CORALLOPHILA VERONGIAE (CERAMIACEAE, RHODOPHYTA), A NEW ADDITION FOR THE BENTHIC MARINE ALGAE FROM VENEZUELA

Corallophila verongiae (Ceramiaceae, Rhodophyta), una nueva adición para las algas marinas bénticas de Venezuela

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ABSTRACT

Corallophila verongiae represents the first report for Venezuela, it was found growing on coralline substrata in the sublittoral, 6-9 m depth, at two coral reef sites in Morrocoy National Park, Venezuela. The characteristics of the Venezuelan specimens correspond with the more recent description of this species. This report extends the *C. verongiae* distribution to the southern Caribbean.

Key words: Algae, Caribbean, Ceramiales, *Corallophila*, coral reef, Morrocoy

RESUMEN

Se presenta el primer reporte de *Corallophila verongiae* para Venezuela, que se encontró creciendo sobre sustrato coralino en la zona sublitoral, entre 6 y 9 m de profundidad, en dos arrecifes coralinos del Parque Nacional Morrocoy, Venezuela. Las características de los especímenes venezolanos corresponden con la descripción más reciente dada para esta especie. Con este trabajo la distribución de *C. verongiae* se extiende hasta el sur del Caribe.

Palabras clave: Algas, arrecife coralino, Caribe, Ceramiales, *Corallophila*, Morrocoy

INTRODUCTION

Due to its microscopic size and restricted distribution to subtidal habitats, *Corallophila verongiae* (D.L. Ballant. & M.J. Wynne) R.E. Norris had not been detected before in Venezuela, although it has been found for other Caribbean regions up to a depth of 30 m (Ballantine & Wynne 1986; Schneider & Searles

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1998; Cetz *et al*. 2008). It is important to point out that previous phycofloristic studies have been carried out at Morrocoy National Park (González 1977; Hambrook 1979; Gómez 1982; Lobo & Ríos 1985; González & Vera 1994; Narváez 1995; Gil 2001), but some of them were restricted to the intertidal zone and others to subtidal shallow waters lower than 3 m deep. Three previous studies (Gómez 1982; Narváez 1995; Gil 2001) however, included surveys up to 6 m in depth, the two latter were conducted in one of the localities of this study (Cayo Ánimas), and eventhough this Rhodophyta species was not found.

Corallophila verongiae was originally described as a species of the genus *Ceramium* (Ballantine & Wynne 1986). Norris (1993), considering the presence of two acropetal and two basipetal corticating filaments derived from periaxial cells, assigned *C. verongiae* along with some *Ceramium* and *Centroceras* species, as well all the *Ceramiella* species, to *Corallophila* Weber Bosse. *C. verongiae* is one of the eleven species of this genus currently reported for tropical and subtropical coasts, the other species are *C. apiculata* (R.E. Norris) Yamada, *C. atlantica* (A.B. Joly & Ugadim) R.E. Norris, *C. cinnabarina* (Gratel. ex Bory) R.E. Norris, *C. howei* (Weber Bosse) R.E. Norris, *C. huysmansii* (Weber Bosse) R.E. Norris, *C. kleiwegii* Weber Bosse (the type species), *C. itonoi* (Ardré) R.E. Norris, *C. ptilocladioides* (R.E. Norris & I.A.Abbott) R.E. Norris, *C. bella* (Setchell & Gardner) R.E. Norris and *C. eatoniana* (Farlow) T.O. Cho, H.-G. Choi, G. Hansen & S.M. Boo. (Wynne 2005; Guiry & Dhonncha 2008).

Corallophila verongiae is based on subtidal collections from Puerto Rico and Santo Domingo (Caribbean, western Atlantic) from 17 to 30 m in depth (Ballantine & Wynne 1986). The species was subsequently reported from Bermuda by Schneider & Searles (1998) from 15-18.5 m and from Mexican Caribbean at 1.5 m in depth for Cetz *et al*. (2008).

