Botanica Marina
Vol. XIX, pp. 313–315, 1976

A Note on the Fate of Tetrasporangial Stichidia in *Hypnea* Lamouroux after Spore Release*

K. E. Mshigeni

Department of Botany, University of Dar es Salaam, P.O. Box 35060, Dar es Salaam, Tanzania, East Africa.

(Received 17. 9. 75)

The fate of the tetrasporangial stichidia has been investigated in *Hypnea cervicornis* and *H. chordacea*. It was found that stichidia are not determinate branchlets as was once thought, but continue with vegetative growth after spore shedding. Even where the stichidia became detached from the main axes after spore shedding, they developed new holdfasts and grew into new thalli.

Introduction

Hypnea Lamouroux is a widespread red alga on tropical and subtropical shores. Its asexual phase reproduces by zonately divided tetrasporangia which are borne at the bases of specialized fertile branchlets, the stichidia (Fritsch 1945, Isaac and Hewitt 1953, Tanaka 1941). Dawson *et al.* (1964) believed that the stichidial branchlets are determinate, implying that they are incapable of continued vegetative development. However, there appears to have been no attempt to prove this belief. The purpose of this note has been to provide additional evidence which would substantiate or disprove this supposition.

Materials and Methods

Tetrasporic fronds of *Hypnea cervicornis* J. Agardh and *H. chordacea* Kützing from Diamond Head Beach Park, Oahu Island (Hawaii) were used as research material. Samples of the tetrasporic fronds were fixed in 3% formalin in seawater. Other samples were induced to shed their spores in a Psychrotherm controlled environmental growth cabinet set at 25 °C. After releasing their spores, the fronds were cultured in the growth cabinet for 20 days. The growth chamber was provided with fluorescent cool-white light bulbs, a light intensity of 200 ft-c and a photoperiod of 12L:12D. A modified Instant Ocean culture medium, changed every four days, was used throughout. This consisted of 50% seawater, 50% Instant Ocean (source and preparation as in Stein 1973) and 50 mg/l sodium nitrate. The medium had proved to support healthy growth of *Hypnea* in earlier experiments.

At the end of the cultural period the thalli were fixed in formalin and later their stichidial branchlets were examined and compared with those of the original samples fixed in formalin. This was done using a Zeiss compound microscope. Photomicrographs of the observed structures were taken with a Minolta SRT 101 camera and microscope adaptor.

Results

It was observed that after liberating their spores, the stichidia undergo active growth and transform into normal vegetative branchlets. Even in unshaken cultures where some of the tetraspores germinated and started their development within the bases of the stichidia (Figs. 1 and 2), there was a simultaneous vegetative development of the upper parts of the stichidia. This was especially pronounced in *Hypnea cervicornis*.

In some cases, especially in *Hypnea chordacea*, the bases of the stichidia disintegrated (Figs. 3 and 4) and eventually fell off from the main axes after tetraspore discharge. When this occurred the basal portions of the detached stichidia produced new holdfasts (Figs. 5 to 7) which served for attaching the fallen off stichidia to the walls of the culture flasks. From the detached stichidia, new *Hypnea* fronds were produced.

Discussion

The above information on the culture of these two species strongly indicates that *Hypnea* stichidia are not determinate as believed earlier (Dawson *et al.* 1964). This is further substantiated by the fact that the tips of the stichidia possess a meristematic apical cell resembling that of vegetative branchlets.

* Based on part of a thesis (Mshigeni 1974) submitted to the University of Hawaii in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Botany.