

# The First Record of *Polycerella* Verrill, 1881, from the Pacific, with the Description of a New Species

by

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*Abstract.* A new species of *Polycerella*, *P. glandulosa* is described from the Pacific coast of California and the Gulf of California. It differs from the Atlantic *P. emertoni*, the only other member of the genus, in several aspects of its external and internal morphology. *Polycerella glandulosa* is characterized by its few rhinophoral lamellae and its compoundly digitate extra-branchial appendages.

## INTRODUCTION

Specimens of an undescribed *Polycerella* were abundant along the California coast from Morro Bay to San Diego, in late 1982 and throughout 1983. Specimens have also been collected commonly at various localities within the Gulf of California. This paper describes the morphology and aspects of the biology of this species and compares them to the only other known member of the genus, *Polycerella emertoni* Verrill, 1881.

*Polycerella glandulosa* Behrens & Gosliner, sp. nov.

(Figures 1-4)

**Type material:** Holotype: California Academy of Sciences, San Francisco, CASIZ 063272, one 7 mm specimen, Punta Gringa, Bahia de los Angeles, Baja California, Mexico, 10 m depth, 1 October 1984, T. M. Gosliner. Paratypes: CASIZ 063273, four specimens, Punta Gringa, 10 m depth, 1 October, 1984, T. M. Gosliner; CASIZ 063268, 8 specimens, Los Islotes, north of La Paz, Baja California Sur, Mexico, 15-20 m depth, 22 July 1985, T. M. Gosliner.

**Etymology:** The specific name *glandulosa* is chosen to call attention to the yellow glandular structure occurring distally on the extra-branchial appendages.

**Distribution:** *Polycerella glandulosa* has been found along the Pacific coast of California from Morro Bay south to San Diego. Within the Gulf of California it has been found from the La Paz region north to Bahia de los Angeles.

**Natural history:** *Polycerella glandulosa* has generally been collected in association with the ctenostomatous bryozoan *Zoobotryon* sp. Specimens, together with egg masses, are commonly found crawling on *Zoobotryon* colonies, on floating docks, and in the shallow subtidal zone to a depth of 20 m. Specimens from Morro Bay were collected in association with another bryozoan, *Bugula* sp.

**External morphology:** The living animals reach 8 mm in length. The limaciform body is typically polycerid. It is compressed laterally and is highly arched dorsomedially, near the branchial region (Figures 1, 2A). The foot is linear and tapers posteriorly into a bluntly pointed tail. The anterior corners of the foot form a pair of triangular points (Figure 2A). The head is rounded and bears rounded lobes laterally. The distinct, semicircular frontal veil consists of 5 papillae. These papillae are simple, elongate, and cylindrical, tapering to a point apically. There are 2 extra-branchial appendages, situated posterolaterally to the branchial plume. These appendages are irregularly ramified and are slightly swollen at the most distal ramus (Figure 2B). This swelling is yellowish and glandular, and