MATERIALS AND METHODS

Venezuelan specimens were collected at two coral reef sites at Morrocoy National Park: Cayo Sombrero and Cayo Ánimas (Playa Mero). The park is located at the west-central coast of Venezuela, between Tucacas and Chichiriviche (10°52' N, 68°16' W) (Fig. 1).

Algae samples were taken with a palette knife and placed in plastic bags containing 4% formalin in sea water. Voucher specimens were prepared as semipermanent slides (in 40% glycerin). Specimens were photographed with a Nikon Coolpix 990 digital camera through a Leica microscope (Model Galen III) and the photographies were submitted to the Herbario Nacional de Venezuela (VEN). Authority abbreviations follow Brummit & Powell (1992).

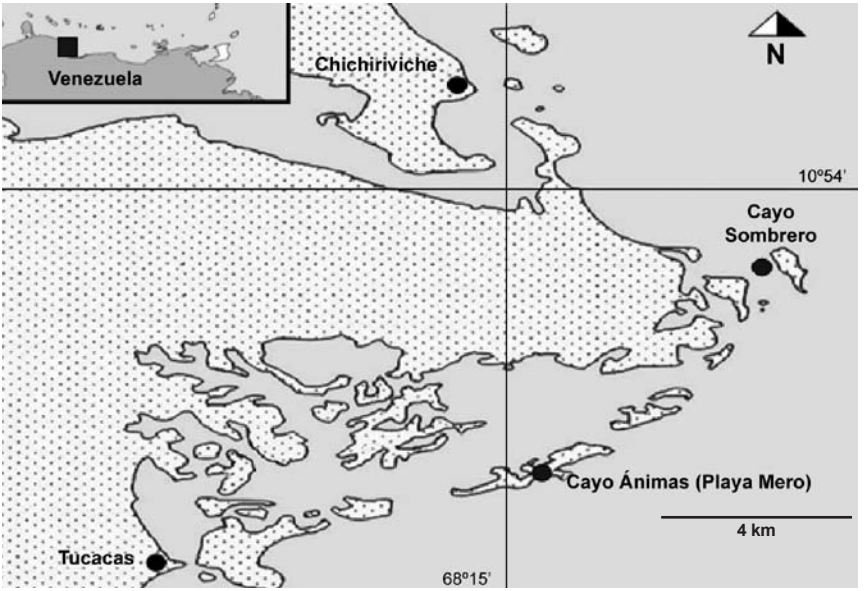

Fig. 1. Geographic location of Morrocoy National Park indicating Cayo Sombrero and Cayo Ánimas.

RESULTS AND DISCUSSION

Corallophila verongiae (D.L. Ballant. & M.J. Wynne) R.E. Norris
Ceramium verongiae D.L. Ballantine & M.J. Wynne

Venezuelan specimens are reddish-brown in color and measure 4 to 6 mm in height. Thalli are complete corticated and grow from a prostrate axis, 90-94 µm in diameter (Fig. 2a). Erect branches, 70-73 µm in diameter, are cut off at regular intervals. The erect branches are mostly simple. Unicellular rhizoids are produced at the nodes, either singly or in groups of two (Fig. 2b). The rhizoids are cut off from periaxial and cortical cells. Six periaxial cells are cut off distally from each axial cell. These give two acropetal filaments consisting of rounded cells, 10 µm in diameter, and two longer basipetal filaments consisting of rectangular cells, measuring an average of 10 µm long and 7 µm broad. The latter cells are regularly arranged in parallel filaments. Tetrasporangia are immersed, whorled and measure to 27 µm in diameter on erect branches (Fig. 2c).

