High germline mutation rates, but not extreme population outbreaks, influence genetic diversity in a keystone coral predator

Iva Popovic, Lucie A. Bergeron, Yves-Marie Bozec, Ann-Marie Waldvogel, Samantha M. Howitt, Katarina Damjanovic, Frances Patel, Maria G. Cabrera, Gert Wörheide, Sven Uthicke, Cynthia Riginos

Close up of an adult crown-of-thorns sea star, Acanthaster cf. solaris, on Porites coral on the Great Barrier Reef, Australia. Corallivorous crown-of-thorns sea stars are among the most influential keystone predators in tropical coral reef ecosystems. Adult populations undergo extreme population size fluctuations or outbreaks and can decimate coral reefs. Whole-genome sequencing of parent-offspring trios in this species revealed unexpectedly high mutation rates and reduced effective population size, despite population abundance exceeding 20-90 million individuals. Such fundamental knowledge advances our understanding of mutation rate evolution and how genetic diversity is maintained in large marine populations.

Image credit: Sven Uthicke