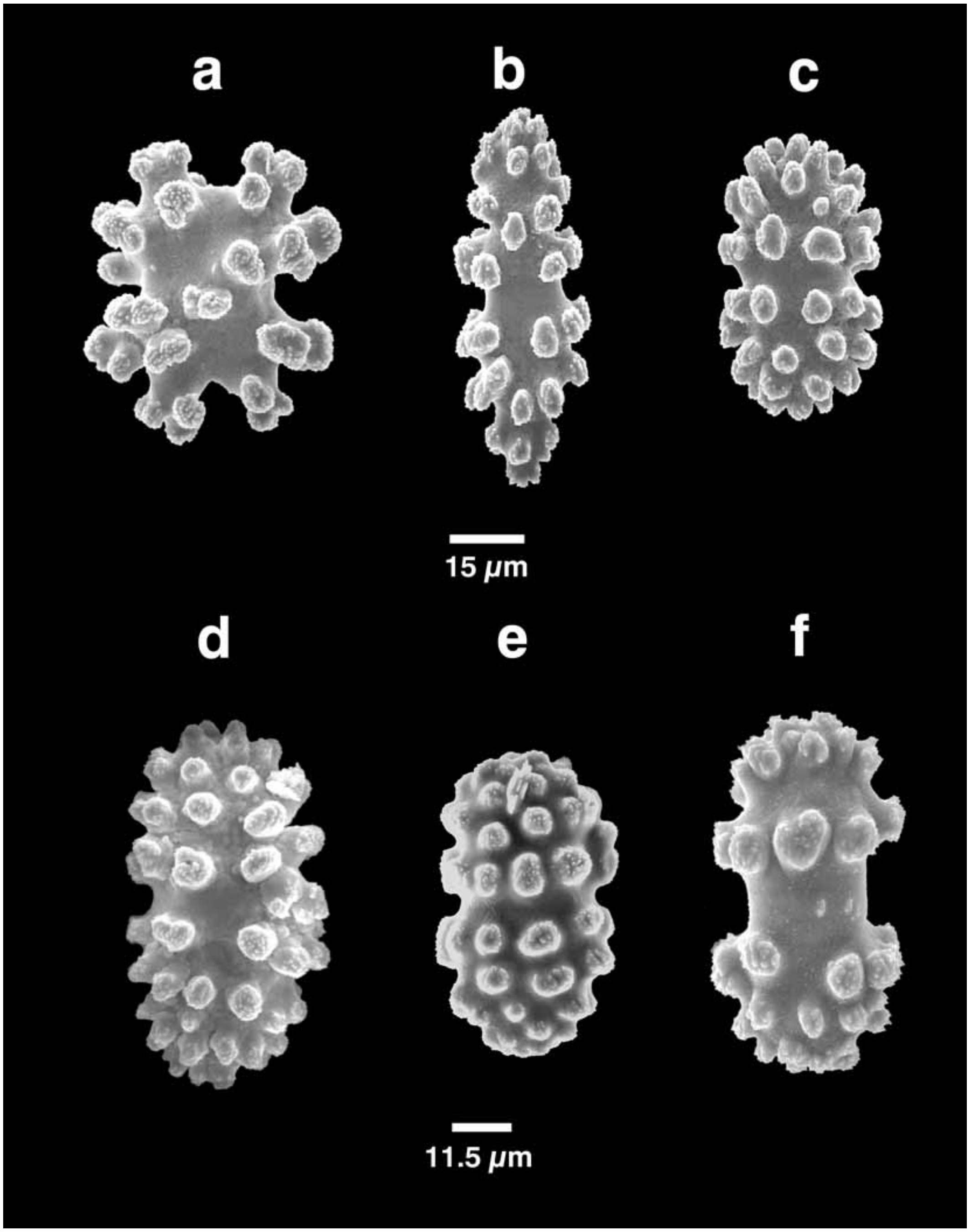

FIGURE 10. (a–f) SEM's of sclerites taken from the digestive tract of nudibranch CASIZ 105302.

