

# Coral-killing cyanobacteriosponge (*Terpios hoshinota*) on the Great Barrier Reef

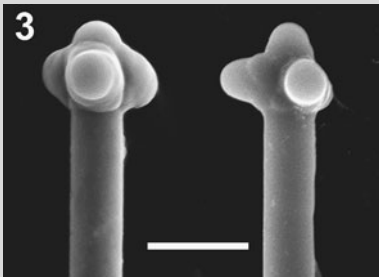
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**Fig. 1** *Acropora* colony with *T. hoshinota* at the lagoon of Lizard Island (14°41'52.87" S, 145°27'13.87" E)



**Fig. 2** Close up of the sponge overgrowing live *Acropora*



**Fig. 3** Spicule heads of *T. hoshinota* observed under scanning electron microscope. Scale = 5  $\mu$ m

The encrusting cyanobacteriosponge *Terpios hoshinota* was originally described from Guam (Rützler and Muzik 1993) and is expanding its range in coral reefs of the northwestern Pacific (Liao et al. 2007). *Terpios hoshinota* encrusts many hard substrates, including live coral, and occasionally undergoes massive outbreaks that can cover huge areas, which can result in the mass mortality of corals and other resident organisms (Bryan 1973; Rützler and Muzik 1993). This sponge presents a potentially serious threat to coral reefs, and data are needed on its current distribution and abundance to assess its geographical expansion.

In September 2010, sponges resembling *T. hoshinota* were found on the coral reef of Lizard Island, Australia, growing over live *Acropora* corals (Figs. 1, 2). Upon preservation in ethanol, the solvent turned green, indicating the presence of cyanobacteria. Further examinations utilizing both internal transcribed spacer 1 (ITS-1) ribosomal DNA sequences (data not shown) and light and electron microscopy (Fig. 3) to examine spicules confirmed the identity of this sponge as *T. hoshinota*. This is the first record of *T. hoshinota* from the Great Barrier Reef and indicates that this potentially destructive species may be expanding its range into the south-eastern Pacific, or has gone undetected until now. *Terpios hoshinota* distribution in the Great Barrier Reef and central Indo-Pacific should be investigated to assess risks posed by this species to the highly diverse coral reefs in these regions.

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## References

- Bryan P (1973) Growth rate, toxicity, and distribution of the encrusting sponge, *Terpios* sp. (Hadromerida: Suberitidae) in Guam, Mariana Islands. *Micronesica* 9:237–242
- Liao M, Tang S, Hsu C, Wen K, Chen W, Wang J, Meng P, Twan W, Lu C, Dai C, Soong K, Chen C (2007) The “black disease” of reef-building corals at Green Island, Taiwan—outbreak of a cyanobacteriosponge, *Terpios hoshinota* (Suberitidae: Hadromerida). *Zool Stud* 46:520
- Rützler K, Muzik K (1993) *Terpios hoshinota*, a new cyanobacteriosponge threatening Pacific reefs. *Sci Mar* 57:395–403

T. Fujii · E. Hirose  
Department of Engineering and Science, Faculty of Science, University of the Ryukyus,  
1 Senbaru, Nishihara, Okinawa 903-0213, Japan

S. Keshavmurthy · C. A. Chen  
Biodiversity Research Center, Academia Sinica, Nangang, Taipei 115, Taiwan

W. Zhou  
Institute of Marine Biology, National Sun Yat-sen University, Kaohsiung 804, Taiwan

C. A. Chen  
ARC Centre of Excellence for Coral Reef Studies, James Cook University,  
Townsville 4810, Australia

J. D. Reimer (✉)  
Rising Star Program, University of the Ryukyus, 1 Senbaru, Nishihara, Okinawa 903-0213,  
Japan  
e-mail: jreimer@sci.u-ryukyu.ac.jp

# Reef sites

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