

ADDITIONS TO THE MARINE FLORA OF BRAZIL. VII.

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INTRODUCTION

This is the third paper of this series to deal with marine algae found along the shores of east and northeastern Brazil. As in the former papers (see Joly 1956, Joly and Cordeiro 1962, Joly and col. 1963, 1965, 1965a, 1966), the species herein described are for the first time reported along the Brazilian shores. Some of the new records are of plants hitherto known only from the Caribbean area, as is the case for instance of *Coelarthrum albertisii*, *Griffithsia caribaea*, *Dictyota linearis* and *Protokuetzingia schottii*. This last named species was previously known only by its type collection (see Taylor 1941) from the Atlantic shores of Colombia. This time we found tetrasporic plants; these were until now unreported for the species. It is also of interest the finding of *Pleonosporium borneri* at the southern shores of the State of São Paulo. This is the first report of this genus along the American Atlantic coasts.

DESCRIPTIONS

Dictyota linearis (C. Agardh) Greville

References: Borgesen 1914, p. 53-54; Taylor 1960, p. 219.

Plants growing in tufts, measuring up to 7 cm high, abundantly and repeatedly dichotomically ramified. Segments of all orders distinctly linear shaped, from 150 up to 600 micra wide (from dried specimens). Intervals between dichotomies up to 10 mm at the base of the plant and a little over 2 mm at the upper portions. Angles between branches acute, and in consequence both portions are directed upwards.

The plants were found at the island of Itamaracá, Pernambuco State. They were collected in the month of February.

This is the first reference of the occurrence of this species on continental South America.

Amphiroa rigida Lamouroux var. *antillana*
Borgesen

References: Borgesen 1917, p. 182, figs. 171-172; Taylor 1960, p. 404, pl. 47, fig. 3, pl. 48, fig. 1.

Plants growing entangled in tufts of *Hypnea musciformis* and other algae, measuring from 4 to 5 cm high, well calcified, very regular and dichotomously branched. Branches widely divergent. Articulations not at points of branching or only very seldom. Segments of very variable size, large, usually 1 to 1.2 mm wide below, less above.

The plant was collected at "Praia de Paracuru", Ceará State, in the month of January and it was sterile. This is the first time that the present species is reported on continental South America.

Coelarthrum albertisii (Piccone) Borgesen

References: Borgesen 1920, p. 404, figs. 389, 390; Borgesen 1929, p. 90; Taylor 1960, p. 482, pl. 61, fig. 6. Plate I, figures 1-4.

Plants of a rosy colour when alive growing in dense tufts, measuring about 2.5 cm high, abundant and repeatedly furcately branched, articulated. The segments are clearly triangular in outline, with the broader part towards the distal portion where at each extremity, on the right and on the left sides, starts a new branch. Each adult segment is about 5 mm long and 3 mm wide, being the upper ones smaller. Fusion of neighbor branches is very frequent, making it impossible to loose the tuft without damaging the plant.

Each segment is a hollow vesicula isolated from neighbors segments by a cellular diaphragm formed by one or two layers of large cells. Structurally the cortex is made out of

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one cell layer, formed by very small roundish cells, measuring about 4 to 6 micra. Below this layer there is to be found one layer of much larger, thick walled cells, measuring up to 80 micra, facing the internal cavity. In certain places, in between the two layers, medium size, isolated cells, sometimes are to be found. Glandular cells are present, facing the cavity upon the large cells. Cystocarps are found scattered over the face or on the margins of the segments, one or sometimes 2 or 3 only. They are hemispherical and protuberant, opening by a distinct pore.

This rare plant was collected only once washed ashore at the "Praia de Itaoca", Municipality of Piúma, Espírito Santo State. Only a plant with cystocarps was secured during the month of April.

This is the first time that this genus and species is reported from Brazil.

Griffithsia caribaea G. Feldmann

Reference: Taylor 1960, p. 515.

Plate II, figures 5-7.

Plants epiphytes, measuring up to 1.5 cm high, forming a small filamentous tuft upon the host. Decumbent portion formed by uniseriate filaments whose cells are 451 micra long and have a diameter of 110 micra being the membrane alone from 32 to 35 micra thick. These filaments are fixed to the substratum by long rhizoids, whose cells are 437 micra long and about 42 micra wide. The erect filaments have cells measuring at the base 360 x 169 micra, in the middle portion 634 x 183 micra and the apex 217 x 84 micra. The thickness of the membrane also varies from 21, 28 and 17 micra respectively from the basal, middle and terminal cells.