Examined material: Falcón State: Cayo Ánimas (Playa Mero), on dead coral, 9 m, 28/03/2001, *E. Villamizar & J.G. Rodríguez 70* (photo VEN); 6 m, *E. Villamizar & J.G. Rodríguez 75* (photo VEN); Cayo Sombrero, on dead coral, 6

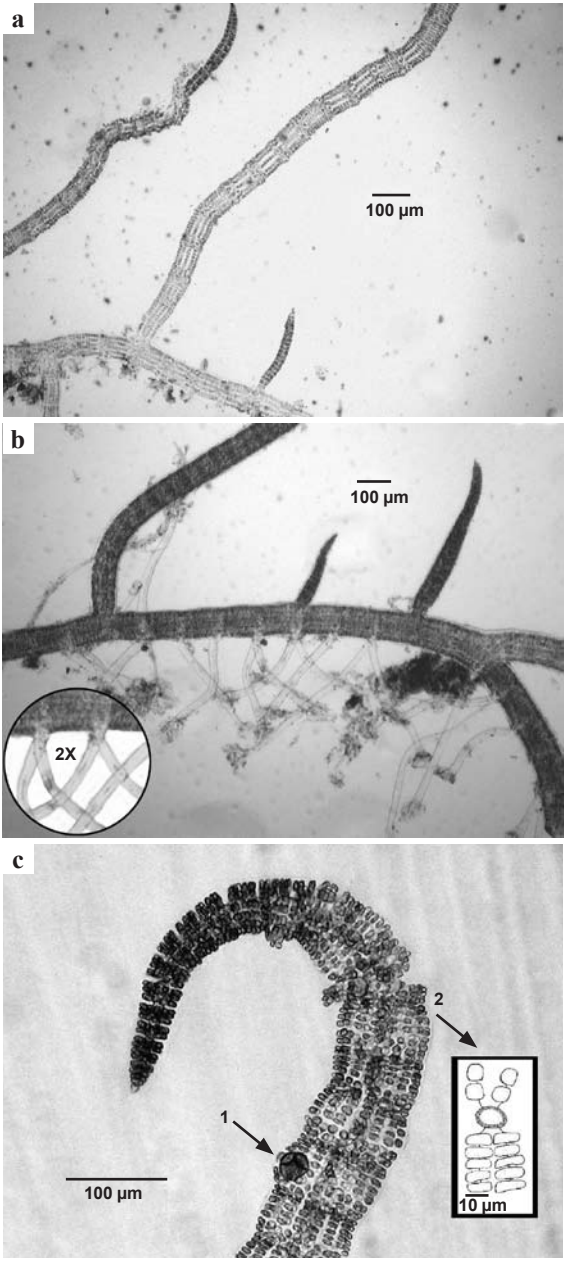

Fig. 2. *Corallophila verongiae*. **a.** Habit, showing erect branches from the prostrate axes. **b.** Unicellular nodal rhizoids on prostrate axes. **c.** Apical region of an erect axis with an immersed tetrahedrally divided tetrasporangia (arrow 1) and diagrammatic illustration of cortication (arrow 2).

m, 08/06/2000, *E. Villamizar & J.G. Rodríguez 10* (photo VEN); 09/07/2001, *E. Villamizar & J.G. Rodríguez 20* (photo VEN)

Corallophilla verongiae could be compared with *C. huysmansii* and *C. atlantica*, species belonging to the same genus. *C. huysmansii* differs from *C. verongiae* in the periaxial cell number, 4 and 6, respectively. *C. atlantica* has been reported for South America, particulary for Brasil (Joly & Ugadin, cited by Guiry & Dohncha 2009), Colombia (Díaz-Pulido & Díaz-Ruíz 2003) and Venezuela (Ganesan 1989). In Venezuela (Aragua State) *C. atlantica* was registrated as *Ceramiella atlantic* (a synonym), it is in the dimensions, more robust than *C. verongiae*, the cortical cells are more elongated and the cortical file number is also larger; however, even both species present six periaxial cells. The studied specimens correspond to the description of this species by Norris (1993), according to the periaxial cell number, cortical cell shape, rhizoid types and clusters, and tetrasporangia arrangement.

