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P. Ampili, M. V. N. Panikkar and V. D. Chauhan: Male organs of *Sarconema filiforme* (Sonder) Kylin (Rhodophyta)

Key Index Words: Gigartinales; male organs; Rhodophyta; Sarconema filiforme.

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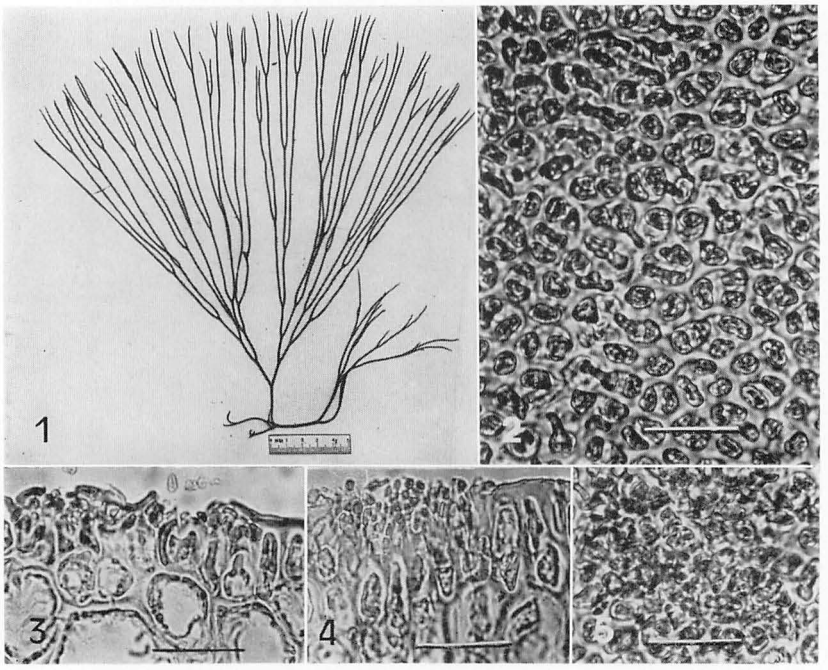
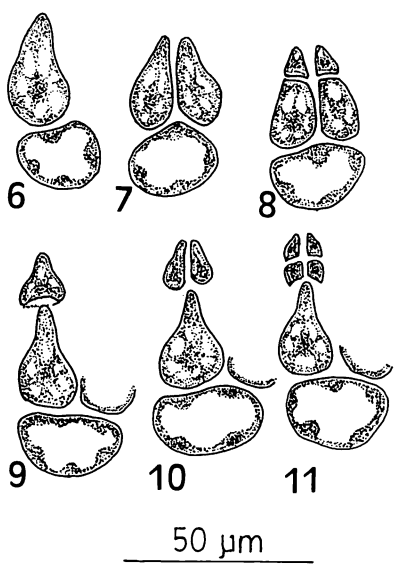
The male reproductive organs of Gigartinales have been studied by a number of investigators (Kylin 1932, Hewitt 1960, Min-Thein and Womersley 1976, Gabrielson and Hommersand 1982). The detailed pattern of development of the male organs in most of the species is still unknown (Min-Thein and Womersley 1976). Often it seems to be difficult to separate male plants from female and tetrasporic ones. In general, spermatangial sori are scattered on the surface of the male plants. The peripheral cells are cut off two or more ovoid or spherical spermatangial



Figs. 1–5. *Sarconema filiforme.*
Fig. 1. A male plant. Fig. 2. Surface cells showing early stages of spermatangial development. Figs. 3 & 4. Sections of the thallus with early division stages and the liberation of the spermatangia. Fig. 5. Surface view of the spermatangial sorus. Bar=50 μm.

mother cells, each of which cuts off two or more spermatangia (MIN-THEIN and WOMERSLEY 1976). However the actual pattern of the spermatangial development may slightly vary in different species.

Sarconema filiforme taxonomically belongs to the family Solieriaceae in Gigartinales. It is a tropical carrageenophyte, which contains higher percentage of phycocolloids (HOPPE 1979). The taxonomy and reproductive morphology of female and tetrasporic plants have been studied by PAPENFUSS and EDELSTEIN (1974). The male plants and the development of the male organs have not been described so far. Considering its economic importance, as a part of thorough investigation of the species, the male plants and the spermatangial development were studied separately.