Tetrasporangia verticillately placed, about 36 to a node, each on a short stalk measuring 19 x 4 micra. The tetrasporangium has a diameter of about 41 micra, each protected by 8 incurved involucre cells, two of them more developed than the others, when mature. The basal cell which bears the group of tetrasporangia measures up to 440 micra long and is about 330 micra wide.

The plant was found with tetrasporangia in the months of January and May. It was collected at "Praia do Pecém", "Praia de Paracuru", "Barra do Ceará" and "Praia do Mucuripe", State of Ceará and at "Ilha do Francês", Espírito Santo State.

This is the first time that the present species is reported outside the Caribbean region on the American South Atlantic.

Pleonosporium borreri (Smith) Nageli

Reference: Feldmann-Mazoyer 1940, p. 392,

figs. 13, 48, 57, 69, 153a, b.
Plates II, III, figures 1-4, 1-2.

Plants forming dense filamentous tufts, growing isolated, of a rosy colour when alive, measuring from 1.2 to 2 cm high, fixed to the substratum by pluricellular rhizoids having a diameter of about 30 micra. Main axes with a diameter varying from 75 to 225 micra bearing from each segment alternately placed, to the left and to the right sides, one upwards curved lateral branch. The cells of the main axis are from 150 up to 185 micra long. Branching in one place (pinnately) and very seldomly these branches are once rebranched. Here and there on the upper portions of the axis a determinate lateral is replaced by an indeterminate branch, which repeats the branching pattern of the main axis.

Polysporangia produced on the ad-axial side of the upper laterals, on the proximal half of the branch. Polysporangia with a diameter varying from 37 up to 74 micra, not numerous.

Spermatangial bodies sessile, cylindrical, produced on the upper laterals one on each segment, forming small series on the ad-axial side, measuring from 74 to 148 micra long and with a diameter of about 37 micra. Spermatia with a diameter of about 2.4 micra.

Carpogonial branch with 4 cells, sub terminal. The fertile segment of the axis cuts off two pericentrals, one of them will divide further producing the carpogonial branch, the other remains undivided.

Gonimoblasts forming numerous gonimolobes whose development is successive. Carposporangia numerous having a diameter varying from 26 up to about 29.6 micra.

Male, female and polysporic plants were collected during the month of February. The species is not common in the region. It was collected at "Praia do Rio Perequê" on the island of Cardoso, Municipality of Cananéia, São Paulo State.

This is the first reference of the occurrence of this genus and species along the atlantic coast of the Americas.

Protokuetzingia schottii Taylor

Reference: Taylor 1941, p. 100, pl. II, figs. 4-9; 1960, p. 607.

Plate III, figures 3-7.

Plants erect, well branched; erect axis bearing alternately placed, similar in appearance, lateral branches which in turn are branched and rebranched again. Plants measuring about 17 cm high, of a red colour when alive, turning black on drying. Main axes about 1.5 mm wide, first order branches about 1 mm.

Last order branches dissected by oppositely placed determinate, upwards curved, almost evenly spaced branchlets. These are later much more numerous at each node, forming on each side a tuft. Sporangia produced on determinate branchlets, two on each segment, forming two longitudinal rows. Fertile branchlets somewhat flattened with a tuft of short trichoblasts at the apex. Pericentral cells 5, large, clearly visible through the cortex, giving a peculiar appearance (under the stereomicroscope) to the axes even when dried.

Tetrasporic branchlets measuring 2 mm and about 255 micra wide. Tetrasporangium with a diameter of about 90 micra.

This is the first time that sporangia are found in the present species. It is also the first time that the plant is reported after it was described. This is the first reference of the occurrence of this genus and species in Brazil.

The plant was collected at "Praia de Tambaú", João Pessoa, Paraíba State and at several places along the southern shores of the State of Espírito Santo (Piabanha, Itaipava and Acaiaca beaches) always washed ashore. It was found with tetrasporangia in the month of January and May.

