



Ecological significance of deep-layer sloughing in the eulittoral zone coralline alga, *Sponites yendoi* (Foslie) Chamberlain (Corralinaceae, Rhodophyta) in South Africa.

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Abstract

The crustose coralline alga *Sponites yendoi* (Foslie) Chamberlain (Corallinaceae, Rhodophyta) dominates the lower eulittoral zone along the South Coast of South Africa, together with the limpet *Patella cochlear* Born. This coralline alga was previously shown to undergo a deep-layer sloughing twice a year, as well as continuous epithallial sloughing. The hypothesis that deep-layer sloughing could perform an antifouling function was tested by determining the percentage cover of fleshy algae developing in a limpet exclusion experiment on live and killed coralline. Substantial fleshy algal cover developed in both limpet removal treatments, negating any possible antifouling function of deep-layer sloughing. A measurable decrease in the mean thickness of the coralline population was noted during periods of sloughing. A thicker crustose coralline, *Leptophytum ferox* (Foslie) Chamberlain & Keats, grew more slowly and was much more heavily burrowed and more weakly attached than *S. yendoi*. These results are consistent with a hypothesis that deep-layer sloughing contributes to the alga's relatively thin thallus, thereby conferring the advantages of faster growth and stronger attachment. However, further studies are still needed to evaluate these hypotheses further.

1. Introduction

Encrusting coralline algae are important components of benthic marine communities within the euphotic zone throughout the marine realm (Adey & McIntyre, 1973; Dethier et al., 1991; Keats, 1986; Paine, 1984; Steneck et al., 1991). Some crustose coralline algae regularly slough an outer layer of cells (Masaki et al., 1981, 1984; Johnson & Mann, 1986; Keats et al., 1993). There are two types of cell sloughing in coralline algae: epithallial sloughing and deep-layer sloughing (Keats et al., 1993). Epithallial sloughing is probably common among corallines (Johnson & Mann, 1986; Masaki et al., 1981, 1984), but deep-layer sloughing has only been described for the South African littoral zone crustose coralline alga, *Sponites yendoi* (Foslie) Chamberlain (Keats et al., 1993).

Sponites yendoi is probably the most abundant coralline alga in the eulittoral zone along the southern coasts of South Africa (Chamberlain, 1993; Keats et al., 1993). It dominates the lower shore together with the gardening Limpet *Patella cochlear* Born. And has been

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