

## STUDIES ON THE MARINE ALGAL FLORA OF VENEZUELA

### 1.— The occurrence of the brown alga *Levringia brasiliensis* (Montagne) Joly in the Caribbean.

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#### RESUMEN

El alga parda *Levringia brasiliensis* (Montagne) Joly (Chordariaceae, Chordariales) se registra por primera vez en el Caribe. Este estudio se basa en colectas realizadas en la isla Margarita (Oriente de Venezuela). También se señalan detalles sobre morfología, anatomía y reproducción, los cuales se basan en ejemplares venezolanos.

#### ABSTRACT

The brown alga *Levringia brasiliensis* (Montagne) Joly (Chordariaceae, Chordariales) is reported here to occur for the first time in the Caribbean based on collection from Margarita island in eastern Venezuela. Details of morphology, anatomy and reproduction based on Venezuelan plants are given.

#### RÉSUMÉ

L'algue brune *Levringia brasiliensis* (Montagne) Joly (Chordariaceae, Chordariales) est enregistrée pour la première fois dans les caraïbes. Cette étude se base sur des récoltes réalisées dans L'île de Margarita (Dans le Vénézuéla Oriental). Sont également donnés des détails sur la morphologie, l'anatomie et la reproduction, détails basés sur plantes Vénézuéliennes.

#### INTRODUCCION

Despite its abundance, the marine algal flora of Venezuela, and particularly the eastern Venezuela has not been studied in any great detail from a taxonomic point of view. While a historical survey of the earlier works on the marine algal flora of this region will be dealt with later, this paper will confine with the occurrence of an interesting brown alga, which does not appear to be known from the Caribbean.

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Genus *Levringia* Kylin, 1940, p. 15.

Species *Levringia brasiliensis* (Montagne) Joly

Family Chordariaceae

Order Chordariales

Sub-class Heterogeneratae

Class Phaeophyceae

This alga was first collected at Point Manzanillo, Margarita island, on 17-11-67 (FV-EKG. Nº 29) on rocks near the shore exposed to moderate to strong surf action. Subsequently it was also found to occur in Playa Caribe, Margarita, under similar conditions on 11-1-68 (FV-EKG, Nº 120), and also on 8-2-68 in both the places during the subsequent collection trip. Although the plants do not occur in any great abundance, the characteristic long slender cylindrical more or less spongy tomentose axes hanging down from the rocks make this readily recognized among the other algae growing in the area. The colour of the living specimens was dark brown with a slight greenish tinge.

#### THALLUS MORPHOLOGY, ANATOMY, AND REPRODUCTION

From a small basal circular disc, arise a number of erect cylindrical dark brown axes (about 3-12). The erect axes are of different heights but in each group there is always distinguishable a dominant axis (Plate 1). Each axis may be of uniform breadth throughout or gradually tapering towards the apex, unbranched or more commonly with small lateral branches of few cms. and terminally simple or bifid or rarely trifid. The height of the plants varied from 8-18 cms. and the breadth of each axis from 1-5 mm.

The axes are densely beset with numerous chromatophore containing assimilators and the central portion (or the medullary region) is constituted by numerous longitudinally running colourless primary filaments and long septate rhizoids arising from them.

The cells of these medullary filaments are regularly arranged and of uniform size (rectangular) in the apical region and of different sizes and shapes in the basal regions. The cells have a diameter of 10-40  $\mu$ .