We have nothing to add to Taylor's discussion (see Taylor 1941 : 101-102) regarding the generic assignment of the present species. Unfortunately Kylin (1960) in his last monumental work apparently did not notice this peculiar plant.

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SUMMARY

The present paper deals with some marine algae for the first time reported along the Brazilian shores. The following species are considered: *Dictyota linearis*, *Amphiroa rigida* var. *antillana*, *Coelarthrum albertisii*, *Griffithsia caribaea*, *Pleonosporium borrieri* and *Protokuetzingia schottii*.

Some of the findings are for the first time reported for South America. This is also the first reference of the occurrence of *Pleonosporium* on the American shores. Tetrasporic plants are for the first time described for *Protokuetzingia schottii*, a rare plant, until now only known by its type collection. Three plates with numerous drawings are also presented.

SUMÁRIO

O presente trabalho refere o encontro pela primeira vez na costa brasileira de determinadas algas marinhas. As seguintes espécies são tratadas no texto: *Dictyota linearis*, *Amphiroa rigida* var. *antillana*, *Coelarthrum albertisii*, *Griffithsia caribaea*, *Pleonosporium borrieri* and *Protokuetzingia schottii*.

Algumas destas plantas nunca haviam sido mencionadas anteriormente como ocorrendo na costa da América do Sul. Esta é também a primeira vez que o gênero *Pleonosporium* é encontrado na costa atlântica americana. É digno de nota que plantas tetrasporicas de *Protokuetzingia schottii*, uma planta rara, são pela primeira vez descritas. Esta espécie só era conhecida anteriormente pela coleção tipo. Três pranchas com numerosos desenhos completam o trabalho.

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P L A T E S

FLATE I

Figs. 1-4 — *Coelarthrum albertisii*. Part of a transverse section of the thallus. Longitudinal section passing through a diaphragm. Longitudinal section of a fixation disc. Median longitudinal section through a cystocarp.

PLATE II

Figs. 1-4 — *Pleonosporium borreri*. Gonimolobes and part of the involuclral filaments. Formation of the first pericentral cell. The second pericentral is already formed (only one will be fertile). Near mature carpogonial branch.

