

MARINE MACRO ALGAE OF FALCÓN STATE,
VENEZUELA - 2: TWO NEW ADDITIONS OF
RHODOPHYTA FOR VENEZUELA.

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ABSTRACT

Two minute marine red algae, *Hypneocolax stellaris* Børgesen (Hypneaceae, Gigartinales) and *Acrothamnion butleriae* (Collins) Kylin (Ceramiaceae, Ceramiales), collected in Falcón State, are new records for Venezuela. Both vegetative and reproductive structures are illustrated and described for *H. stellaris*, and vegetative structures for *A. butleriae*.

Key words: *Hypneocolax stellaris*, *Acrothamnion butleriae*, Rhodophyta, marine macro algae, parasitic algae, Venezuela.

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RESUMEN

MACROALGAS MARINAS DEL ESTADO FALCÓN,
VENEZUELA - 2: DOS NUEVAS ADICIONES DE
RHODOPHYTA PARA VENEZUELA

Dos diminutas algas marinas rojas *Hypneocolax stellaris* Børgesen (Hypneaceae, Gigartinales) y *Acrothamnion butleriae* (Collins) Kylin (Ceramiales, Ceramiales) son reportadas como nuevas adiciones a la flora marina algal venezolana, basadas en colecciones del Estado Falcón en el occidente de Venezuela. Se describen e ilustran estructuras vegetativas y reproductivas para *H. stellaris*, mientras que para *A. butleriae* solo se dispuso de material vegetativo.

Palabras claves: *Hypneocolax stellaris*, *Acrothamnion butleriae*, Rhodophyta, macroalgas marinas, algas parasíticas, Venezuela.

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INTRODUCTION

In an earlier paper, Albornoz (1988) gave brief descriptions and illustrations of 20 common species of Chlorophyta from the Paraguaná Peninsula, Falcón State. In this paper, we report as new additions to the Venezuelan marine algal flora, two minute red algal genera (*Hypneocolax* and *Acrothamnion*) collected from the same State.

MATERIALS AND METHODS

Specimens were collected, prepared and identified following standard procedures for marine algal floristic studies, and deposited in the Laboratorio de Investigaciones Biológicas, Departamento de

Biología, Facultad de Humanidades y Educación, Universidad del Zulia, Maracaibo, with many duplicates in the Herbario del Instituto Oceanografico, Universidad de Oriente, Cumaná. The following abbreviations are used: AA = collected by Ramón Acosta and Olga Albornoz, OA = collected by Olga Albornoz.

Specimens examined: Cabo San Román: OA 3011, 14 Sept 1979. Tumatei: AA 2715, 3 March 1979. Tiraya: OA 2770, 14 June 1979; OA 4035, 24 Sept 1993. Supi: OA 424, 2 Oct 1966; OA 638, 2 June 1969. Buchuaco: OA 815, 7 June 1968; OA 2025, 8 June 1975; OA 4010, 24 Sept 1993. La Vela de Coro: AA 1221, 2 Feb 1972; OA 4022, 25 Sept 1993. Cayo Mayorquine, Parque Nacional Morrocoy: OA 1666, 25 June 1975; OA 1812, 13 July 1975; OA 1842, 5 July 1976; OA 1646, 25 July 1977.

OBSERVATIONS AND DISCUSSION

Hypneocolax stellaris Børgesen (Figs. 2 - 9).- In Venezuela, plants of this species were growing on *Hypnea musciformis* (Wulfen) Lamouroux, forming small, sessile pustules 500-1500 μm wide and 300-1000 μm high (see map, Fig. 1). Young developing pustules were wart-like or irregularly lobed, while fully grown mature pustules were nearly stellate with several minute erect axes with an acute or oval, simple or lobed apices joined basally on the host surface (Fig. 2). Formalin preserved material varied from bright red to dull purple. Anatomically, the parasite is uniaxial like the host species and the outermost medullary cells become smaller towards the periphery (Figs. 3 and 4). The small cortical cells (3-7 μm wide) were intensely stained with aniline blue indicating certain contents, while the large medullary cells were irregular (26-60 μm wide), and apparently with a large, central vacuole. Sometimes we observed secondary pit-connections between the host and parasite cells.