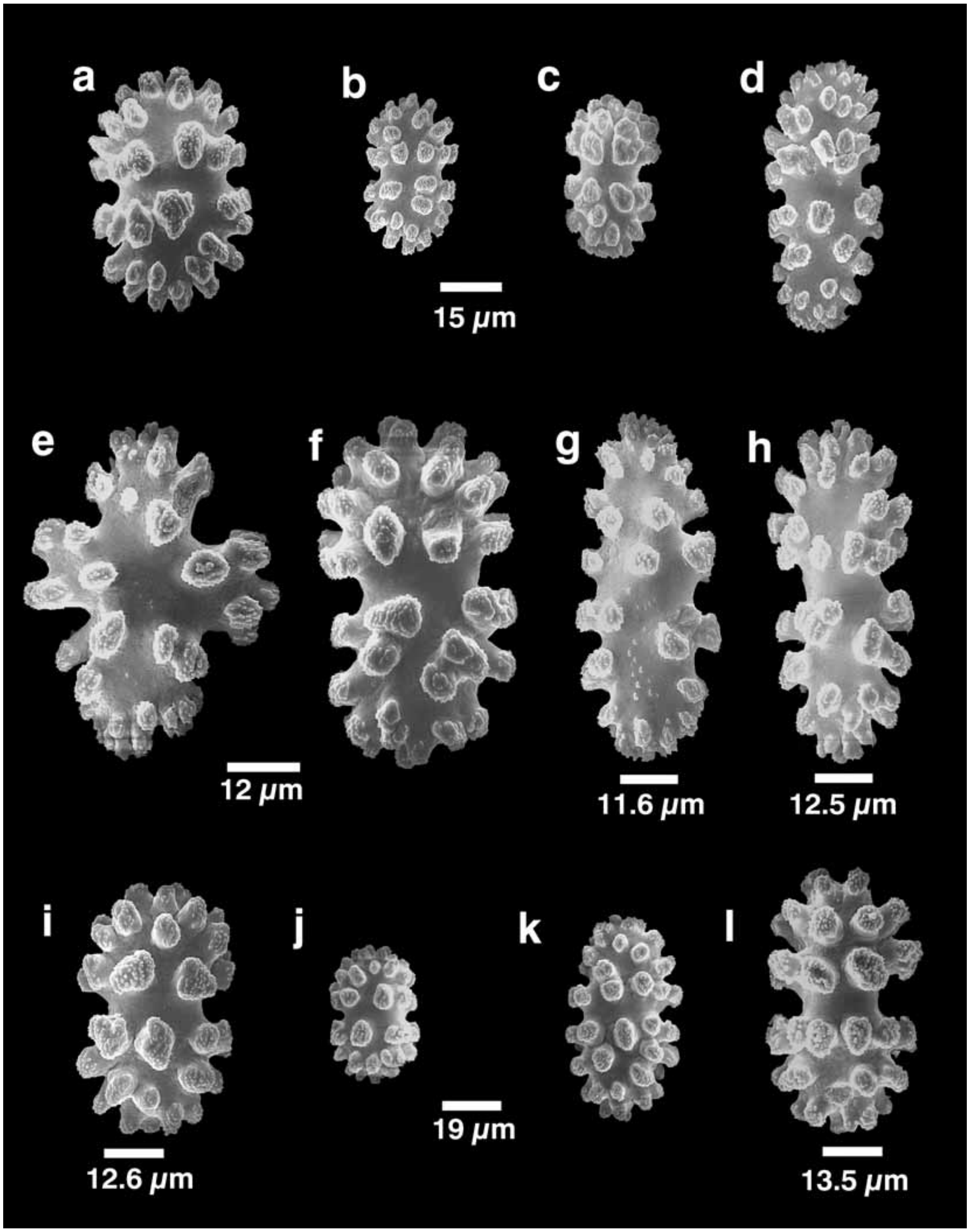

FIGURE 11. (a–l) SEM's of sclerites from coral sample CASIZ 105303 collected along with nudibranch CASIZ 105302.