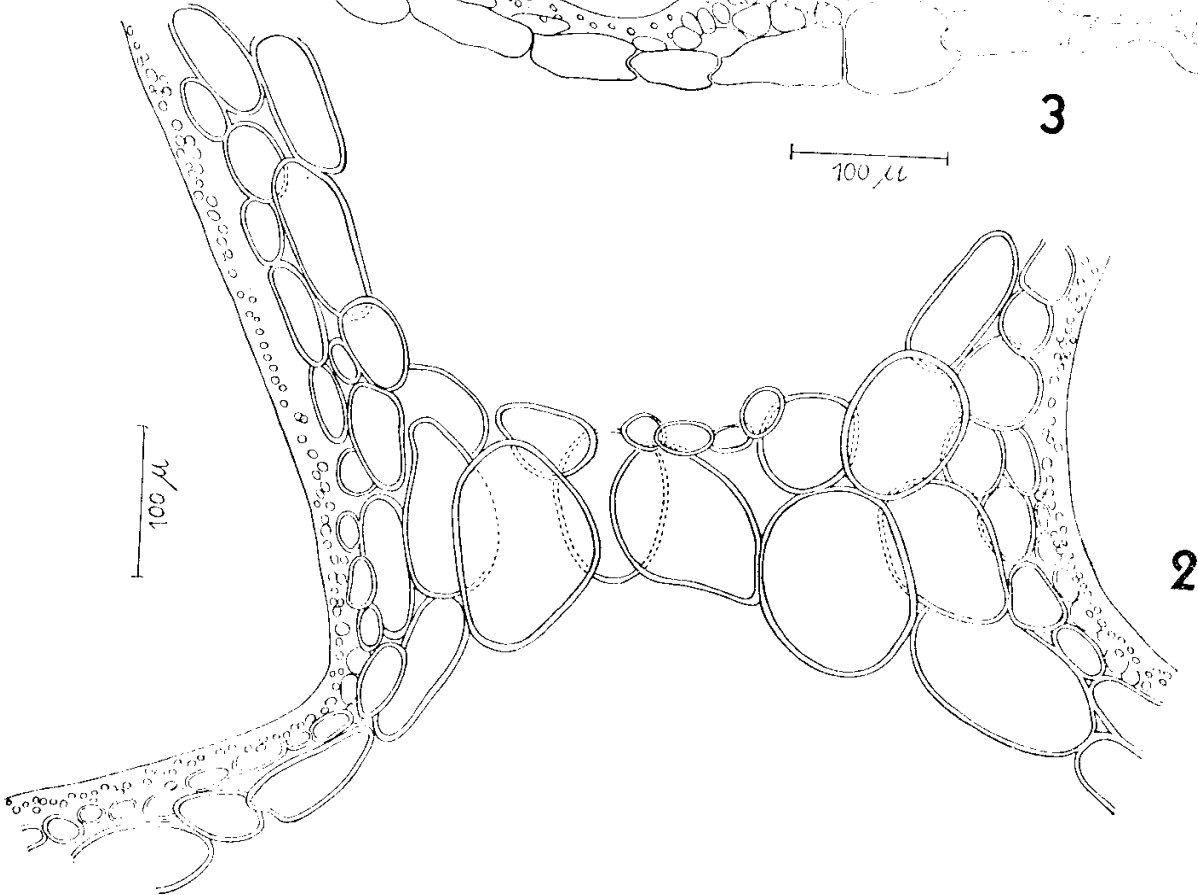
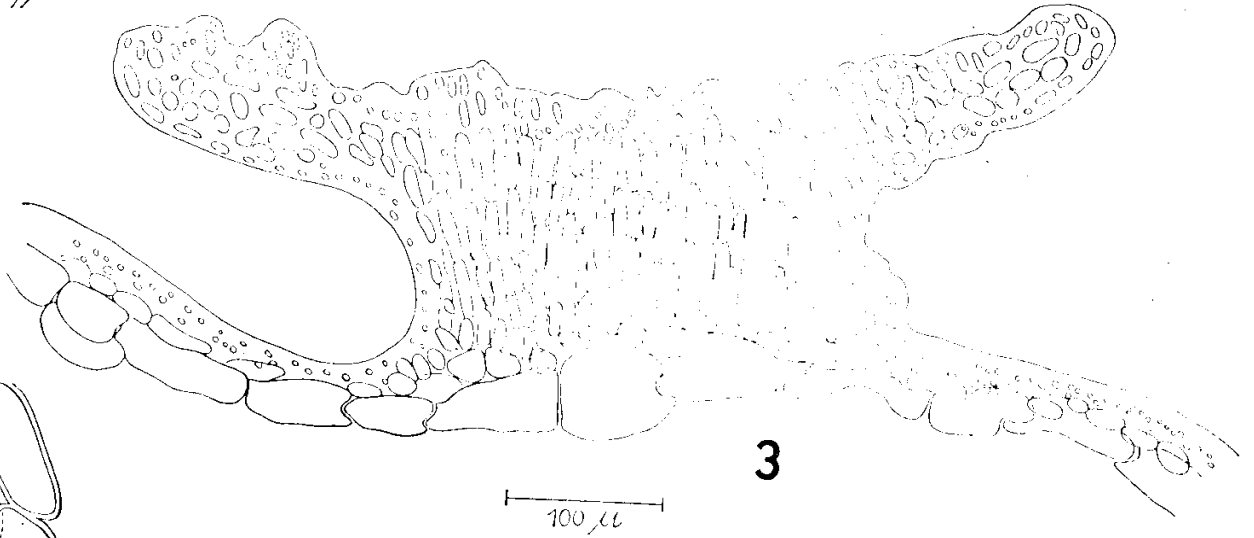
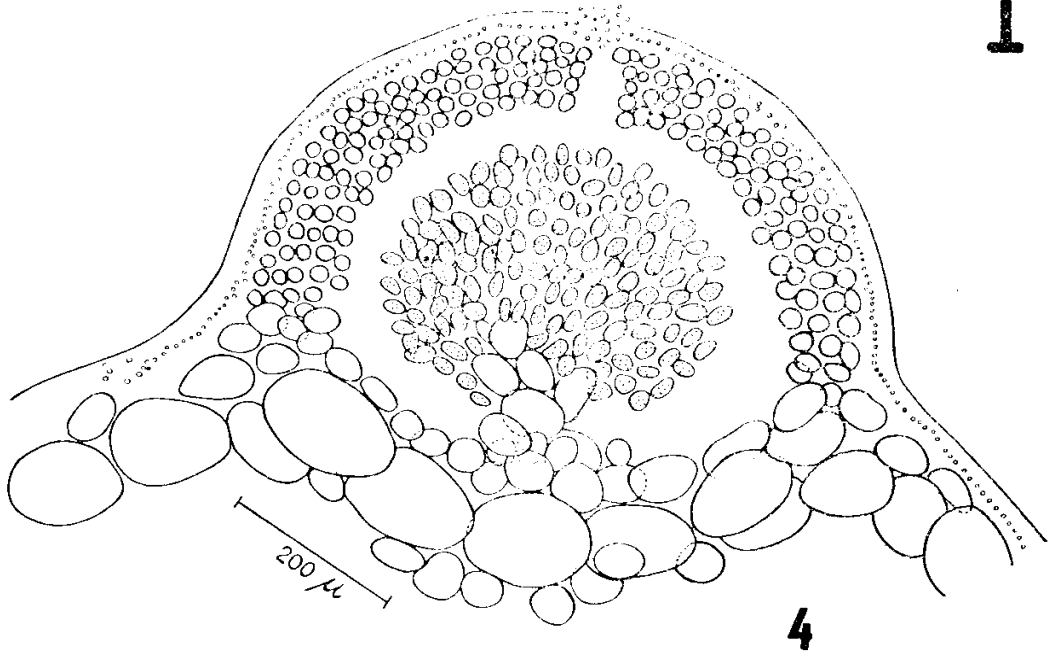
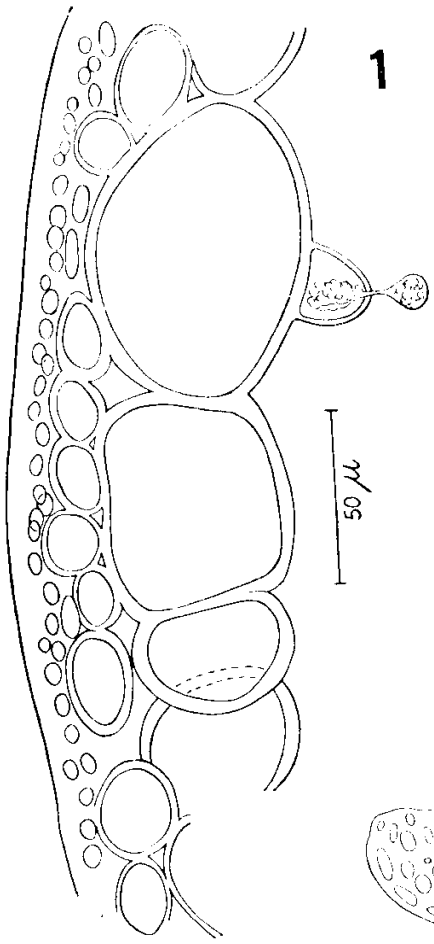
Figs. 5-7 — *Griffithsia caribaea*. Basal portion of the plant showing rhizoids. Upper

