

# *Kappaphycus alvarezii* (Rhodophyta, Areschougiaceae) cultivated in subtropical waters in Southern Brazil

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**Abstract** Four strains of *Kappaphycus alvarezii* were cultivated in the subtropical waters of Florianópolis, Santa Catarina State, Brazil (27°29'19" S/48°32'28" W), from February 2009 to February 2010. Seaweeds were cultivated

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on floating raft near of mussel farms. Salinity ranged from 29 to 36 psu and temperature from 17.1 to 28.5°C. Higher growth rates (5.12–4.29% day<sup>-1</sup>) were measured in summer and autumn, showing a positive correlation between growth rate and water temperature. Lower growth rates (0.54–0.32% day<sup>-1</sup>) occurred in winter, resulted mainly by biomass loss. Significant differences were observed among the strains in spring and the brown tetrasporophytic strain was the only one which failed to recover, being excluded of the experiments. The effect of cultivation periods (36, 42, and 97 days) on carrageenan yield, gel strength, and viscosity were analyzed. Carrageenan yields were higher for plants kept 42 days in the sea (28%), against 25% for 36 and 97 days. There were no significant differences in carrageenan yield among the strains analyzed. Viscosity increased with the increase of cultivation period, while gel strength seemed to vary at random. Tetrasporangia and cystocarps were not observed, and lost fragments did not attach outside the raft. In general, dissolved inorganic nitrogen concentration decreased around the cultivation area as compared to the mussel farm. Results show that cultivation of *K. alvarezii* is technically feasible in subtropical waters and can be associated with local mussel farms, mitigating the eutrophication and, eventually, increasing the economic return of the farmers.

**Keywords** Aquaculture · Brazil · Carrageenan ·  
*Kappaphycus alvarezii*

## Introduction

The production of *Kappaphycus alvarezii* (Rhodophyta, Areschougiaceae) in 2007 reached ca. 1,400 tonnes, yielding US \$132,000 (FAO FishStat Plus Database 2010). This