The "Black Disease" of Reef-Building Corals at Green Island, Taiwan – Outbreak of a Cyanobacteriosponge, *Terpios hoshinota* (Suberitidae; Hadromerida)

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Sponges are important space competitors on coral reefs and are able to overgrow living corals. While conducting ReefCheck 2006 at Green I. (*Lyudao* in Chinese), off the southeastern coast of Taiwan, a large area of scleractinian corals was observed to have been overgrown by the blackish encrusting cyanobacteriosponge, *Terpios hoshinota* (Fig. 1) at Chaikou (22°51.66'N; 121°48.83'E).

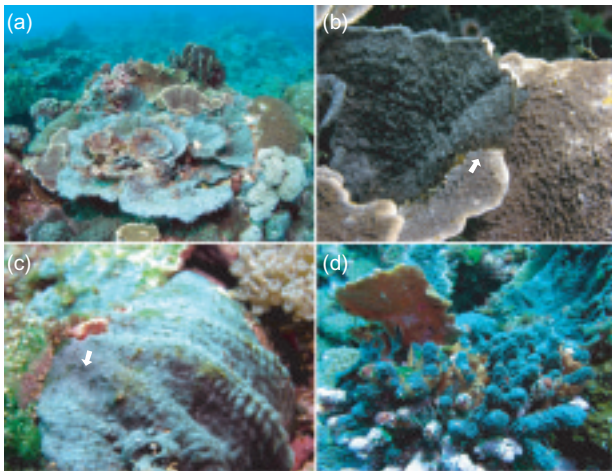

Fig. 1. View of the cyanobacteriosponge, *Terpios hoshinota*, *in situ* at Chaikou, Green I., Taiwan. (a) *Montipora efflorescens* overgrown by *T. hoshinota*; (b) edge of the sponge showing the extended short fine tendrils (arrow) which are used to invade the coral victim; (c) close-up showing the surface structure of the astrorhizae and osculum of the sponge (arrow); (d) an *Acropora humilis* colony completed destroyed by *T. hoshinota*.

Terpios hoshinota is distinguished by lobed tyostyle spicules and is associated with the highly abundant cyanobacteria of the *Aphanocaps raspaigella* type (Rützler and Muzik 1993). An outbreak of *T. hoshinota* is reported to be a "black disease" that kills and overgrows live corals and is responsible for the demise of large reef areas in the Ryukyus (Japan) and Guam in the last century (Bryan 1973, Plucer-Rosario 1987, Rützler and Muzik 1993). Black disease was not reported in ReefChecks between 1998 and 2004 at Chaikou (Dai et al. 2005). However in 2006, 30% of the coral was overgrown by *T. hoshinota* along a 100 m transect belt. This accounted for 12% loss of average coral coverage compared to that of ReefCheck 2005 at Chaikou and suggests that the outbreak of black disease in Chaikou had developed within 1 yr. Once the black disease has developed, it can last for over a decade occupying the substrates and preventing the recruitment of juvenile corals (Bryan 1973). Despite the pathogenesis and the pathological role of *Terpios*-symbiotic cyanobacteria remaining unclear, the negative impacts of fast-growing and long-lasting symptoms highlight that any *T. hoshinota* outbreak should be viewed as a disease threat to corals and could possibly one of the most important disturbances affecting reefs in the Pacific. http://zoolstud.sinica.edu.tw/Journals/46.4/520.pdf

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