


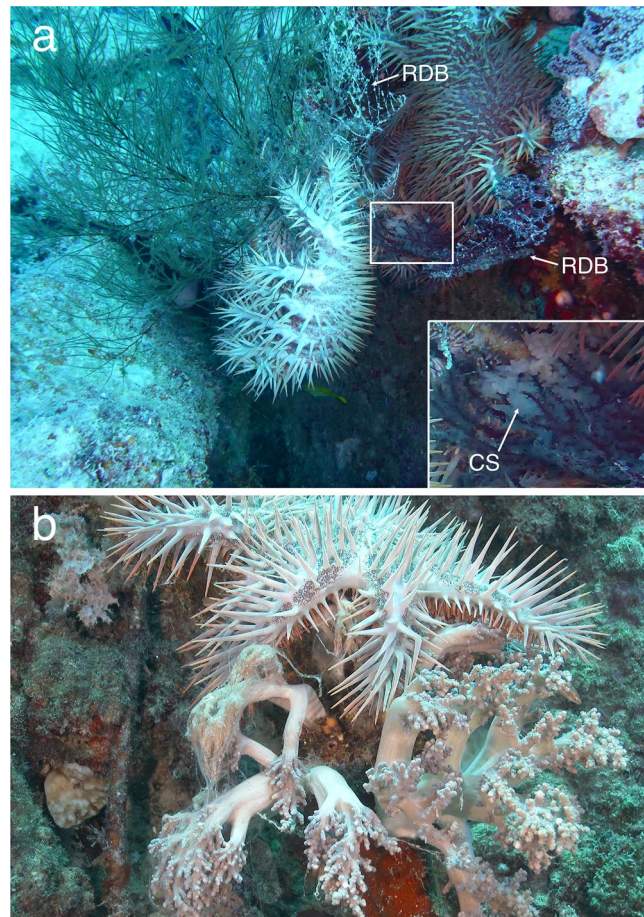


What is for dessert? Crown-of-thorns starfish feeds on non-scleractinian anthozoans at Taiping Island (Itu Aba), Spratlys, South China Sea

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Fig. 1 **a** CoTS feeding on corals *Dendronephthya* and *Antipathes* by everting the cardiac stomach (CS) out (small panel). RDB indicates recently dead coral branches; **b** CoTS and mucus-covered *Litophyton* nearby



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Crown-of-thorns starfish (CoTS), *Acanthaster cf. solaris*, are notorious coral-killing benthic invertebrates with the ability to consume extensive areas of scleractinian coral during their population outbreaks (Pratchett et al. 2014). Studies have shown that adult CoTS show strong feeding preferences for scleractinians (summary in Birkeland and Lucas 1990). CoTS are also likely feeding on other anthozoans such as soft corals and sponges where available scleractinians are low in abundance (Chesher 1969; Birkeland and Lucas 1990). Studies providing empirical evidence of the feeding behavior of CoTS remain rare.

On April 8, 2021, we observed a significant decline of corals, from 33 to 0.9% between 2017 and 2021, in conjunction with a CoTS outbreak at Taiping Island (Itu Aba) (10° 22' 35" N, 114° 21' 55" E), Spratlys, in the central South China Sea (Heng et al. 2021). The observed migration of CoTS from shallow reefs (up to 14 m in depth) to the deeper sandy bottom resulted in a rapid decline in CoTS density on shallow reefs from 0.06 to 0.003 indiv. m⁻² over 4 weeks. This indicated the terminal stage of the outbreak. With less scleractinian corals available, several remaining CoTS individuals were observed smothering colonies of non-scleractinian anthozoans growing on a shipwreck sunken at the sandy bottom between 16 and 35 m in depth next to the reef (Fig. 1, supplementary video). CoTS were feeding on *Dendronephthya* and *Antipathes* by everting their cardiac stomach over live coral polyps (Fig. 1a, supplementary video). The recently dead branches (RDB) of *Dendronephthya* and *Antipathes* (Fig. 1a) and mucus-covered *Litophyton* (Fig. 1b) found nearby CoTS suggested that CoTS were also feeding on them. This is direct evidence of CoTS feeding on non-scleractinian anthozoans at the terminal stage of the outbreak when the coral cover is low. Our finding calls for further research into the frequencies and mechanisms of CoTS feeding on non-scleractinian anthozoans and their impact on tropical coral reefs.

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Declarations

Conflict of interest The authors declare no competing interests.

Ethical approval No animal testing was performed during this study.

Sampling and field studies All necessary permits for accessing the study site and conducting observational field studies have been obtained by the authors from the competent authorities and are mentioned in the "Acknowledgements" section.

Data availability Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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