Kyopoda lamberti gen.nov., sp.nov., an atypical stauromedusa (Scyphozoa, Cnidaria) from the eastern Pacific, representing a new family[1]

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A new stauromedusa, ***Kyopoda lamberti*** gen.nov., sp.nov., is described from British Columbia and California. Unlike all other known Stauromedusae, which have their stomach and gonads in the calyx, this small vermiform species has these structures in a sac-like swelling at the base of the stalk. Because of this characteristic it is placed in a new family, the **Kyopodiidae**. Its systematic position within the Eleutherocarpida is unknown.

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On trouvera ici la description d'une nouvelle stauroméduse, ***Kyopoda lamberti*** gen.nov., sp.nov., de Colombie-Britannique et de Californie. Contrairement à ce qui prévaut chez toutes les autres stauroméduses qui ont l'estomac et les gonades dans le calyx, chez cette petite espèce vermiforme ces organes se trouvent dans un renflement en poche à la base du pédoncule. L'espèce est donc placée dans une nouvelle famille, les **Kyopodiidae**. La position systématique de cette méduse au sein des Eleutherocarpida demeure inconnue.

[Traduit par la revue]

Introduction

The Stauromedusae constitute a small and rarely seen order of benthic scyphozoans which have both polypoid and medusoid characters (Hyman 1940; Gwilliam 1956). They occur in shallow temperate waters where wave surge or currents are evident. They are octoradiate animals with a vase- or goblet-shaped calyx, or body, which ranges from 1 to 5 cm in height. The calyx contains the stomach (coelenteron) and gonads. Numerous short, capitate, secondary tentacles occur around the calyx margin in eight adradial groups and between each group is a single primary tentacle (anchor). A stalk or peduncle of variable length attaches the medusa to the substratum with a pedal disc.

Stauromedusae commonly fix themselves to algae, sea grass, or rocks and are generally cryptically colored. Prey consist mostly of small epibenthic crustaceans (Larson 1978, 1980).

Radiation in this group has taken place mostly by changes in the shape of the calyx, length of the stalk, and number and arrangement of gastrovascular canals (Berrill 1963). This diversity may reflect adaptations to different habitats and (or) prey taxa and sizes.

The medusae that are described here for the first time represent a radical departure from the typical stauromedusan body plan because the stomach and gonads are located in the stalk rather than in the calyx.

An account of the comparative morphology of Stauromedusae is presented by Berrill (1963).

Material and methods

The medusae were collected and photographed in situ using SCUBA. The material was fixed in formalin and transferred to 70% ethanol. Anatomical studies were made with the aid of a dissecting microscope. Thick sections were cut by hand and studied using a compound microscope. Staining was not required in the well-fixed material. Figures were drawn with the aid of a camera lucida.

[1]Contribution No. 635 of the Harbor Branch Oceanographic Institution.

Results

SUBORDER Eleutherocarpida

Diagnosis

Stauromedusae with four simple perradial gastric cavities and without a claustrum or mesogonial pocket.

Discussion

Gwilliam (1956) revised the Stauromedusae and raised the level of families (Eleutherocarpidae and Cleistocarpidae) to suborders (Eleutherocarpida and Cleistocarpida) to emphasize distinctions that he thought were evident at the suborder level. His reclassification scheme is followed here. Berrill (1963) discusses the differences in the functional morphology of the two orders. Naumov (1961) states that one of the diagnostic characters separating the two suborders is the absence of the glandular abaxial cushions on the secondary tentacles in the Eleutherocarpida (=Haliclystidae). However, these cushions occur on both *Kyopoda lamberti* gen.nov., sp.nov. and *Lucernariopsis vanhoeffeni* (Brown, 1910) (unpublished observation), which belong to the Eleutherocarpida.

Kyopodiidae fam.nov.

Diagnosis

Eleutherocarpida in which the basal portion of the stalk is enlarged and contains the stomach and gonads, which are absent from the calyx.

Kyopoda gen.nov.

Diagnosis

As for the family since it is monotypic at present.

TYPE SPECIES: *Kyopoda lamberti* sp.nov.

ETYMOLOGY: *Kyopoda* is from the Greek *kyo* for "swell," and *podos* for "foot," referring to the swollen basal gastric sac.