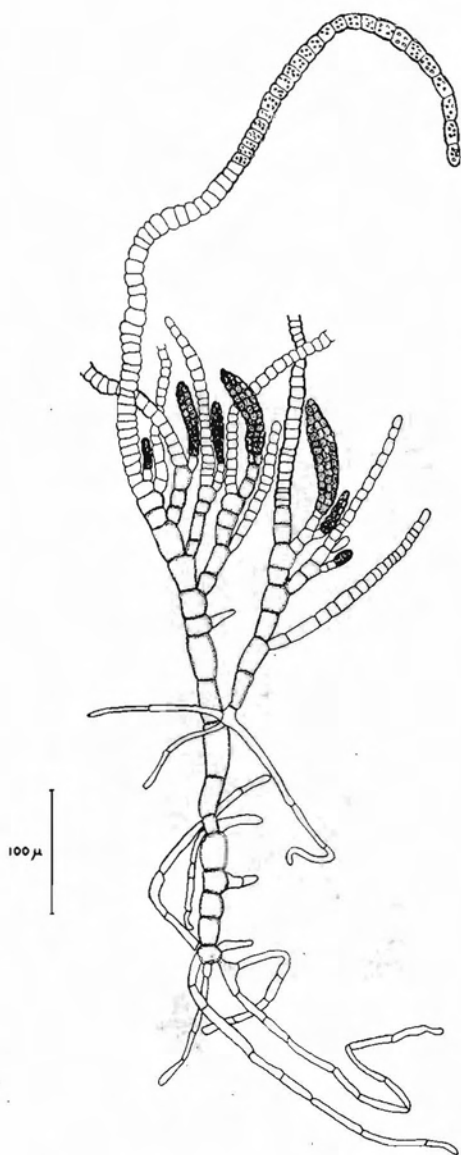


Fig. 1. *Levingia brasiliensis* (Montagne) Joly  
Portion of a medullary filament with rhizoids and cortical region with plurilocular organs.

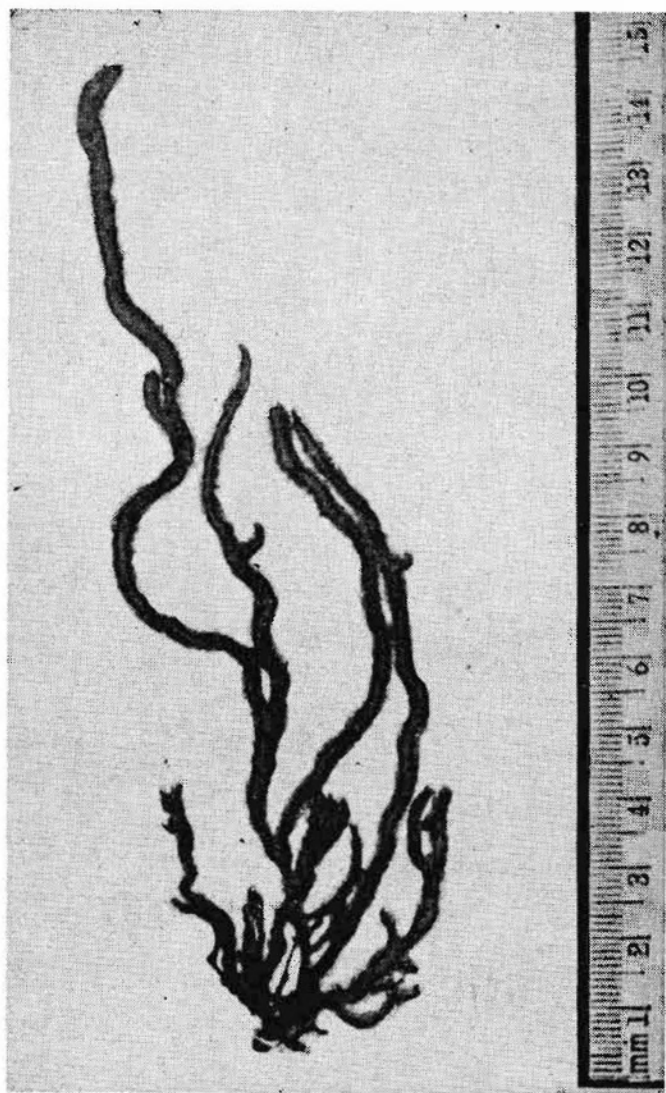


Fig. 2 *Levingia brasiliensis* (Montagne) Joly  
Habit of a plant (from herbarium).

Close below the apex, arise from these medullary cells in all directions a number of slender, colourless, long, septate rhizoids. The rhizoids have a diameter of about 6  $\mu$ .