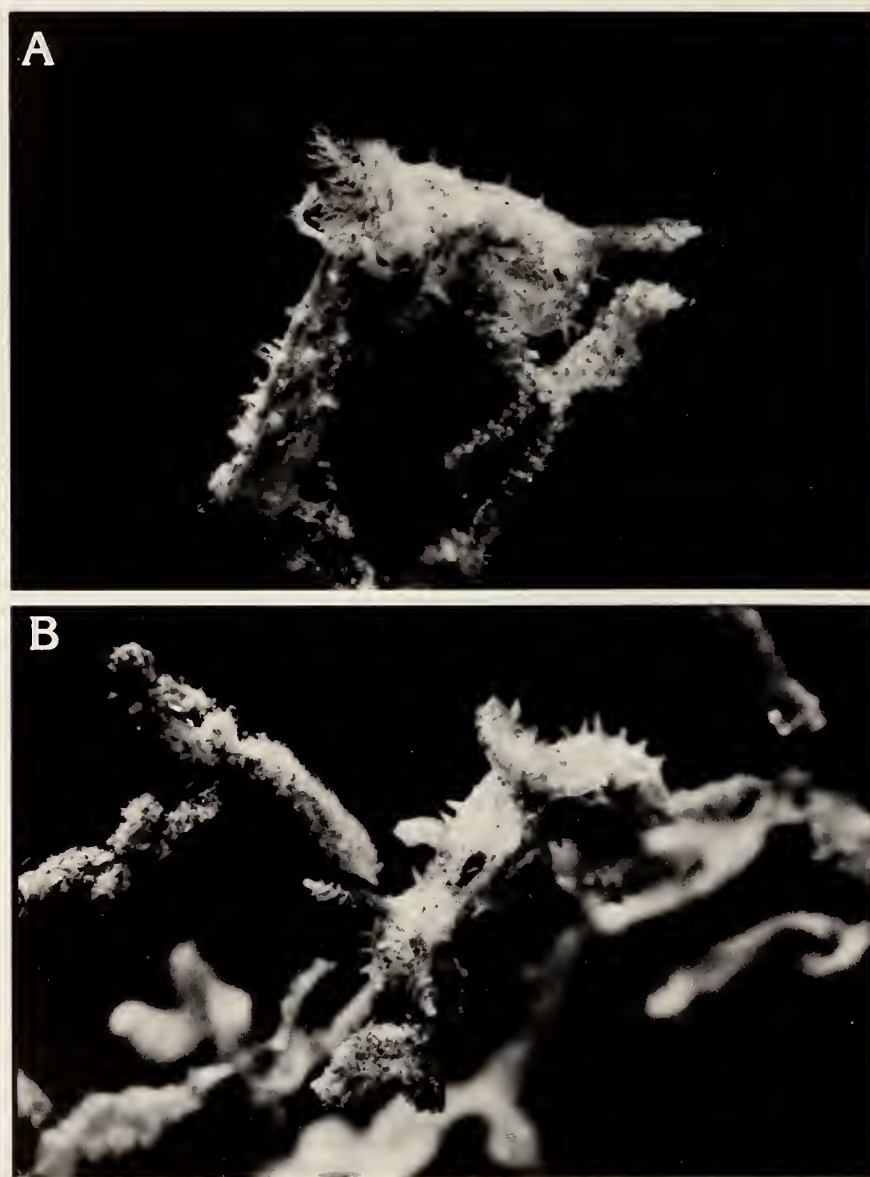


Figure 1

A and B. Living animal (8 mm in length) of *Polycerella glandulosa* sp. nov., collected from Mission Bay, San Diego, California, November 1982. Photos by Jeff Hamann.

appears granular internally. The function of this organ is unknown. The non-retractile rhinophores (Figure 2C) are perfoliate with 3 or 4 lamellae. The clavus of the rhinophores is short, less than one-third of the entire rhinophore. The shaft tapers slightly towards the clavus. The branchial plume is semicircular and consists of 6 or 7 irregularly bipinnate gills. The posterior 2 gills are smaller than the anterior ones. The notum is ornamented with numerous cylindrical papillae. The anus is situated within the branchial plume. The genital apertures are located on the right side of the body at approximately the level of the anteriormost portion of the branchial plume.

The ground color is translucent white to cream. The notum bears a series of irregular subepidermal brown streaks and blotches. The notum is covered with yellow-white and dark brown specks. The living animals appear dirty white in color and are exceedingly cryptic when on colonies of *Zoobotryon*.

**Digestive system:** The buccal mass is well developed and muscular. A pair of short, cylindrical salivary glands is present at the juncture of the narrow esophagus with the posterior portion of the buccal mass. The jaws (Figure 3A) are ovoid and brown in color. Their surface is or-