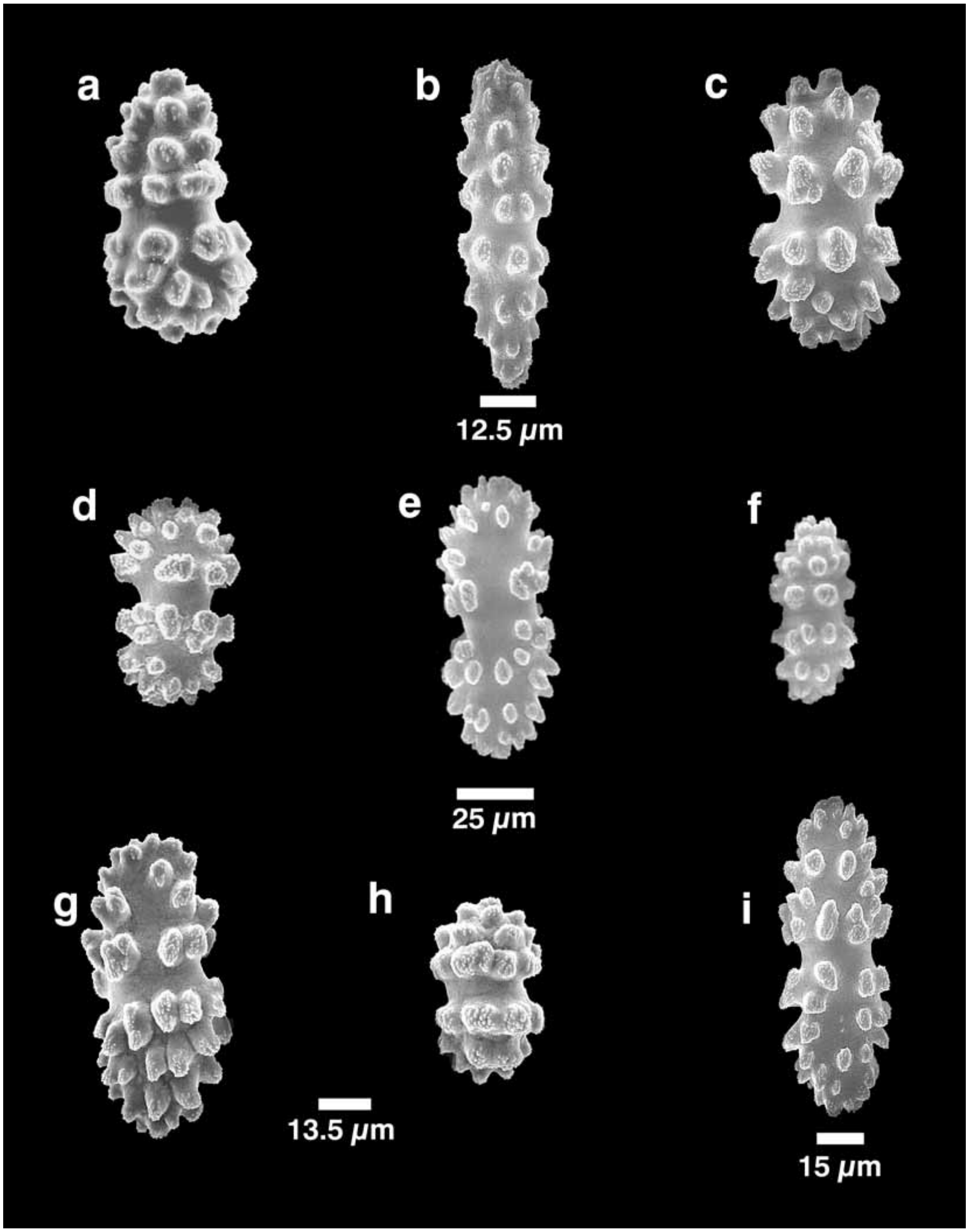

FIGURE 12. (a–i) SEM's of sclerites from coral sample CASIZ 105330, prey of nudibranch CASIZ 105329.

