

Leptogorgia christiae (Octocorallia: Gorgoniidae) a new shallow water gorgonian from Pacific Panama

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Leptogorgia christiae is a rarely collected new species found at 15–30 m depth at Roca Hacha, a rocky outcrop near Coiba Island characterized by its high diversity of octocorals. The branching pattern and combination of asymmetric blunt spindles, abundance of capstans, and a low occurrence of acute spindles are distinct characteristics of the new taxon. The new species is described, illustrated and compared to the other species of the genus reported from Pacific Panama; thus increasing the total of *Leptogorgia* species to 17, which encompasses over 70% of the shallow water species for the eastern Pacific.

Keywords: *Leptogorgia christiae*, new species, Coiba Island, eastern Pacific, octocorals

Submitted 18 August 2007; accepted 17 December 2007

INTRODUCTION

Leptogorgia Milne-Edwards & Haime, 1857 (Gorgoniidae) is a widespread genus, and one of the most abundant throughout most of the eastern Pacific. Twenty-one species of the genus from shallow waters (>50 m) have been recognized as valid (Breedy & Guzman, 2007) and 16 of them are reported for Panama. Nine of these species occur in the Gulf of Chiriquí where three are abundant and widely distributed, i.e. *Leptogorgia alba* (Duchassaing & Michelotti, 1864), *L. cofrini* Breedy & Guzman, 2005, and *L. rigida* Verrill, 1864. The occurrence of the other seven species of *Leptogorgia* reported for Panama were not confirmed by our recent explorations of the Pearl Islands (Gulf of Panama) and the Gulf of Chiriquí; they are known only from type material. Gorgonians in general, but especially species of *Pacifigorgia* Bayer, 1951 and *Leptogorgia*, represent the main faunal component in several shoals around Coiba Island (Guzman *et al.*, 2004; Guzman & Breedy, 2008).

Distinction among species of *Leptogorgia*, as in most gorgoniids, is based on morphological criteria, colony growth form, colour, and sclerites (Grasshoff, 1992; Breedy & Guzman, 2007). The growth forms of the eastern Pacific species show a large range of variation, including dichotomous, pinnate, and bushy; branching in one plane or several planes, fragile or stout (Breedy & Guzman, 2007). Several groups of species can be determined just for the growth form, but the combination of the growth form, coloration, and polyp sculpture and arrangement, which is evident in living and preserved specimens, is much more significant than the growth form alone. External differences among species of *Leptogorgia* lead us to divide the 21 valid species

into three species groups (based on Breedy & Guzman, 2007). The ‘*pumila*-group’, consisting of nine species, have prominent polyp-mounds, pinnate branching and coloured colonies; the ‘*alba*-group’ consists of five species, with flat or slightly raised polyp-mounds, pinnate or dichotomous branching and white colonies; and the ‘*rigida*-group’ consists of the remaining seven species, with flat polyp-mounds, branching variable and coloured or bicoloured colonies. The new species belongs to the *pumila*-group.

Herein, we describe *Leptogorgia christiae* sp. nov., which is presently known at the type locality Roca Hacha, south-west Coiba Island, as well as its relationship with the other species in the genus reported for Panama.

MATERIALS AND METHODS

The holotype was collected by SCUBA diving, down to 30 m in depth at Roca Hacha, Gulf of Chiriquí. It was air-dried. Sclerites were prepared for light and scanning electron microscopy (SEM) following the standard techniques for structural analysis (Bayer, 1961; Breedy & Guzman, 2002). The holotype is deposited in the Museo de Zoología, Universidad de Costa Rica (UCR), Costa Rica, and a fragment is kept at the Smithsonian Tropical Research Institute (STRI), Panama. The ‘species-group’ concept used in this study was adopted from Grasshoff (1988, 1992), but without geographical considerations. Consequently, ‘species-group’ here refers to a number of species of octocorals that share similar external characteristics.

SYSTEMATICS

Class ANTHOZOA Ehrenberg, 1834
Subclass OCTOCORALLIA Haeckel, 1866
Order ALCYONACEA Lamouroux, 1816
Family GORGONIIDAE Lamouroux, 1812
Genus *Leptogorgia* Milne-Edwards & Haime, 1857

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Leptogorgia christiae sp. nov.
(Figures 1–2)

Type material

Holotype: Colony dry (Roca Hacha, Gulf of Chiriquí, Panama; water depth: 30 m) [UCR 1733 (STRI 1006)] Collected by H.M. Guzman, 27 July 2006. Fragment dry (Roca Hacha, Gulf of Chiriquí, Panama; water depth: 30 m) [STRI 1006] Collected by H.M. Guzman, 27 July 2006.

Etymology

This species is named in honour of Mrs Christy Walton marine enthusiast and supporter of biodiversity conservation in North America and the tropics. Mrs Walton and her husband Mr John Walton have encouraged scientific research, institutional and community development, and the creation of new protected areas in sensitive marine ecosystems for many years.