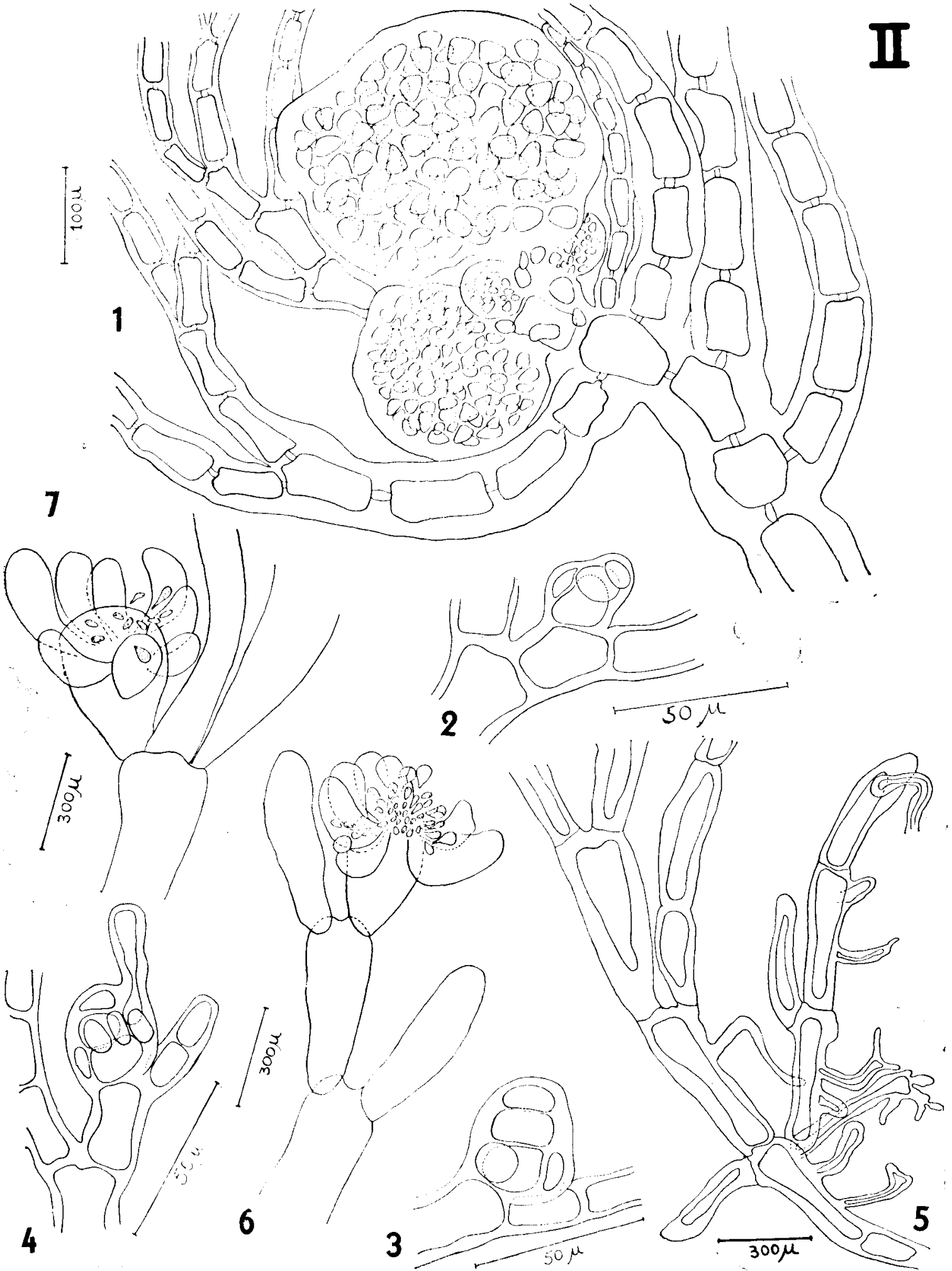
part of a tetrasporic plant, only 7 of the 8 involuclral branches were depicted. Detail of a young tetrasporic branch.