Corallophila verongiae is a small and inconspicuous species that was previously known only from the northern Caribbean (Puerto Rico and Mexico) and Bermuda. The present record represent the first report in Venezuela and extends its distribution to the southern Caribbean based on the Venezuelan records.

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BIBLIOGRAPHY

Ballantine, D.L. & M.J. Wynne. 1986. Notes on the marine algae of Puerto Rico II. Additions of Ceramiaceae (Rhodophyta), including *Ceramium verongiae sp. nov*. *Bot. Mar*. 29: 497-502.

Brummitt, R.K. & C.E. Powell (eds.). 1992. *Authors of Plant Names*. Royal Botanic Gardens, Kew.

Cetz, N.P., J. Espinoza, A. Sentíes & L. Quan. 2008. Nuevos registros de macroalgas para el Atlántico mexicano y riqueza florística del Caribe mexicano. *Hidrobiológica* 18(1):11-19.

Díaz-Pulido, G. & M. Díaz-Ruíz. 2003. Diversity of benthic marine algae of the Colombia Atlantic. *Biota Colombiana* 4(2):203-246.

Ganesan, E. 1989. *A catalog of benthic marine algae and seagrasses of Venezuela*. Fondo Editorial CONICIT. Caracas.

Gil, N. 2001. Estudio florístico de las macroalgas marinas que crecen en la localidad de Playa Mero (Cayo Ánimas, Parque Nacional Morrocoy, estado Falcón, Venezuela). Trabajo Especial de Grado. Facultad de Ciencias. Universidad Central de Venezuela. Caracas, Venezuela.

Gómez, S. 1982. Estudio sistemático de las algas macrobentónicas marinas de las islas coralinas, Cayo Borracho y Cayo Sal, Parque Nacional Morrocoy. Trabajo de Ascenso. Universidad Central de Venezuela. Caracas, Venezuela.

González, A. 1977. La vegetación marina del Parque Nacional Morrocoy, estado Falcón. *Acta Bot. Venez*. 12(1-4): 172-207.

González, A. & B. Vera. 1994. Algas. In: *Flora del Parque Nacional Morrocoy* (Manara, B., ed.), pp. 63-126. Fundación Instituto Botánico de Venezuela y Agencia de Cooperación Española. Caracas.

Guiry, M.D. & N. Dhonncha. 2009. Algae-base version 3.0. World-wide electronic publication, National University of Ireland, Galway. Disponible en: http://www.algaebase.org [20 June 2009].

Lobo, M. & N. Ríos. 1985. Catálogo de las algas marinas del Parque Nacional Morrocoy, estado Falcón. *Ernstia* 34: 8-36.

Hambrook, J. 1979. Distribución y abundancia de algas y fanerógamas marinas de la región de Punta Morón y cayos de la zona del Parque Nacional Morrocoy-Tucacas. In: *Ecología del ambiente marino costero de Punta Morón* (*Termo Eléctrico Planta Centro, estado Carabobo, Venezuela*). Intecmar, Universidad Simón Bolívar, Caracas.

Narváez, A. 1995. Ecología de comunidades de algas que se establecen sobre sustratos artificiales en un arrecife coralino del Parque Nacional Morrocoy. Trabajo Especial de Grado. Facultad de Ciencias. Universidad Central de Venezuela. Caracas, Venezuela.

Norris, R.E. 1993. Taxonomic studies on Ceramiaceae (Ceramiales; Rhodophyta) with predominantly basipetal growth of corticating filaments. *Bot. Mar*. 36: 389-398.

Schneider, C.W. & R.B. Searles. 1998. Notes on the marine algae of the Bermudas. 4. Additions to the flora, including *Polysiphonia plectocarpa sp. nov*. *Phycologia* 37: 24-33.

Wynne, M.J. 2005. A checklist of benthic marine algae of the tropical and subtropical western Atlantic: second revision. *Nova Hedwigia* 129: 1-152.