On the reproductive biology of *Grateloupia doryphora* (Montagne) Howe: Phenology and spore propagation

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INTRODUCTION

Phenological behaviour dominates literature concerning the reproductive biology of algae. Day-length, temperature and irradiance seem to be factors that control the induction (maturation, liberation, etc.) of reproductive structures. Less is known about the final destination of the spores formed, i.e. propagation potentiality. It is also clear that vegetative propagation contributes to maintance of algal populations.

This work deals with the ecology of the reproductive phenology of *Grateloupia doryphora* (Montagne) Howe, and with the in vitro propagation of the spores.

MATERIAL AND METHODS

Field experiments. The study comprises an intertidal area at NE of Gran Canaria (Canary Islands). The area was divided into four sampling zones in which we followed the reproductive status of the species. In the Laboratory, carposporophyte and tetrasporophyte of *Grateloupia doryphora* were identified under stereo an light microscope. The fresh weight of samples were recorded.

Laboratory experiments. Inmature carposporophytes were exposed to 18:6, 12:12, 6:18 (ligth:dark) photoregimes and 17° C temperature for 6 days. Percentage of mature carposporophytic thalli and number of cystocarps per area (3 mm.) were recorded.

Disc fragments (3 mm. ø) were excised from carposporophyte-bearing and tetrasporophyte thalli. The explants were processed as described in ROBAINA *et al* (1990 a,b; 1991) to obtain aseptic spores in agarised PES medium. After 30 days, the spores (actually spore-germlings) were easily recultivated in the same culture medium (control). 400 carpospores and tetraspores were cultivated in PES agarised medium (in petri dishes with 6 to 10 spores per treatment) with three plant hormones: 2,4-dichlorophenoxyacetic acid (2,4D), 6-benzylaminopurine (6-BAP) and gibberellic acid in concentrations of 10^{-3}M and 10^{-6}M. Reculture each 15 days. The index "number of new exes / spores" was followed during 30 days.

Propagative potential of the carpospores was followed in liquid PES medium by cultivating in 500 ml bottles with non aseptic aireation. Fresh weight of carposporelings in each bottle (17) was followed every five days during three months. Reculture each 5 days Data analisys was done by using tblcurve software.

RESULTS

Spatial variation: As expected, the total biomass varied among sampling zones, probably related to more or less exposition to the wave action. There was no significative variation in the reproductive status (biomass of carposporophyte and tetrasporophyte) among sampling zones.

Seasonal variation: Total biomass and biomass of tetrasporophyte varied among three seasons through the year as revealed by statistic SAS analisys. The biomass of thalli bearing cystocarps did not varied along the year. Though, laboratory experiments showed the effect of different photoregi-

mes on maturation of carposporophyte as 50% induction was achieved only in 6:18 and 12:12 (in 6 days).

Propagation: No differences were observed in the index "number of new exes produced per spore" when cultivated in PES or PES supplemented with gibirellic acid (10^{-3}M and 10^{-6}M), 6-BAP 10^{-6}M and 2,4-D 10^{-6}M. At 10^{-3}M both 6-BAP and 2,4-D inhibited the regeneration of new exes. The transference of spores from PES plus 10^{-3}M 2,4-D to PES promoted a strong increase of exe regeneration in 7 days (near to 25 compared to 3-5 normal value in PES and other hormones for the index).

A logistic curve was the best fitted to fresh weight data of carposporelings growing in aireated PES medium during three months (n=17).

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