

Abiotic control of reattachment in *Gelidium chilense* (Montagne) Santelices & Montalva (Gelidiales; Rhodophyta)

B. Santelices, D. Varela

Abstract

Many of the agar-producing species of *Gelidium* and *Pterocladia* live on calcareous substrata in habitats with strong water movement. The thalli may suffer fragmentation by hydrodynamic drag but the vegetative fragments may reattach through differentiation of bundles of colorless, elongated rhizoids produced by inner and outer cortical cells. These rhizoids pass through intercellular spaces in the cortex, protrude outside the frond and cement the thallus fragments to the substratum. In *Gelidium chilense* (Montagne) Santelices & Montalva, differentiation and abundance of bundles of attachment cells are stimulated by the presence of calcareous substratum, minor additions (0.5 mM) of Ca^{2+} to the culture medium and by the highest photon flux density used ($50\text{--}90 \mu\text{E}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$). Photoperiod does not affect production of bundles of attachment cells. Reattachment time can be as short as 10 days under optimal culture conditions. The significant effects of calcium substratum and dissolved Ca^{2+} on the differentiation process of these attachment cells is consistent with the high number of reports describing species of *Gelidium* living associated with calcareous substratum.