

## Chromosome Observations Relating to Bispore Production in *Gelidium pristoides* (Gelidiales, Rhodophyta)

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### Abstract

Chromosome counts of bispore and carpospore germlings of *Gelidium pristoides*, during mitotic metaphase, were  $n = 13–17$ ,  $2n = 28–33$ , respectively. This confirms that bispore production in the species is the product of normal meiosis in the sporophyte generation, and analogous to tetraspores seen in most other members of the Gelidiales.

### Introduction

Reproductive structures of the intertidal agarophyte *Gelidium pristoides* (Turner) Kuetzing are typical of the genus except for the production of bispores (rather than tetraspores) in the sporophyte generation. Previous observations suggested that these bispores were the product of normal meiosis (Carter 1985). The purpose of the present study was to confirm this by comparing chromosome numbers in germlings derived from bispores and carpospores.

### Material and Methods

Fertile bisporophytic and carposporic fronds (collected from Dalebrook in the Cape Peninsula during February and March 1986) were suspended over glass slides in petri-dishes containing millipore-filtered seawater (pore size =  $0.45 \mu\text{m}$ ). The following day the fronds were removed, and the released spores allowed to germinate to the 1–4 cell stage.

The germlings, which by now had become attached to the glass slides, were fixed in 3:1 alcohol/acetic acid for an hour, thoroughly washed in distilled water,

then stained for half an hour using aceto-iron-haematoxylin-chloralhydrate (Wittmann 1965).

The next procedure involved careful heating of the slides over a steam bath, and was crucial to obtaining good clearing of the cytoplasm and well stained chromosomes. Repeated short exposures to heat produced the best results. Destaining was not carried out since this caused a deterioration in cytoplasm clarity.

Fifteen chromosome counts were made of each germling type. Photographs were taken using Ilford Pan F (ASA 50) and FP 4 (ASA 125) black and white film.

### Results

Counts were made of chromosomes in mitotic metaphase during the early development of germlings derived from carpospores and bispores. Chromosomes were best seen during the early 1–4 celled stages of germling development.

Chromosome counts ranged between 13–17 in bispore germlings (Figs 1 and 2), and between 28–33 in carpospore germlings (Figs 3 and 4). Figure 5 provides a map of chromosomes seen in Figures 1–4. Chromosomes were about  $0.5 \mu\text{m}$  in diameter, and could be clearly distinguished from one another and from surrounding cytoplasmic objects.

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