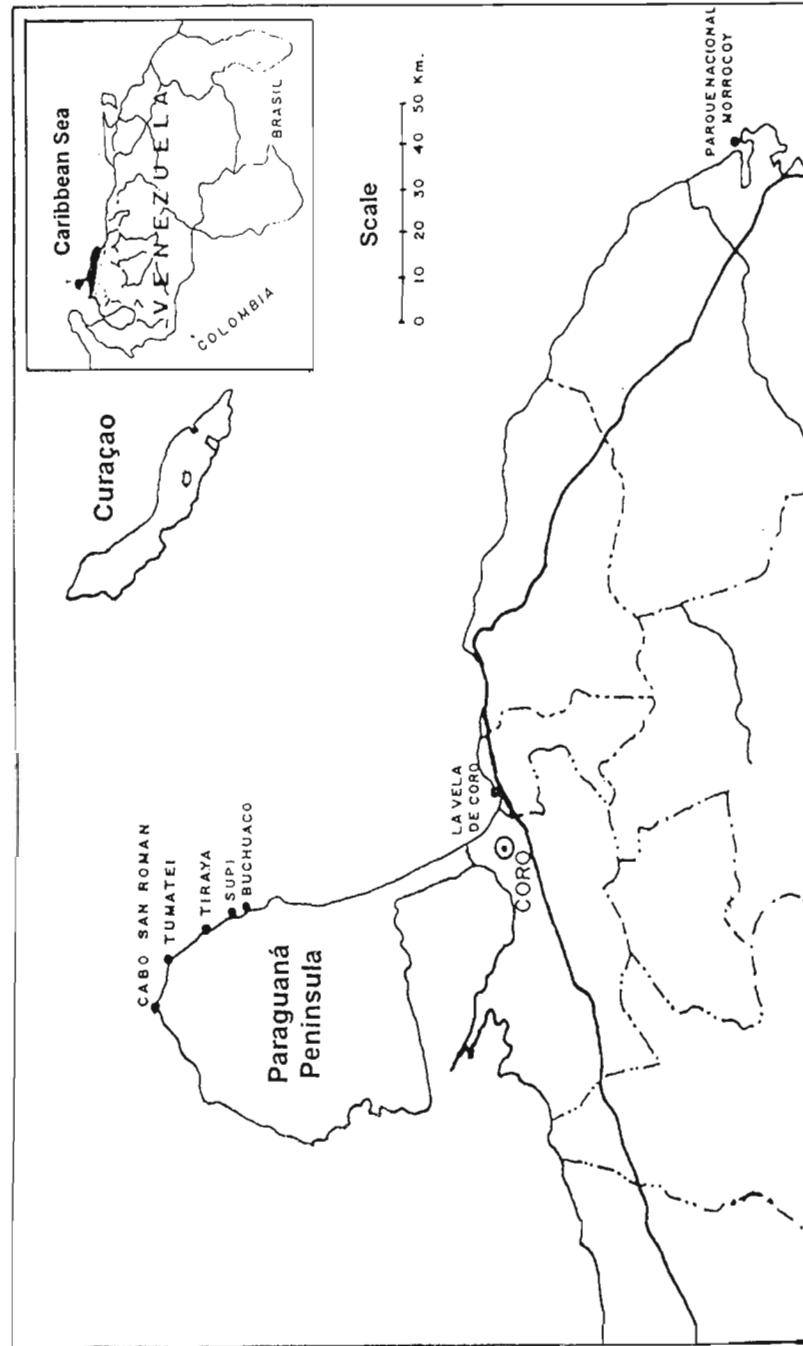


FIGURE 1. Collection sites for *Hypneocolax stellaris* and *Acrothamnion butleriae*.