Discussion

This new medusa, although clearly belonging to the Eleutherocarpida because it has only four simple gastric cavities, is distinct from all other described taxa because the

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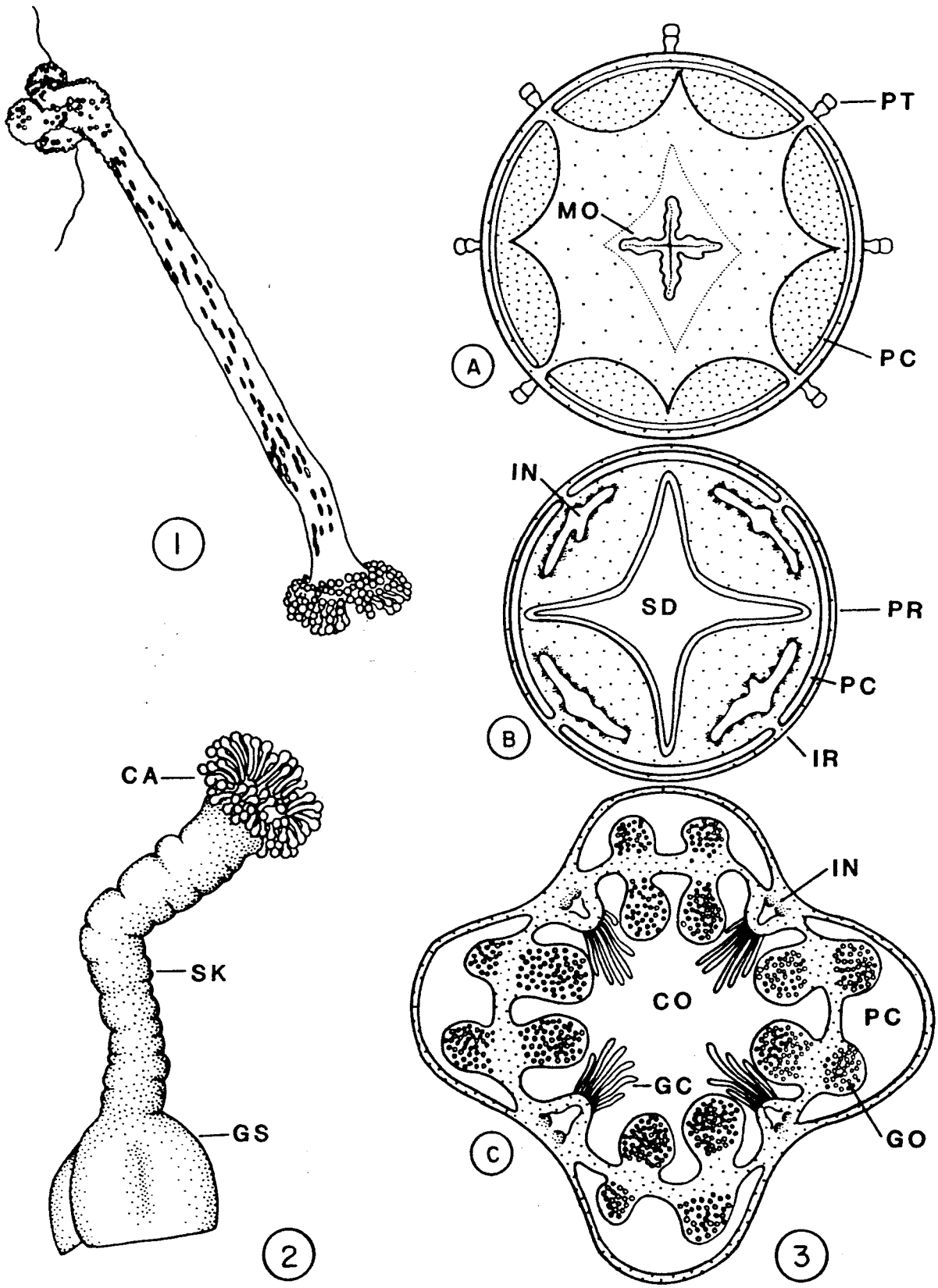

FIG. 1. Drawing made from an in situ photograph of *Kyopoda lamberti* taken at about 10 m depth, Rivers Inlet, Queen Charlotte Sound, British Columbia (photographed by B. Cooke, Royal British Columbia Museum). FIG. 2. Side view of preserved holotype specimen (8 mm total length). CA, calyx; GS, gastric sac; SK, stalk. FIG. 3. Schematic diagrams of cross sections of *Kyopoda lamberti*: (A) through midportion of calyx; (B) through midportion of stalk; (C) through midportion of gastric sac. CO, coelenteron; GC, gastric cirri; GO, gonad; IN, infundibulum with associated longitudinal muscles; IR, interradius, MO, mouth; PC, perradial gastric cavity; PR, perradius; PT, primary tentacle (anchor); SD, stomodeum.

stomach and gonads are located near the base of the peduncle rather than in the calyx. The phylogenetic position of this new family within the Eleutherocarpida is unclear because it is radically different from other known taxa.

