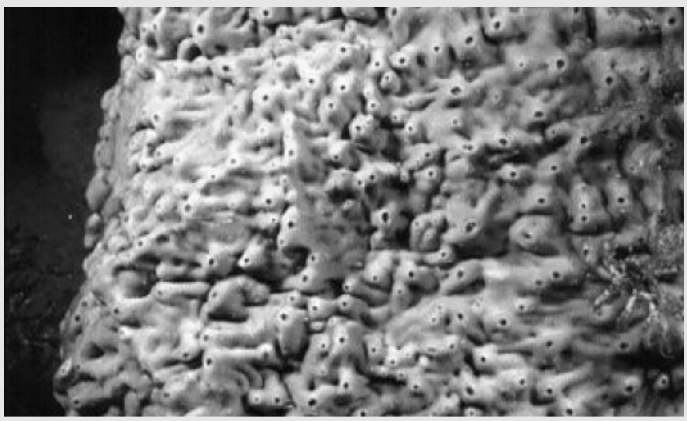

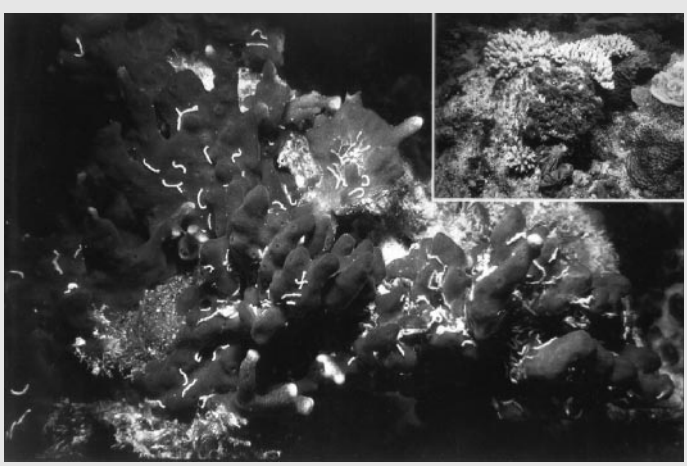

Sponge bleaching on the West and East coasts of Australia

At Fremantle (32°04'S, 115°45'E) on the West coast of Australia *Chondrilla australiensis* (Fig. 1), a dominant sponge forming encrustations up to 1 m^2, was found bleached in February 1998. Individuals in full light to 6 metres depth had lost all colouration, whilst shaded individuals and those below 6 metres had not bleached. After three months sponges that had completely bleached had died and shaded individuals were beginning to colonise substrata that had been cleared by the bleaching event.

At Heron Island (23°27'S, 151°55'E) on the East coast of Australia *Haliclona* sp. (Fig. 2), a dominant species in the channel zone between 10–15 m depth was found bleached in June 1998, and bleached individuals were still apparent in September 1998. Neither species had been observed to bleach prior to 1998 in 2 and 5 years of monthly monitoring respectively, and no bleaching has occurred since this event.

First indications are that sponge bleaching is associated with stress or loss of phototrophic symbionts within the sponges. *Chondrilla nucula* from the Northern Hemisphere contains the cyanobacteria *Aphanocapsa feldmannii* (Gaino et al, 1976). *Haliclona* sp. contains dinoflagellates (Garson et al, 1998), but bleached individuals had few dinoflagellates which were unhealthy in appearance and free-living rather than intracellular. The single previous account of sponge bleaching occurred in Puerto Rico in 1987–88 (Vicente, 1990).

The occurrence of sponge bleaching reported here coincides with hard and soft coral bleaching worldwide in 1998. The high latitude of the *Chondrilla* bleaching suggests that sessile invertebrates with phototrophic symbionts occurring in cooler regions are also influenced by recent climatic anomalies, with implications for management of reef environments. Changes in symbiont levels are likely to impact on the secondary chemistry of the sponge species and hence on their ability to survive in competitive reef environments, thus altering present community structure. We have experimental evidence that the alkaloids from *Haliclona* sp. inhibit larval settlement, are toxic to corals, and deter reef fish from feeding on the sponge tissue.

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