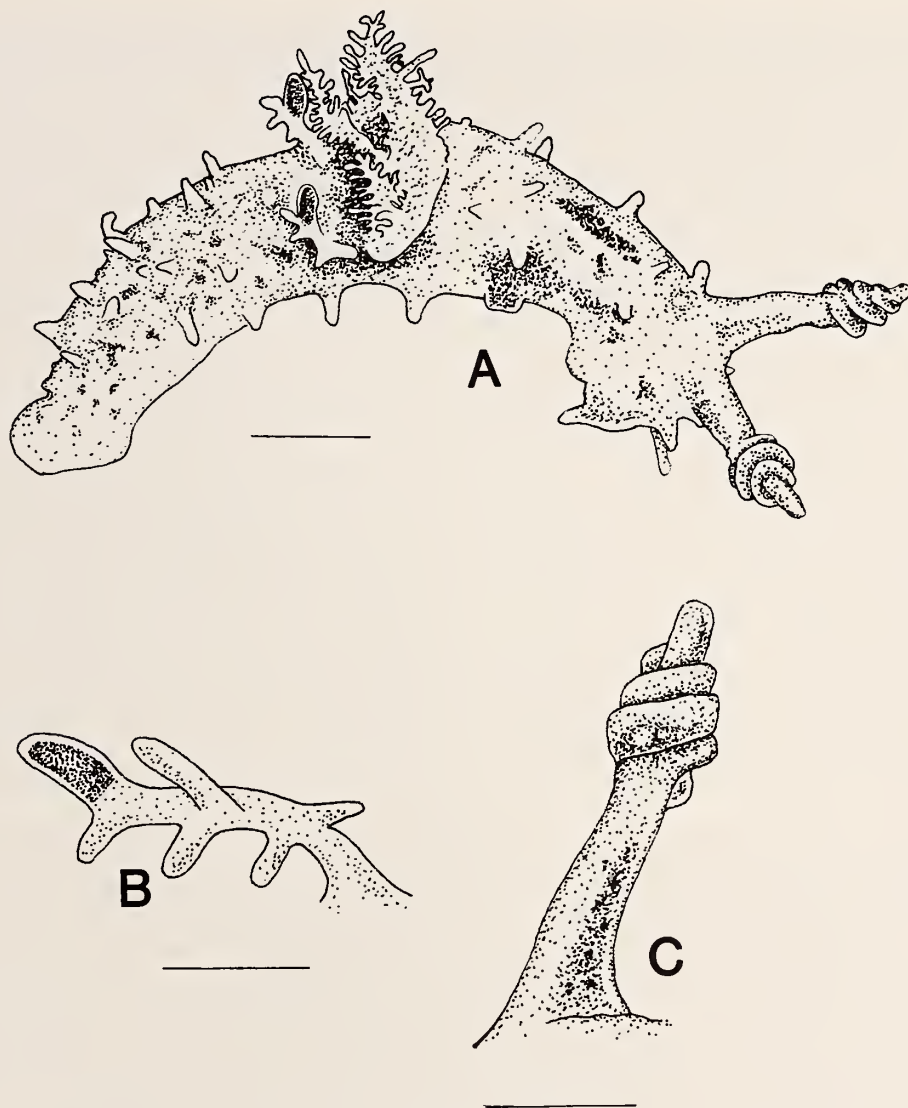


Figure 2

*Polycerella glandulosa*. A. Living animal drawn from color transparency, scale = 1.0 mm. B. Extra-branchial process, scale = 0.25 mm. C. Rhinophore, scale = 0.5 mm.

namented with flattened polygonal rodlets (Figure 3B). The radula is minute and details of its morphology are discernible only by means of scanning electron microscopy. The radular formula is  $28-40 \times 3.1-2.0 \cdot 1-2 \cdot 3$  in three specimens examined. The shape and configuration of the radular teeth varies from one end of the radula to the other. The formative portion of the radula is widest and tapers significantly towards the older portion. In the oldest portion of the radula the inner two laterals are fused to form a single elongate tooth with four denticles (Figure 4A). After approximately the 15th radular row, these two laterals become entirely separate. More posteriorly, the inner lateral teeth (Figure 4B) are roughly triangular in shape, with simple apical and basal hook-shaped denticles.

The second lateral is largest with an acutely pointed, triangular denticle near the apex. A thickened medial portion runs basally to the triangular basal denticle. In the oldest portion of the radula the third laterals are simply hook-shaped teeth. More posteriorly, they are roughly rectangular, devoid of denticles, with a thickened medial portion (Figures 4C, D). In the older portion of the radula the outer two teeth are elongate and sickle-shaped. More posteriorly, the fourth tooth has a thickened base, while the fifth tooth remains narrow and elongate.

**Reproductive system (Figure 3C):** The preampullary duct is narrow and expands into a short, saccate ampulla. More proximally the ampulla narrows into a postampul-