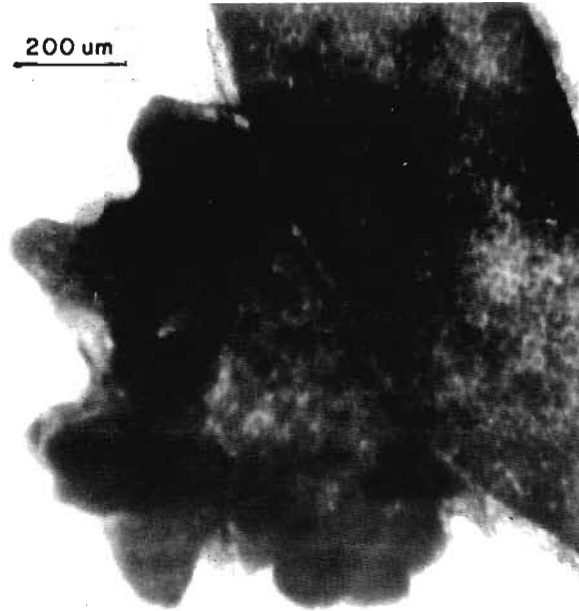
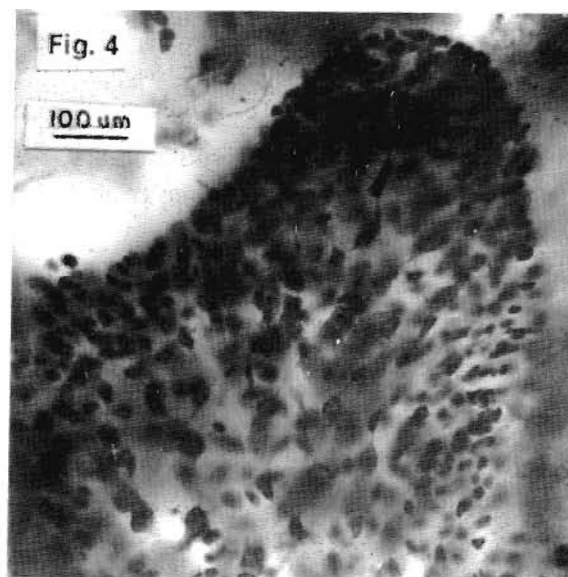
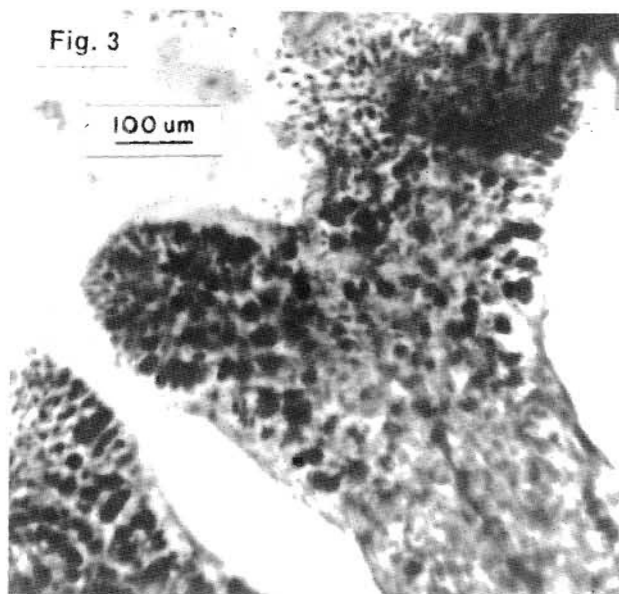


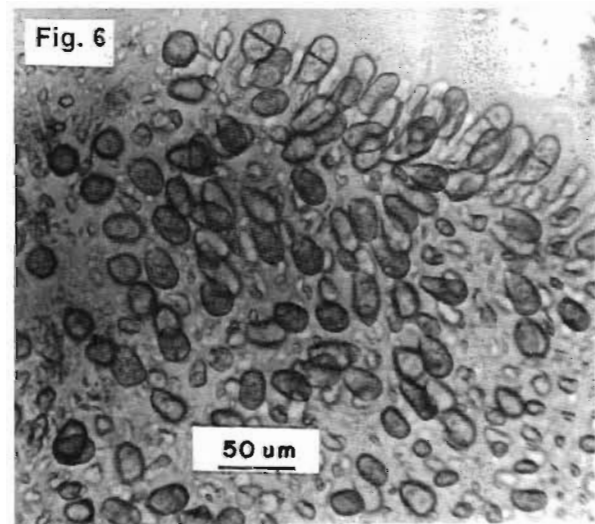
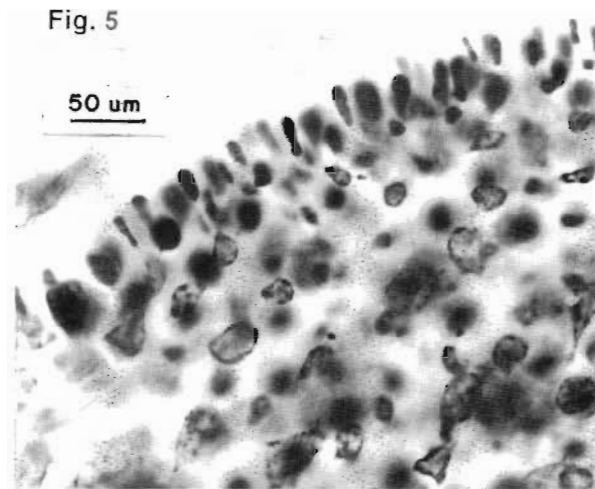
FIGURE 2. *Hypneocolax stellaris*: Pustule of the parasite on *Hypnea musciformis*.