From the outer surface of the medullary filaments arise the chromatophore containing assimilators, which are free terminally and branched basally. The cells at the base of the assimilators are broader than long and at the terminal region longer than broad. These are 12-18  $\mu$  broad and 9-38  $\mu$  long. The cells contain many small discoid chromatophores.

Plurilocular reproductive organs were observed in abundance being borne at the transition region of the medulla and cortex (Text-Figure 1). Fully developed ones are elongate more or less tapering towards both ends and with a blunt apex. These are attached either by a long stalk of many or by one or few cells. The individual locules are considerably big and about 6  $\mu$  in diameter. The plurilocular organs are 140-150  $\mu$  long and 20-24  $\mu$  broad.

## DISCUSSION

The present alga agrees very closely with the details of anatomy, cell measurements of cortical assimilatory filaments, shape and size of the plurilocular organs given by Taylor (1960; see also Joly, 1957, 1965). In the size of the thallus the Venezuelan plants appear to be slightly more robust than that given by Joly (*loc. cit.*) and Taylor (*loc. cit.*). The point of interest here is that this genus *Levringia* Kylin has so far been reported from Uruguay and Brazil (Taylor, 1960) and Brazil (Joly, 1957, 1965) and has not been known to occur in Venezuela (see Albornoz and Nora de Rios, 1965 for Archipelago Los Roques; Nora de Rios, 1965 for Mochima bay; Rodríguez, 1959 for Margarita island; Hammer and Gessner, 1967 for oriental Venezuela) and also in the Caribbean (see Almodovar, and Blomquist, 1959; Díaz-Piferrer, 1963; Almodovar, 1964 a, b for Puerto Rico; Díaz-Piferrer, 1964 for Cuba; Díaz-Piferrer, 1964 for the Netherlands Antilles, Curacao and Bonaire; Schnetter, 1966 for the Caribbean part of Columbia; Tabb and Manning, 1961; Humm, 1963 and Dawes, Earle and Croley, 1967 for the Florida area and Chapman, 1963 for Jamaica). This record of the occurrence of *Levringia* in the Caribbean considerably enlarges the area of distribution of this genus.

Herbarium specimens on which I have based my identifications are deposited in the "Ficoteca Venezuela" <sup>2<sup>na</sup></sup> at the Instituto Oceanografico, Cumaná with the numbers FV-EKG Nº 29 dated 17-11-67 and FV-EKG Nº 120 dated 11-1-68. Besides duplicate herbarium specimens are also being deposited in the following herbaria: Department of Botany, University of Michigan, Ann Arbor, Michigan; Department of Botany, University of California, Berkeley, California; Department of Botany, University of Hawaii, Honolulu, Hawaii; Institut für Meereskunde der Universität, Kiel, W. Germany.

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I am thankful to Dr. R. A. Curra, Director, Instituto Oceanográfico, Universidad de Oriente, for the privilege of checking the manuscript of the paper by Gessner and Hammer dealing with the taxonomy of the marine vegetation of eastern Venezuela. Professor Celestino Flores kindly translated the English summary into Spanish and señor Adonay Pernia did the photography given in the plate. To both of them I am thankful.

### ADDENDUM

After the above note was submitted to the editor, there came to the attention of the author the publication by Dr. M. Díaz-Piñerel entitled, "Efectos de las aguas de afloramiento en la flora marina de Venezuela" in Caribbean Journal of Science, 7 (1-2) pp. 1-13, 1967 (received in Cumana on March 1, 1968) in which *Levringia brasiliensis* (Mantagne) Joly has been dealt with along with other algae like *Acrosorium uncinatum* (Turner) Kylin, *Porphyra umbilicalis* (Linnaeus) J. Agardh, *Plocamium coccineum* Harvey and *Dictyosphaeria hoytii* Taylor as being associated with the coastal upwelling seen over the continental shelf off the north coast of Margarita island. Hence this report on the basis of priority of publication has to be considered as the first record of the occurrence of *Levringia* in the Caribbean.

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