Epithallus sloughing: a self-cleaning mechanism for coralline algae

An important ecological role of coralline algae on reefs (Littler and Littler 1997) is to inhibit the settlement and subsequent colonization of fleshy algae and other fouling organisms. Coralline algae represent one of only three red algal families (Corallinaceae, Sporolithaceae and Delesseriaceae) that possess intercalary cell division; as a result, they are able to shed apical cells either synchronously or diffusely. This results in the sloughing of upper epithallus cell layers, which reduces fouling processes (Johnson and Mann 1986, Littler and Littler 1997) in many crustose and articulated coralline algae. Because it occurs on a macroscopic scale, we frequently observe synchronous sloughing in such species as *Neogoniolithon fosliei* (Heydrich) Setchell & Mason and the concomitant detachment of large epiphyte loads [compare upper photo (showing loosened grey epithallus and attached epiphyte) with lower photo (after gently fanning); Great Astrolabe Reef, Fiji], suggesting the widespread importance of this phenomenon under natural conditions.

Acknowledgments We sincerely appreciate the field assistance of Barrett Brooks and Joan Koven. Funding was provided by MARPAT Foundation, the National Museum of Natural History Research Opportunities Fund and the Department of Botany, Smithsonian Institution. Smithsonian Marine Station Contr. No. 472 and Harbor Branch Oceanographic Institution Contr. No. 1277.

References

Johnson CR, Mann KH (1986) The crustose coralline alga, *Phymatolithon* foslie, inhibits the overgrowth of seaweeds without relying on herbivores. J Exp Mar Biol Ecol 96: 127–146

Littler MM, Littler DS (1997) Disease-induced mass mortality of crustose coralline algae on coral reefs provides rationale for the conservation of herbivorous fish stocks. Proc 8th Int Coral Reef Symp 1: 719–724

M. M. Littler
Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560, USA
D. S. Littler
Division of Marine Science, Harbor Branch Oceanographic Institution, 5600 U.S. 1 North, Fort Pierce, Florida 34946, USA