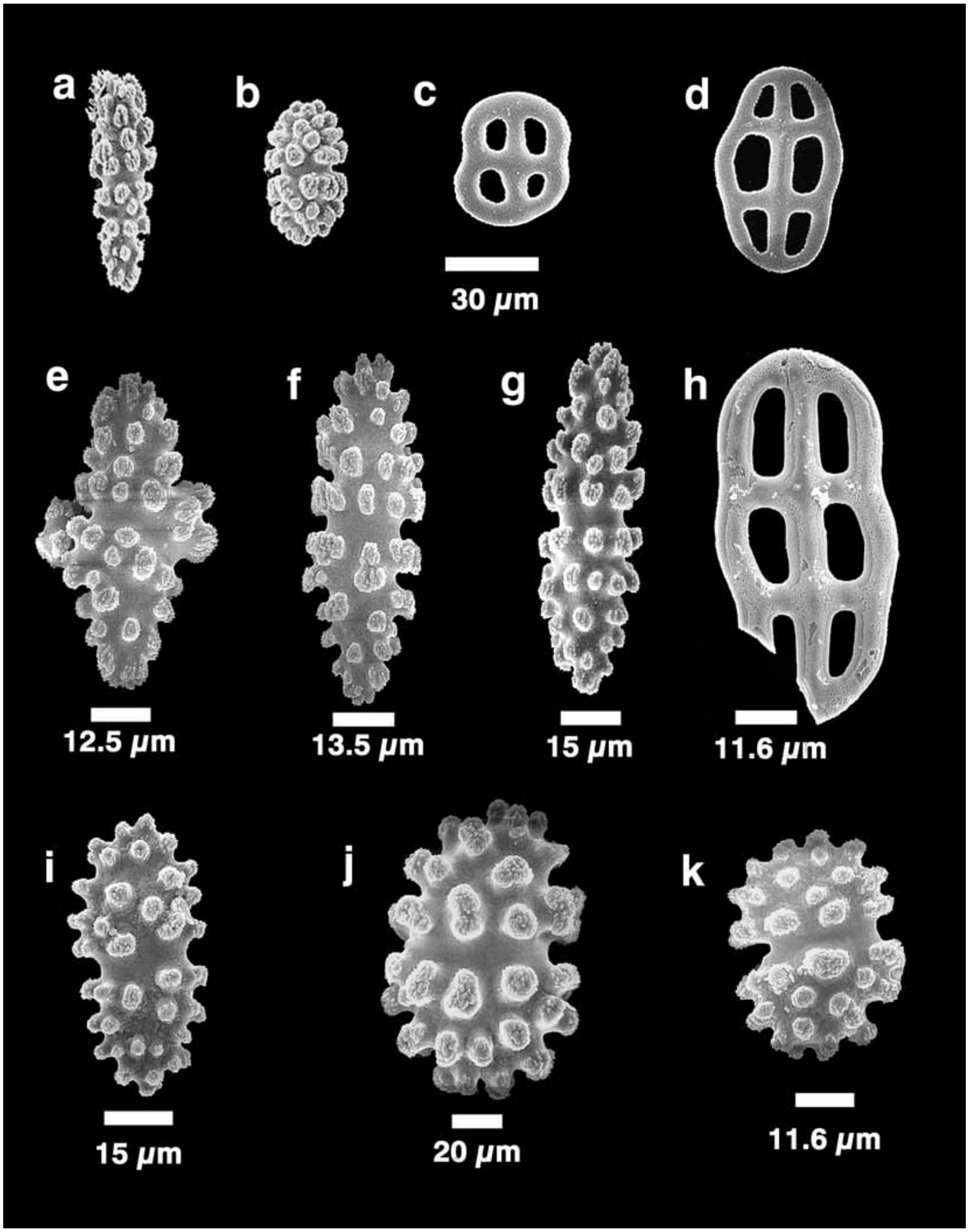

FIGURE 13. (a–f) SEM's of sclerites from coral sample collected with nudibranch CASIZ 115738. (g-k) Sclerites taken from material collected at anus of nudibranch