Bisporangia were abundantly produced from the outer cortical cells and distributed on the thallus surface of the pustules (Figs. 5, 6, and 7). Bisporangia ranged from 12-30 μm wide and 23-45 μm long. All asexual pustules examined by us were only bisporic.

Sexual plants were apparently monoecious. Spermatangia and cystocarps occurred together on the same pustule. Each terminal cortical cell produced a small chain of few spermatangia. The male areas are distinctive in that numerous minute spermatangia, in contrast to the sterile cells, were present in extensive irregular patches on the thallus surface (Fig. 8). Three celled carpogonial branches with trichogynes protruding from the cuticle were observed in a few instances. Several sub prominent, spherical to semispherical cystocarps without evident ostioles (each cystocarp approximately 70-170 μm wide, with carposporangia 13-20 μm wide) were commonly present (Fig. 9).



FIGURES 3 - 4. *Hypneocolax stellaris*: Part of squashed pustules showing thallus structure. Note the central uniaxial filament in Figure 3.



FIGURES 5 - 6. *Hypneocolax stellaris*: Developing and mature bisporangia in lateral views.

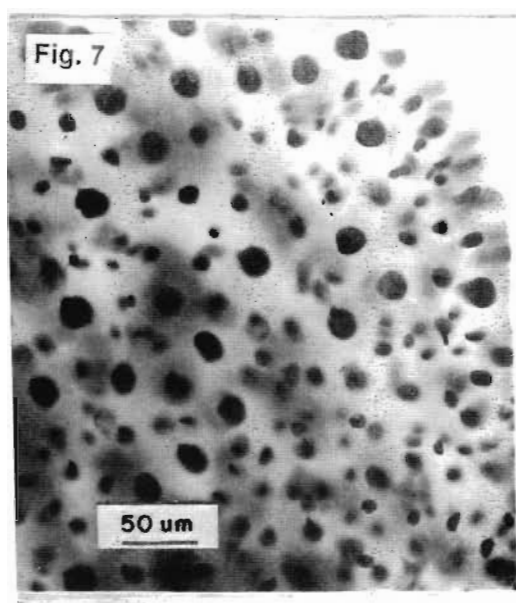


FIGURE 7. *Hypneocolax stellaris*: Bisporangia in surface view.

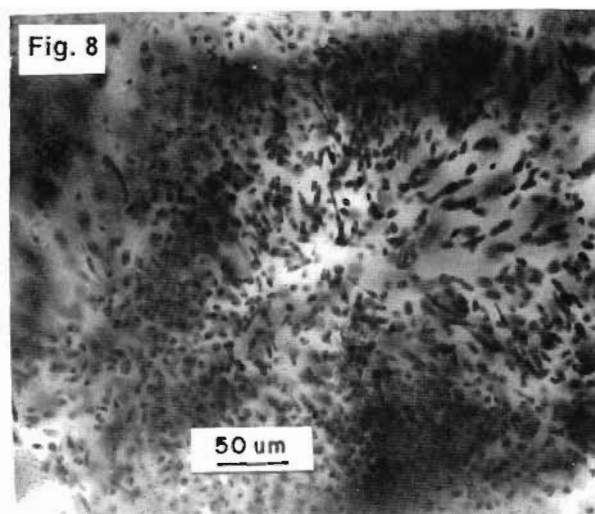


FIGURE 8. *Hypneocolax stellaris*: A squashed male pustule showing the numerous minute spermatangia.

