

Lithothamnion prolifer Foslie: A Common Non-geniculate Coralline Alga (Rhodophyta: Corallinaceae) from the Tropical and Subtropical Indo-Pacific

D. W. Keats^{a,*}, R. S. Steneck^b, R. A. Townsend^c and M. A. Borowitzka^c

^a Botany Department, University of the Western Cape, P. Pag X17, Bellville 7535, Rep. of South Africa

^b Department of Botany and Plant Pathology and Oceanography, Darling Marine Centre, University of Maine, Walpole, Maine 04573, U. S. A.

^c School of Biological and Environmental Sciences, Murdoch University, Murdoch, Western Australia 6150, Australia

* Corresponding author

A little-known, but ecologically important non-geniculate coralline, *Lithothamnion prolifer*, is recorded from a number of tropical Indo-Pacific sites, including Fiji, Australia, Kiribati and Indonesia. The species occurs primarily on vertical walls of caves and overhangs in Fiji and Australia, but was also found as rhodoliths in Kiribati. *Lithothamnion prolifer* is characterized by the combination of characters which follow. The thallus is extremely glossy, smooth, and rosy coloured. Thalli usually produce complanate protuberances, but protuberances become terete when growing on well lit, horizontal substrata, when unattached, or when growing on loose substrata. Conceptacles occur mainly on the tips of protuberances, and tetra/bisporangial conceptacles are large (to 1300 µm external diameter, with chambers up to 1100 µm diameter). The tetra/bisporangial conceptacles are flush or only slightly raised, and often extensive and irregularly shaped (resembling small sori). They lack a raised rim, and have flattened pore plates. The rosette cells surrounding the tetra/bisporangial pore appear somewhat sunken below the surrounding roof cells in SEM, and the cells of filaments lining the pore canals of tetra/bisporangial conceptacles do not differ from the cells of filaments making up the rest of the roof. Old conceptacles persist and become buried in the thallus, and are then usually completely filled in by irregularly arranged calcified cells.

Introduction

The non-geniculate coralline algae of the tropical Indo-Pacific region are poorly known at present, particularly as far as regional floras are concerned. For example, Chapman (1971) reported only 8 non-geniculate coralline species from Fiji. South and Kasahara (1992) recorded the 8 species reported by Chapman (1971) with an additional 4 species reported by Chapman (1977). None of these species have been studied in a modern context, and all must be treated as unconfirmed records. The only detailed studies of the non-geniculate coralline algae of any site in the tropical Indo-Pacific within the past 30 years were those of Gordon *et al.* (1976) who reported 15 species from Guam, Adey *et al.* (1982) who reported 27 species from Hawaii, and Verheij (1993 a, 1994) who reported 16 species from Indonesia. A study of the non-geniculate coralline algae of Fiji has therefore been undertaken by the first author to improve our knowledge of the taxonomy of the group in this region.

During the course of this study, a species of *Lithothamnion* was found that seemed concordant with *Lithothamnion prolifer* Foslie. It also conformed to specimens collected on the Great Barrier Reef, and which had been suspected of being a new species, but for which no description had been published. Speci-

mens of this species were also examined from Kiribati (coll. by G. Yeo), and Indonesia (coll. by E. Verheij). Therefore, this species was studied from material collected in Fiji, Kiribati, Indonesia, and the Great Barrier Reef.

Until recently, generic concepts for non-geniculate coralline algae were based on characters that have since been shown to be unstable or untenable (e. g. *Porolithon*, Penrose and Woelkerling 1988; *Fosliella*, Penrose and Chamberlain 1993). Recent studies by Woelkerling and co-workers have altered many of our generic concepts within this group, and have incorporated reproductive characters into the criteria used for generic delineation [e. g. May and Woelkerling (1988), Penrose (1992), Penrose and Chamberlain (1993), Penrose and Woelkerling (1988, 1992), Townsend *et al.* (1994), Woelkerling (1983, 1988), Woelkerling and Harvey (1993)]. As a result of these recent changes, it is often not possible to tell to which genus a particular species described in older literature belongs without reference to the type specimen. Ongoing studies in many parts of the world, however, are beginning to correct this situation [e. g. Chamberlain (1990, 1993, 1994), Chamberlain and Keats (1994), Chamberlain and Norris (1994 a, b), Keats and Chamberlain (1993, 1994 a, b, 1995), May and