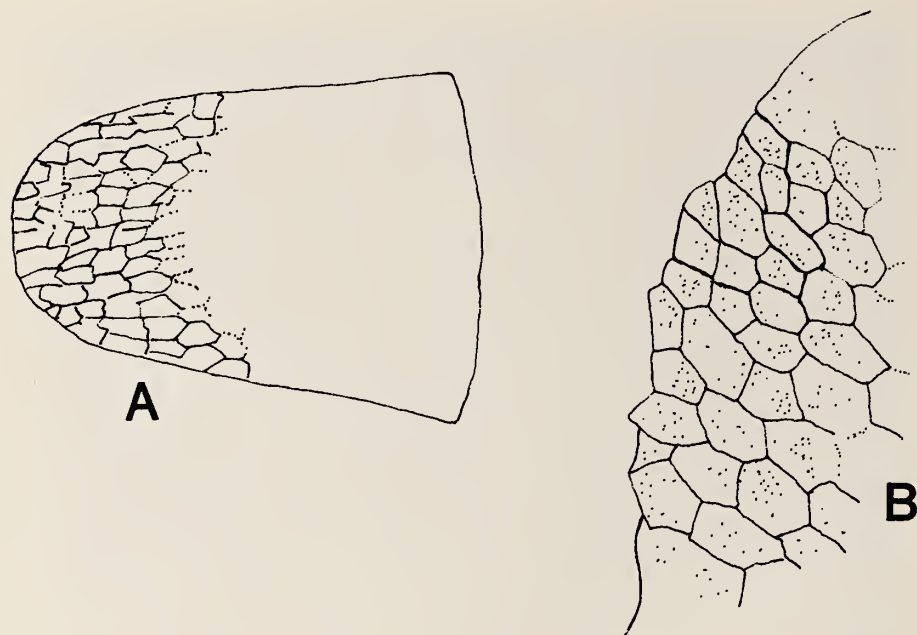


Figure 3

*Polycerella glandulosa*. A. Jaw,  $\times 200$ . B. Jaw rodlets,  $\times 400$ . C. Reproductive system, scale = 1.0 mm: al, albumen gland; am, ampulla; bc, bursa copulatrix; me, membrane gland; mu, mucous gland; n, nidamental opening; p, penis; pr, prostate; rs, receptaculum seminis; v, vagina; vd, vas deferens.

Figure 4

*Polycerella glandulosa*. Scanning electron micrographs of radula. A. Oldest portion of radula. B. Middle of radula. C and D. Newest portion of radula.



lary duct that divides into the oviduct and vas deferens. The oviduct enters the female gland mass in the vicinity of the albumen gland. The uterine duct also emerges from the female gland mass close to the oviduct. It continues as a narrow duct to the base of the pyriform receptaculum seminis, where it joins with the receptaculum duct. The receptaculum duct joins the vaginal duct prior to their common entrance into the thin-walled, spherical bursa copulatrix. The narrow vagina is elongate and expands immediately prior to its exit adjacent to the penis. The albumen gland is the smallest portion of the female gland mass. The membrane gland is slightly larger, consisting of numerous whitish folds. The membrane gland is smooth, with several distinct lobes. The female glands terminate at the nidamental gonopore ventral to the vaginal and penial apertures. The narrow vas deferens expands into the large prostate gland a short distance from its division from the ampulla. At its proximal end the prostate abruptly narrows again into an ejaculatory segment. Its proximal end contains several rows of minute, curved chitinous hooks. No distinct penial papilla is present.

#### DISCUSSION

The genus *Polycerella* Verrill, 1881, includes species with a narrow radula, consisting of more rows of teeth than *Polycera* Cuvier, 1817, and smooth, rather than perfoliate, rhinophores. In *Polycerella*, the jaws are less well developed than in *Polycera*. Four species of *Polycerella* have been described from the Atlantic coasts of North and South America and the Mediterranean. FRANZ & CLARK (1972) considered *Polycerella davenporti* Balch, 1899, to be a junior synonym of *P. emertoni* Verrill, 1881. EV. MARCUS (1976) stated that *P. conyna* Er. Marcus, 1957, and *P. recondita* Schmekel, 1965, are also junior synonyms of *P. emertoni*. This synonymy was also supported by SCHMEKEL & PORTMANN (1982). Thus, there appears to be only one species of *Polycerella* inhabiting the Atlantic and Mediterranean.

The present species differs significantly from *Polycerella emertoni* in several aspects of its external anatomy. The

rhinophores are perfoliate, with 3 or 4 lamellae, rather than smooth. The extra-branchial processes are ramified rather than simple. There are only 3 gills in *P. emertoni* and 6 or 7 in *P. glandulosa*. The papillae are longer and more numerous in *P. glandulosa* than in *P. emertoni*.

There are also some significant internal differences separating the species. The radular teeth of *Polycerella glandulosa* are thicker and more strongly developed than those of *P. emertoni*. In *P. emertoni* the third lateral teeth are elongate hooks, while in *P. glandulosa* they are short and thick. There is only a single row of inner lateral teeth in *P. emertoni*, while there are two rows present in most of the radula of *P. glandulosa*.

In view of the addition of *P. glandulosa* to *Polycerella*, the genus must be expanded to include species with smooth and perfoliate rhinophores. *Polycera* differs from *Polycerella* in having numerous (12-17) densely packed rhinophoral lamellae, a narrow radula with quadrate, rather than elongate, outer lateral teeth, and strongly developed jaws.

#### ACKNOWLEDGMENTS

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