PLATE III

Figs. 1-2 — *Pleonosporium borreri*. Upper part of a fertile plant with polysporangia. Detail of developing polysporangia.

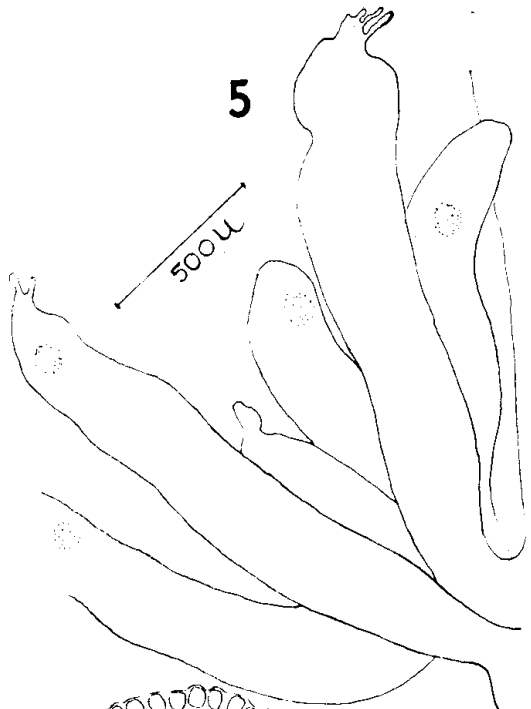
Figs. 3-7 — *Protokuetzingia schottii*. Upper portion of a tetrasporic branch; note the segments clearly visible through the young cortex. Part of a cross section of an upper branch. Tetrasporic branchlets at note. One group of tetrasporic branchlets (all drawings from dried material).