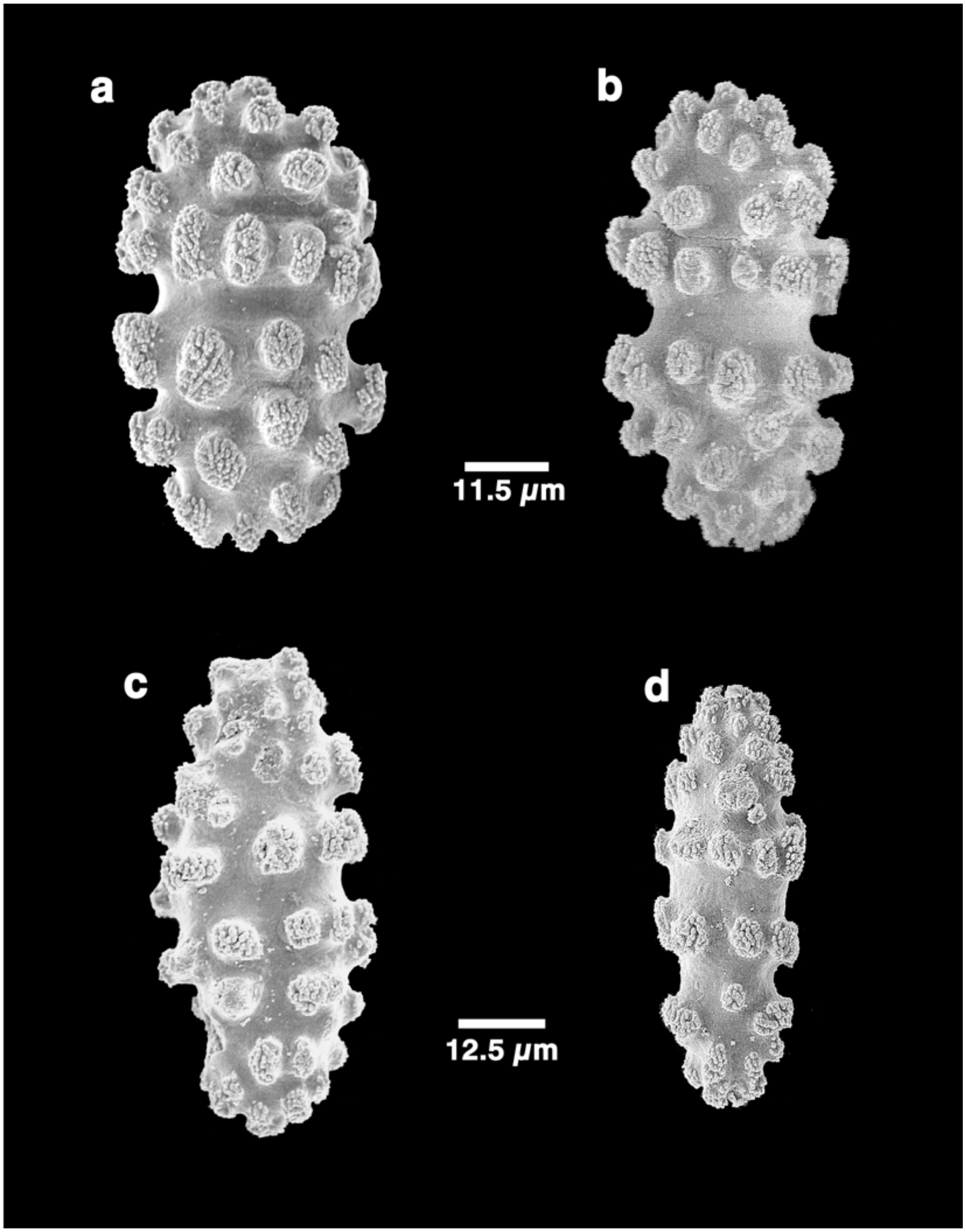

FIGURE 14. (a–d) SEM's of sclerites from coral sample CASIZ 105328.

