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A new stalked species of *Polycarpa* (Tunicata: Ascidiacea) from deeper waters of the tropical Western Pacific and in situ observations on sympatric species

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Abstract

A new species of a stalked ascidian (genus *Polycarpa*, family Styelidae) is described from living and preserved material. Living specimens of the new and some sympatric species were observed and photographed *in situ* and specimens of the former were collected by the manned submersible "JAGO" at depths between 200 and 277 m off Sangihé Island between Sulawesi (Indonesia) and the Philippines. Specimens display a number of adaptations known previously from a range of ascidian taxa recorded from deeper waters, including a stalk from the anterior end of the body, the loss of ciliated pharyngeal perforations and wide atrial apertures exposing extensive areas of the branchial sac.

Key words: Indonesia, deep water, *Pterygascidia, Bathyoncus, Culeolus*, symbionts, commensals

Introduction

The genus *Polycarpa* comprises about 120 species of solitary stolidobranch ascidians of the family Styelidae. The genus is characterized by its simple (not branched) branchial tentacles surrounding the entrance to the pharynx, four folds on each side of the branchial sac, a simple, plain-edged dorsal lamina and numerous small hermaphrodite gonads embedded in or attached to the body wall, each with separate short ducts opening into the peribranchial cavity (see Kott 1985). Species in the genus display a variety of body shapes that appear to be adaptations to different environmental conditions.

Common variations found in deep water species (including the present one) can suggest some aspects of the habitats to which these organisms are adapted. One such adaptation, often is found in species occurring at a range of depths from continental shelf and slope locations (including the present ones) to abyssal depths, involves the presence of a stalk. A stalk supports the animal and raises it above the substrate and also appears to be an adaptation to accommodate unidirectional as well as changing currents, swaying with the current flow (the base of the stalk anchored firmly to the substrate). Such stalked species with the stalk arising from the anterior end of the body where the incurrent aperture faces the oncoming current have the excurrent aperture near the top of the head (or, as in the present species, along its dorsal surface) facing in the opposite direction so that the excurrent water is entrained away from the individual (see Kott 1989 and below).

The genus *Polycarpa* is distributed worldwide, with many species found in tropical and temperate waters. Numerous species are reported from shallow waters, although others are also present in depths below 100 m and much deeper. Species that live below SCUBA diving depth previously were known only from specimens collected by grab, dredge or trawl sampling and little information was available on their lifestyle. The use of submersibles and ROVs offers the opportunity to combine *in situ* observations of deep-living animals and a

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