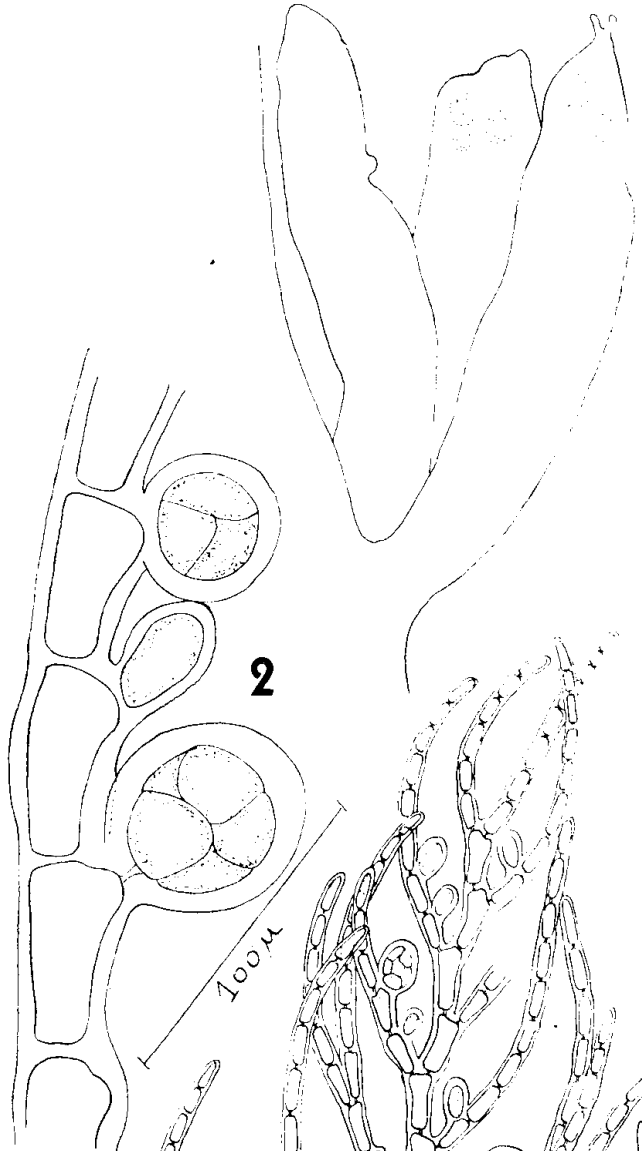
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500 μ



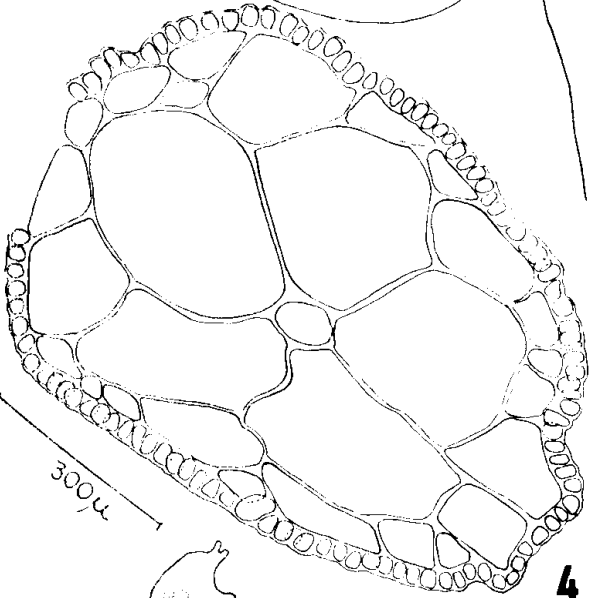
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100 μ