Diagnosis

Stiff, flabellate, light orange colony. Growth form upright, branching pinnate, 4–6 times. Anastomosis absent. Polyps sparsely placed all around branches, fully retractile. All sclerites light orange and mostly asymmetric capstans, and blunt spindles. Few spindles have acute ends. Largest spindles reach up to 0.12 mm in length. Anthocodial rods flat, up to 0.08 mm in length.

Description

Colony erect and uniplanar, 8.2 cm in height and 6.3 cm in width, arising from a laminar holdfast partially covered by coenenchyme, but devoid of polyps (Figure 1A). Stem, 3 mm in diameter extends 1.5 cm and subdivides in two branches, 2–3 mm in diameter, which diverge and subdivide up to 6 times in the same pinnate manner producing a small, flabellate, strong fan (Figure 1A&B). Branches are flattened in cross-section; they reach up to 2 mm in diameter. Unbranched terminal twigs reach up to 5 mm in length and 1 mm in diameter; tips are blunt. Polyps are distributed all around the branches and sparsely placed. Polyp-mounds are prominent and conical, with slit-like apertures (Figure 1B). Colour of the colony, sienna when alive, and fading sienna in the dry specimen. Sclerites of the coenenchyme are all light orange. They are mostly blunt spindles and capstans (Figure 1C). Capstans reach up to 0.9 mm in length and 0.04 mm in width, they are strongly tuberculate (Figure 2). Spindles are mainly blunt at the ends with a dominance of irregular forms with one end elongated composed of 2 or 3 whorls of warts, and the other with one or two; they reach up to 0.12 mm in length, and 0.05 mm in width (Figure 2). In most of the spindles, the warts are close together and the diameter of the whorls does not exceed much the diameter of the sclerite axes. Several sclerites have a characteristic bent end. Spindles with acute ends are not abundant, they can reach up to 0.13 mm in length and 0.04 mm in width,

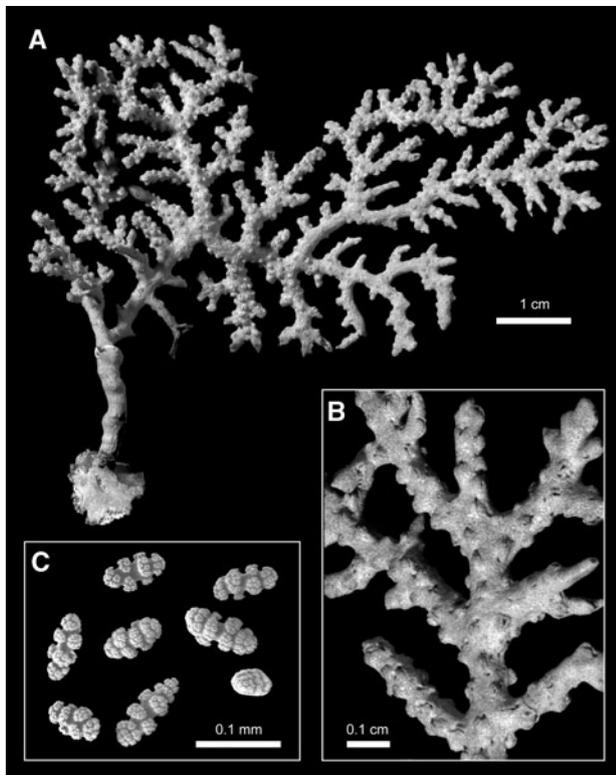


Fig 1. *Leptogorgia christiae* sp. nov. (A) holotype [UCR 1733 (STRI 1006)]; (B) detail of colony branch; (C) SEM coenenchymal sclerites.

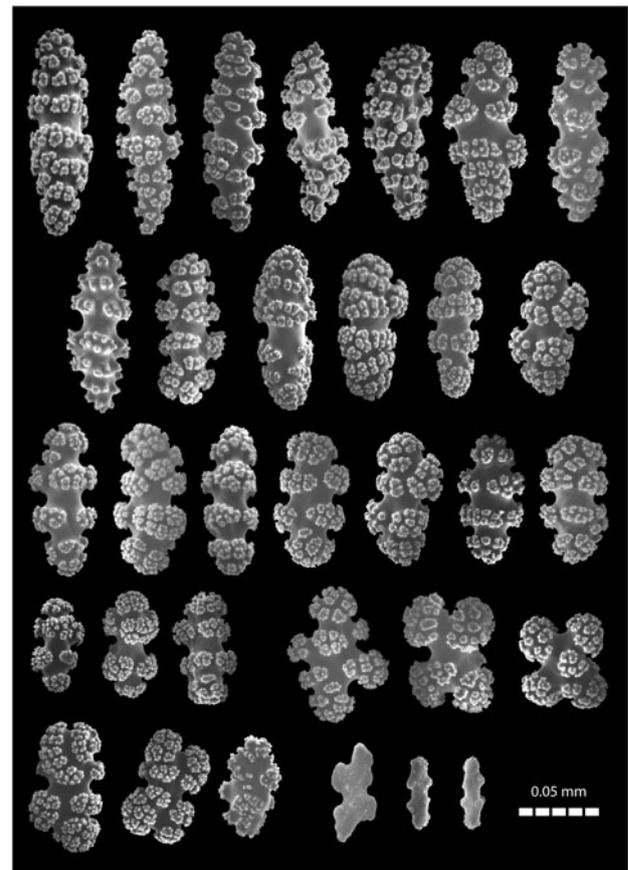


Fig 2. SEM sclerites of *Leptogorgia christiae* sp. nov., holotype [UCR 1733 (STRI 1006)].