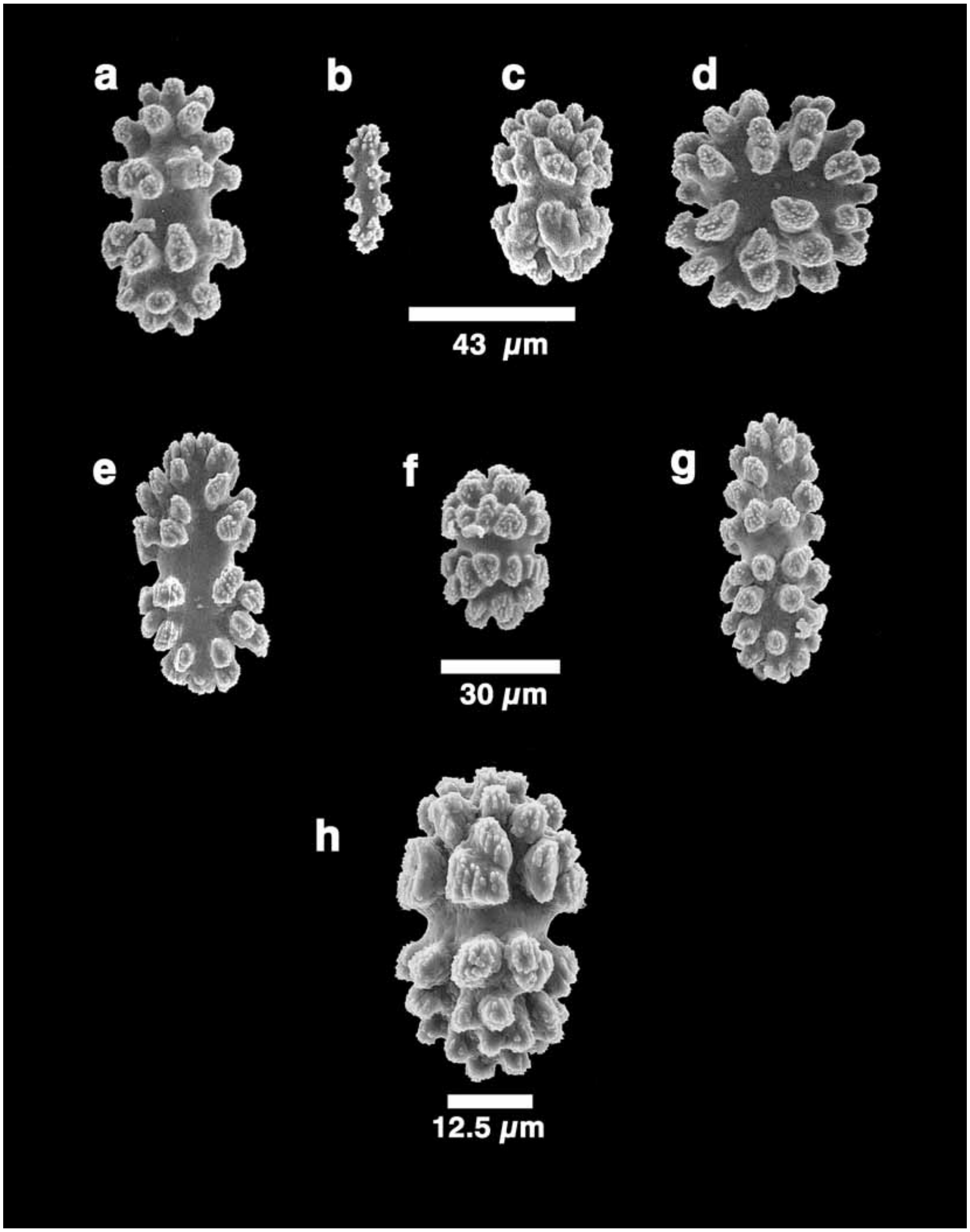

FIGURE 15. (a–h) SEM's of sclerites from coral sample CASIZ 105301, collected along with nudibranch CASIZ 105300.