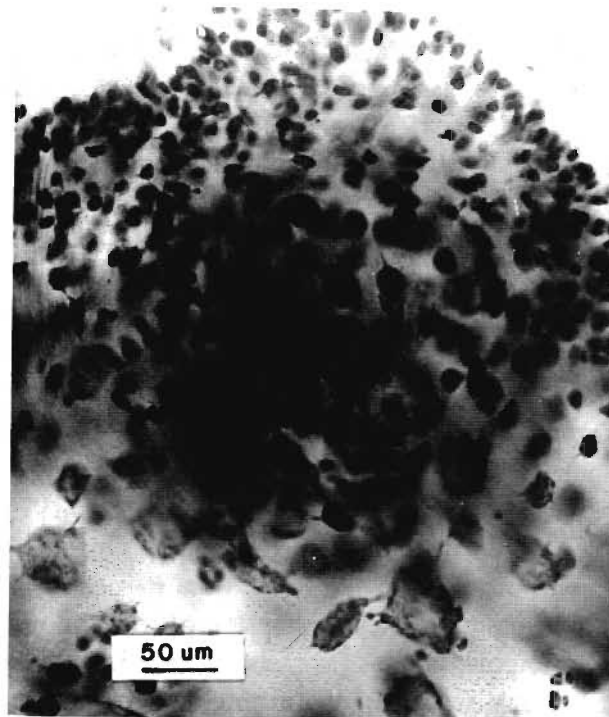


FIGURE 9. *Hypneocolax stellaris*: Cystocarp.

Originally described from the U. S. Virgin Islands (Børgesen 1920), *H. stellaris* is currently known to have a wide geographical distribution, and parasitize at least six species of *Hypnea* (Evans *et al.* 1978, Goff 1982). To these may be added the records of Vroman (1968: Netherlands Antilles), Schnetter (1980: Colombian Atlantic), Soto and Ballantine (1986: Caribbean of Costa Rica), and Aguilar-Rosas *et al.* (1989: Gulf of Mexico), for the tropical and subtropical western Atlantic Ocean; and the fifth species of parasitic red algae to be recorded from this country (see Ganesan 1989, Aponte and Ganesan 1990, Table 1).

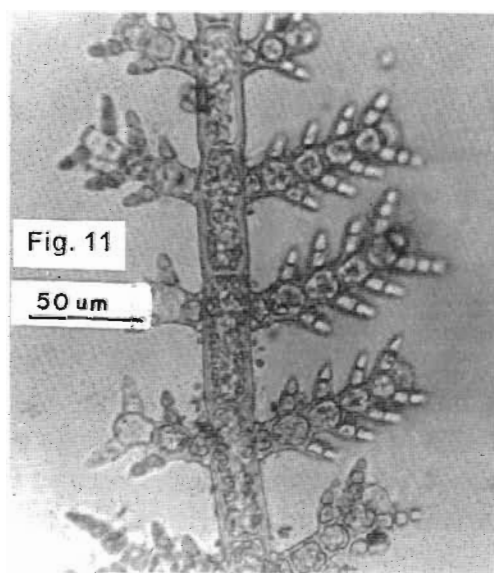
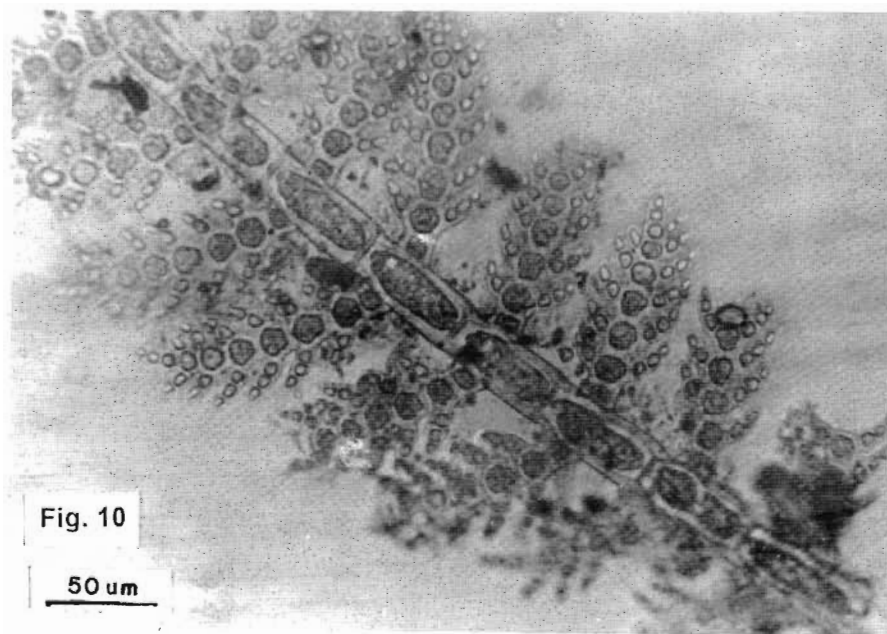
By formation of only bisporangia, the Venezuelan plants are similar to the U. S. Virgin Islands material (Børgesen 1920), while