Table 1. Comparative features for *Leptogorgia* species in the *pumila*-group.

Species of <i>Leptogorgia</i>	Colour			Growth			Sclerites			
	Colony	Sclerites	Anthocoidals	Bi-coloured sclerites	Branching tendency	No. branching	Dominant sclerite type	Spindles >0.1 mm	Bent spindles	Anthocoidal rods ≥0.1 mm
<i>L. aequatorialis</i>	do	o	lo		m	3	s		X	
<i>L. diffusa</i>	r	r, p	o		u	4	s	X		X
<i>L. floriae</i>	r	r, ly	y	X	u	3	s	X	X	X
<i>L. labiata</i>	p	p, y	y	X	m	3	c		X	
<i>L. obscura</i>	pu	p	ly		m	3	c	X	X	
<i>L. parva</i>	rpu	r, ly	o	X	m	3	c	X		
<i>L. pumila</i>	p	p, ly	o	X	m	3	s	X		
<i>L. regis</i>	p, w	p, w	w		m	4	s	X	X	
<i>L. taboguilla</i>	rp	r	o		m	4	c	X		X
<i>L. christiae</i>	s	lo	lo		u	6	c	X	X	

Colours: dark orange (do), light orange (lo), light yellow (ly), orange (o), pink (p), purple (pu), red (r), reddish purple (rpu), sienna (s), yellow (y), white (w).

Branching tendency: multiplanar (m), uniplanar (u).

Dominant type of sclerites: capstan (c), spindle (s).

and are slightly curved (Figure 2). A small number of warty crosses are also present, up to 0.07 by 0.07 mm in size (Figure 2). Anthocodial sclerites are of the same light orange hue, somewhat flattened rods, up to 0.08 mm in length, and 0.02 mm in width, with wavy borders, or with lobed-like marginal projections (Figure 2, bottom right).

Habitat

The new species is very scarce and it was found at 15–30 m depth, on exposed rocks, mixed with other octocorals species, and sponges. It has been found only at the type locality, Roca Hacha, where few scattered specimens were observed but not collected; despite this it is one of the most diverse spots around Coiba Island with about 17 species of octocorals living in a small area exposed to currents and strong swell.

Distribution

Only known from Roca Hacha, Gulf of Chiriquí, Panama (type locality).

DISCUSSION

According to the branching pattern, which is pinnate, and the prominent polyp-mounds, this species belongs in the *pumila*-group composed of *Leptogorgia pumila* (Verrill, 1868), *Leptogorgia diffusa* (Verrill, 1868), *Leptogorgia floriae* (Verrill, 1868), *Leptogorgia labiata* Verrill, 1870, *Leptogorgia parva* Bielschowsky, 1929, *Leptogorgia regis* Hickson, 1928, and *Leptogorgia taboguilla* (Hickson, 1928). All reported for Panama and *Leptogorgia aequatorialis* Bielschowsky, 1929 and *Leptogorgia obscura* Bielschowsky, 1929, only reported for Ecuador. The differences are described in Table 1. The new species is different from the others especially in the style of branching. It branches up to six times, which differs from all the others that branch 3 or 4 times. *Leptogorgia christiae* grows basically in one plane, as is the case in *L. diffusa* and *L. floriae*, but these two species have thin branches and the

colonies have a delicate appearance; *L. christiae* sp. nov. has thicker branches, and the colony is stout. In addition, the dominant type of sclerites in *L. diffusa* and *L. floriae* is the spindle while in *L. christiae* it is the capstan.

The new species is different from the others by the combination of characters of having a conspicuous branching pattern that reaches up to six subdivisions, growing basically in one plane, showing a strong aspect, and by having mainly asymmetrical sclerites, sclerites with bent ends, spindles with curved axes, and monochromatic sclerites.

Unfortunately, it is not possible to make further specimen comparison since only one specimen was available for examination. However, we have noticed that the species in the '*pumila*-group' are very consistent and show low intraspecific variation (Breedey & Guzman, 2007).

ACKNOWLEDGEMENTS

We are grateful to Phil Alderslade (Museum and Art Gallery of the Northern Territory, Darwin), Leen van Ofwegen (National Museum of Natural History Naturalis, Leiden), Gary Williams (California Academy of Sciences, San Francisco) and Stephen Cairns (NMNH) for critical review of the manuscript. We thank Carlos Guevara, and crew members from RV 'Urracá' for their invaluable help in the fieldwork. We are grateful to Enrique Freer (Centro de Investigación en Estructuras Microscópicas, UCR) for providing the SEM facilities and Percy Denyer (UCR) for making the figures. This project was partially sponsored by the Smithsonian Tropical Research Institute, The Nature Conservancy, and Conservation International. We thank the Government of Panama for providing the permits to collect and work in the country and marine protected areas.

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