Botanica Marina
Vol. XIX, pp. 309–311, 1976

On the Development of Hyaline Hairs in *Hypnea* Lamouroux (Rhodophyta, Gigartinales)*

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 development of hairs in the carpospore and tetraspore germlings of *Hypnea cervicornis* J. Ag. and *H. chordacea* Kütz. has been investigated for the first time. The hyaline hairs developed under all culture media tested and also under both bright light (1000 ft-c) and dim light (100 ft-c). They were more numerous near the actively growing apices of the sporelings than on the mature basal portions, suggesting that they possibly play some unknown metabolic role.

Introduction

The occurrence of unicellular hyaline hairs in the red algae is well documented in the literature (Dixon 1973). Boergesen (1920) was first to note hyaline hair cells in *Hypnea* Lamouroux and he further observed their abundance more in littoral than in deep water specimens. He therefore suggested that their development is promoted by high light intensity. Kylin (1930) also commented on the hairs of *H. musciformis* (Wulf.) Lamouroux, stating that they are ephemeral in nature and can be detected only on the young portions of the thalli. However, it is not known whether the embryonic stages of *Hypnea* also produce hyaline hairs. The present paper deals with the development of hyaline hairs. It was conducted in an attempt to advance our knowledge in this area using two species of *Hypnea* from Hawaii.

Materials and Methods

Carpospores and tetraspores from fertile fronds of *Hypnea cervicornis* J. Ag. and *H. chordacea* Kütz. collected from Diamond Head Beach Park, Oahu Island (Hawaii) were settled on glass slides and cultured in the laboratory. Four culture media (changed every four days) were used, viz., millipore filtered seawater (millipore filter of 0.45 μm pore size), medium cited in McBride and Cole (1972), Provasoli's (1968) medium, and a modified Instant Ocean medium consisting of 50% seawater, 50% Instant Ocean (source and composition as in Stein 1973) and 50 mg/l sodium nitrate.

Culturing was done in a Psychrotherm environmental growth cabinet supplied with fluorescent cool-white light bulbs, and a photoperiod of 12L:12D. This was set at a temperature of 25 °C. Four levels of light intensity were provided: 100, 400, 700 and 1000 ft-c, the lower levels being obtained by screening with black nylon netting. Samples of the sporelings were taken periodically and studied under a Zeiss compound microscope. Photomicrographs of the observed structures were taken with a Panatomic – X film using a Minolta SRT 101 camera and microscope adaptor.

Results and Discussion

In both *Hypnea cervicornis* and *H. chordacea* the developing carpospore and tetraspore germlings produced hyaline hairs within the first four days of culture. The hairs were especially numerous during the second and third week of sporeling development (Fig. 5).

A hyaline hair started its development as a carpogonium-like cell on the periphery of the sporeling (Figs. 1 and 2). Initially such a cell had a clavate head, a narrow neck and a swollen base, and was associated with local secretion of mucilage. After undergoing pronounced elongation, the carpogonia-like cells were metamorphosed into hyaline hairs (Figs. 3 and 4). The longer hairs attained a length of 100–400 μm. As shown in Figure 5, the firstly formed hairs soon disappear and only those near the young apices remain visible. Hair cells were formed under all the cultural conditions used in the present study.

* Extracted from a dissertation submitted to the Graduate Division of the University of Hawaii in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Botanical Sciences, 1974.