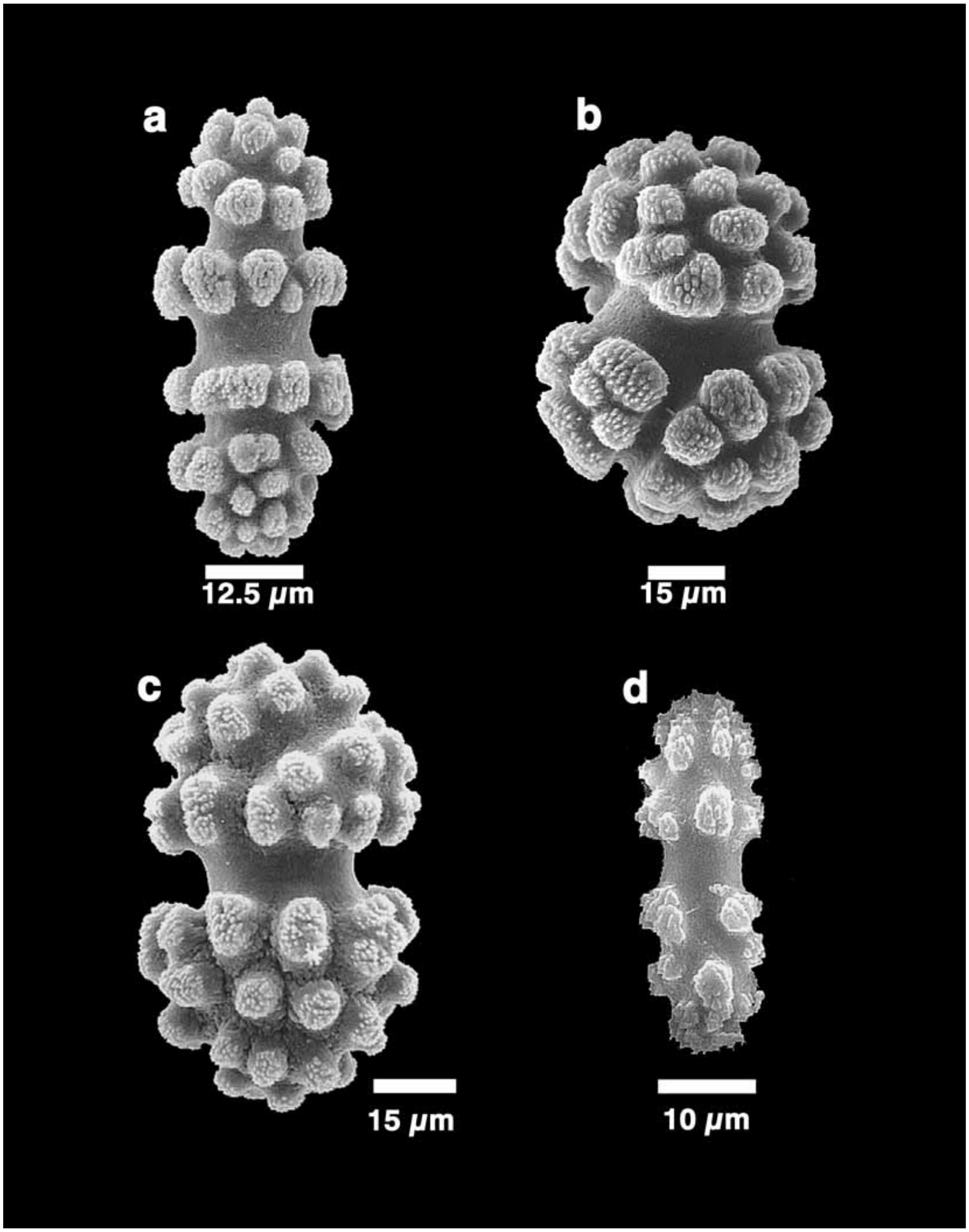

FIGURE 16. (a–d) SEM's of sclerites from stomach contents of CASIZ 115750.