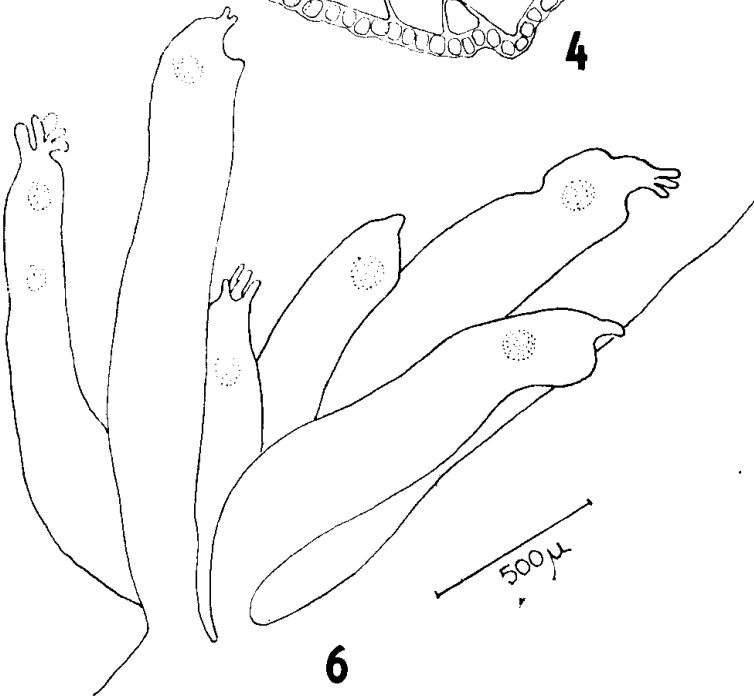
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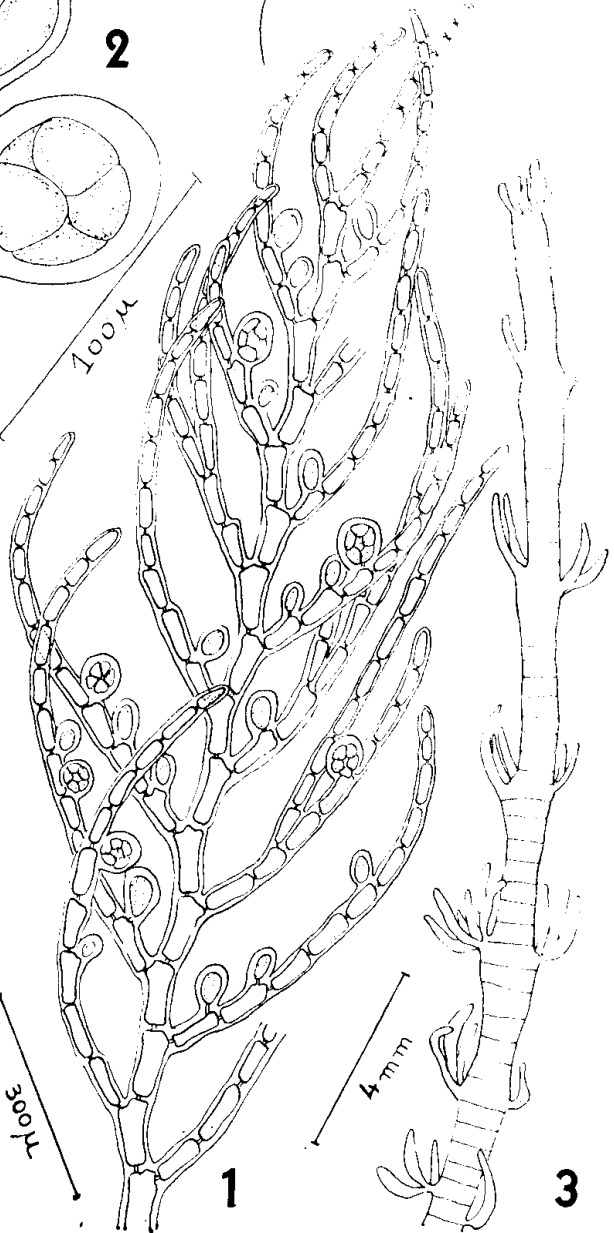
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500 μ



300 μ

1



4 mm

3