Figs. 6–11. Stages of the spermatangial development in *Sarconema filiforme*.
Fig. 6. A peripheral elongated cell. Fig. 7. Initials of the primary spermatangial cells. Fig. 8. Upper small primary spermatangial mother cells and lower large basal cells. Fig. 9. Cap like primary spermatangial mother cell and the basal cell with elongated upper region. Fig. 10. Two spermatangial mother cells. Fig. 11. Four separated spermatangia.

Male plants of *Sarconema filiforme* were collected in September 1982 from the Porbander coast of Gujarat. They were 18–25 cm in height and branched dichotomously as the tetrasporangial and female plants (Fig. 1). However, they were slender with a pale yellow colour. The spermatangial sori were found as patches on the branchlets and the main axis. By close observation rough dot like appearance of the sori could be very easily recognisable with the naked eyes. The sori were localised irregularly on the surface. The observed pattern of spermatangial development is summarised below.

The peripheral cells are elongated and they measure $25.5–29.5 \times 14.5–17.5\ \mu m$ (Fig. 6). Each of these divides longitudinally to form two cells (Figs. 4 & 7), and they function as the initials of the primary spermatangial cells (IPSC). Each divided cell cuts off a small upper primary spermatangial mother cell (PSMC). The lower cell elongates and presses the upper PSMC towards outside, and often comes out of the cuticle (Fig. 8). The basal cell has a swollen base and an elongated upper region, while the PSMC remains as a cap-like structure (Figs. 2, 3 & 9). The latter divides longitudinally to produce two cells (Fig. 10). Each of these functions as the spermatangial mother cell (SMC), and cuts off 2–3 spermatangia which liberate outside (Figs. 4, 5 & 11). Each spermatangium measures $2.5–3.5\ \mu m$ in diameter.

The developmental pattern of male reproductive organ in *Sarconema* is slightly different from the typical pattern as described in *Hypnea* (HEWITT 1960), in *Callophycus* (MIN-THEIN and WOMERSLEY 1976) and in *Solieria* (GABRIELSON and HOMMERSAND 1982). However, the general pattern of development and the size of

the spermatangia are almost similar in all the members of Gigartinales.

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新 刊 紹 介

西澤一俊（1986）ワカメが高血圧も成人病もハネ返す 主婦の友社，191頁，690円

健康食品海藻，ミネラルとビタミンに富むシーヴェジタブルなどのキャッチフレーズとともに海藻の食品化が喧伝され，それに伴って最近一般家庭向に書かれた海藻食品の小冊子の幾つかが店頭を飾るようになった。しかし，題名や宣伝文ほどに内容が満足出来るものは少なく，このところ健康食品としてこの海藻の優秀性をわかりやすく書いた本の出現が待ち望まれていた。今回出版された本学会元会長西澤一俊博士の「ワカメが高血圧も成人病もハネ返す」は一見奇をてらった題名と言えなくとないが，内容はそうではなく，実に科学的に人体生理と薬理の立場から海藻の効能を誰にもわかるように解説している。一例として，コンブやワカメのヌメリの記述を紹介しよう。“コンブを一片コップの水につけておくとトロッとした成分がとけ出します。この上澄みを毎日飯んでいると動脈硬化や高血圧，脳卒中が防げるといわれています。この上澄みに出てきたのは「ヌメリ」の成分で，ヌメリはアルギン酸とフコイダンという多糖類にわずかにタンパク質がまじったものです。この多糖類は①消化吸収されにくい，②酸性で種々のミネラルと結合しやすいことが大きな特徴です。コンブやワカメに含まれるアルギン酸はカリウムやカルシウムなどと結合した形で存在し，強い酸性状態の胃の中ではこれらのミネラルを分離します。腸の中は胃と反対にアルカリ性です。そこで改めてミネラルと結合しようとするのですが，このとき一番手近にあって量の多いのは食塩が分解してできたナトリウムイオンです。アルギン酸は体内にカリウムやカルシウムを残し，血圧を上げるナトリウムを道づれにした形で便の中に出てくるのです。こうして血圧を下げる働きをすることになるのです。

文章は多少かえてあるが，ほぼこういった調子で，時に成分表や臨床実験例などをあげ，ワカメを主体として海藻と動脈硬化，脳卒中，制ガン，ミネラル，美容との関係などを5章にわたってわかりやすく解説している。さらに各章には料理研究家，木村民恵氏によるワカメ料理が紹介され，その数は計50に及ぶ。栄養面から海藻を活用したいと考える人々に広く推奨したい本であり，また藻類の専門家にも教えられるところが多く，充分読みごたえがある。

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