

## Crown-of-thorns Outbreak at the Tubbataha Reefs UNESCO World Heritage Site

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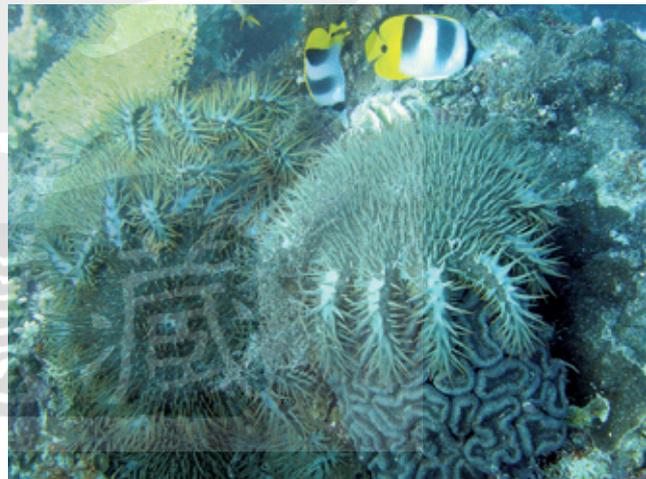
In June 2009, some locations within the Tubbataha reefs, located in the center of the Philippine's Sulu Sea, were infested with crown-of-thorns sea stars (*Acanthaster planci*). The Tubbataha reefs, which consist of 2 atolls, were declared a UNESCO World Heritage Site in 1993, due to their high biodiversity and global ecological importance.

High numbers of crown-of-thorns sea stars in combination with numerous recently bleached corals were observed at the southeastern fringe of the North Atoll (Fig. 1). Other locations, including the South Atoll, were also affected. Sea stars were observed to be intraspecifically competing for coral resources, which is an indication of the high densities in which they occurred (Fig. 2).

The remoteness (about 155 km to the nearest human settlements) and the pristine conditions of the Tubbataha reefs seem to preclude overfishing of predators as an explanation for this crown-of-thorns outbreak (Uthicke et al. 2009), e.g., puffer- and triggerfish, preying on juvenile crown-of-thorns, were abundant. In contrast, the gastropod triton's trumpet (*Charonia tritonis*) and polyps of *Pseudocorynactis* sp. (Bos et al. 2008) were not observed in June 2009, but these may only occur in relatively low densities. Other direct human activities do not seem to explain this recent outbreak either. It could rather be the result of a massive influx of new recruits (Pratchett 2005) supported by eutrophication, an indirect effect of human activity. Calculating from the size of the sea stars (the majority had a diameter of 25-35 cm), the influx must have occurred 2-3 yr ago (Pratchett 2005). Whatever the exact cause of this recent crown-of-thorns outbreak is, immediate action is needed to avoid further damage which could jeopardize the ecological functioning of this World Heritage Site. <http://zoolstud.sinica.edu.tw/Journals/49.1/124.pdf>



**Fig. 1.** Numerous dead corals at 18 m in depth at Amos Rock (North Atoll).



**Fig. 2.** Intraspecific competition between crown-of-thorns sea stars (up to 8 individuals per coral colony were observed).

### REFERENCES

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