Kyopoda lamberta sp.nov.
(Figs. 1–3)

Description

Body mostly vermiform, in life to about 2 cm or more in total length (Fig. 1). The mouth is quadrate with frilled lips. The calyx is short and flared; no arm lobes are evident (Fig. 2). Eight adradial groups of secondary, capitate tentacles occur in several ranks just proximal to the margin of the calyx. There are about 25 tentacles per group. The outer, abaxial tentacles have abaxial glandular pads about midway along their length. The eight primary tentacles (four perradial and four interradial), or anchors, are located on the margin between the groups of secondary tentacles. Their morphology is similar to that of abaxial secondary tentacles but they are somewhat shorter and thicker. The calyx contains the stomodeum and four perradial gastric cavities which extend through the stalk and into the gastric sac (Fig. 3). The coronal muscle is weakly developed and continuous.

The stalk is highly contractile (compare relative proportions in Figs. 1 and 2), not clearly separated from the calyx, and circular in cross section. It contains four perradial gastric cavities, the stomodeum, and four broad, interradial infundibula with associated longitudinal muscle bundles which extend into the gastric sac (Fig. 3).

The basal portion of the stalk is swollen into a cruciform gastric sac where the stomach and gonads are located (Fig. 3). The gastric cirri occur in four longitudinal, interradial groups. The narrow infundibula and longitudinal muscles are located in the interradii just abaxial to the cirri. Most of the gastric sac consists of four swollen, pouch-like perradial gastric cavities containing the paired adradial gonads. When mature, the numerous enlarged gonadal follicles, which occur in parallel rows, extend adaxially into the stomach cavity and abaxially into the dilated perradial cavities.

The medusa attaches to the substratum with a large basal disc.

The general coloration of the animal is purple in life. Small white spots occur on the calyx and stalk but are most numerous on the surface of the gastric sac. These are evident on the fixed material.

Cnidome

Microbasic euryteles, 8 × 14 μm in scattered patches associated with white spots on body surface, 7 × 10 μm in gastric cirri.

ETYMOLOGY: This species is named in honor of the collector, Philip Lambert of the Royal British Columbia Museum, who has contributed much to our knowledge of the marine invertebrate fauna of British Columbia.

HOLOTYPE: Specimen 8 mm in total length, Royal British Columbia Museum (RBCPM) (Victoria) No. 976-1031-20. Rivers Inlet, Queen Charlotte Sound, British Columbia, 51°22.3'N, 127°46.4'W, 8–10 m depth, 23 March 1976, P. Lambert collector.

PARATYPES: Three specimens. RBCPM No. 976-1031-21. Two specimens 8 mm, Rivers Inlet, Queen Charlotte Sound, British Columbia, 51°22.3'N, 127°46.4'W, 8–10 m depth, 23 March 1976, P. Lambert collector. One specimen, 6 mm, California Academy of Science (San Francisco) No. 065182. San Onofre, California, 33°22'N, 116°47'W, 14 m depth, July 1985, T. Herrlinger collector.

DISTRIBUTION: Queen Charlotte Islands, British Columbia, and southern California. It is possible that the range of *Kyopoda lamberti* is more or less continuous between British Columbia and southern California. However, because of its small size, cryptic coloration, and subtidal habitat, it probably has been overlooked.

Natural history

At both areas where it was collected, *Kyopoda lamberti* was seen attached to cobbles at subtidal depths were there was wave surge. Color photographs of the Queen Charlotte Sound specimens show encrusting coralline algae on the same cobble with the medusa. The purplish coloration of *K. lamberti* probably makes the stauromedusa inconspicuous among the patches of reddish coralline algae.

The morphology of *Kyopoda lamberti* suggests that it has adapted to living in areas with strong wave surge. With its stomach and gonads near the substratum and its calyx thereby reduced, the animal would experience less drag, reducing the probability of its being dislodged. The glandular pads located on the anchors and on the abaxial tentacles may serve to temporarily reanchor the medusa if it becomes detached.

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