plants from Japan, Malaya, Pacific Mexico and Hawaii (referred to f. *orientalis* Weber van Bosse) are known to produce zonately divided tetrasporangia (Mshigeni 1976), thus showing an apparent difference between populations occurring in widely different latitudes. Vroman (1968), Schnetter (1980), Soto and Ballantine (1986), and Aguilar-Rosas *et al.* (1989) did not report on the nature of sporangial division in their material. The work of Apt (1984) showed that kappa carrageenan is characteristic of both *Hypneocolax stellaris* and its host *Hypnea musciformis*.

Acrothamnion butleriae (Collins) Kylin (Figs. 10 - 12).- This very minute, up to 5 mm high, and inconspicuous red alga (AA 2715) was collected from Tumatei on 3 March 1979, growing epiphytically on a *Dictyopteris* sp. (see map, Fig. 1). The main prostrate axis was attached to the substratum by prominent, elongate colorless rhizoids ending in stellate haptera. From the prostrate axis, arise a few erect bipinnate axes (branches), naked at the base, but, at the apex, with many short bipinnate pinnulae (branchlets) with 2-4 cells 6-9 μ m wide (Figs. 10 and 11). Vesicular (gland) cells (13-20 μ m wide and 8-11 μ m high) with homogeneous refractive contents were common on many of the apices of pinnae (Fig. 12). Pinnulae also may bear rarely terminal vesicular cells or long, colorless hairs. Fertile plants were not present in the collections examined.

Acrothamnion butleriae is readily distinguished from other minute red algae recorded so far from Venezuela by its diminutive size, arrangement of lateral branches and branchlets in a bipinnate manner and more characteristically by the presence of terminal vesicular cells.

The material studied by us agreed with the description and illustrations given for the Brazilian plants (Ugadim *et al.* 1986). This species also has a wide distribution, being recorded from Africa (Lawson and John 1987), and Japan (Itono 1977). Apparently, reproductive material has not been reported in this species.



FIGURES 10 - 11. *Acrothamnion butleriae*: Parts of erect axes showing the characteristic bipinnate disposition of branches (pinnae) and branchlets (pinnulae).

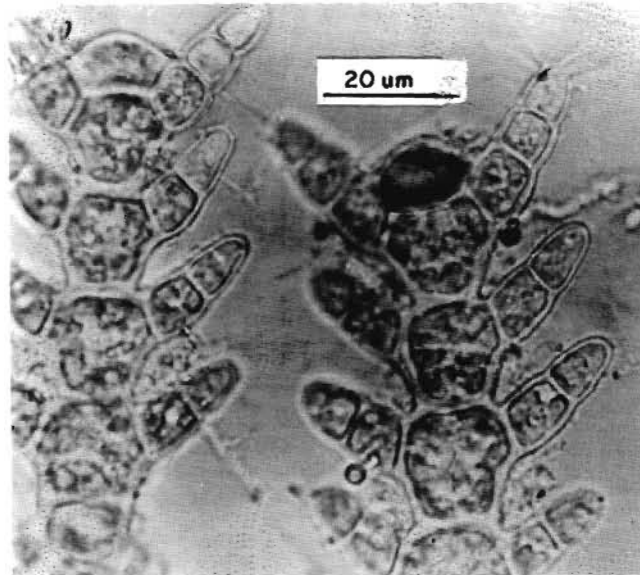


FIGURE 12. *Acrothamnion butleriae*: Apices of two branchlets, each with a terminal vesicular cell.

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