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First observation of cushion seastar *Culcita* sp. spawning simultaneously with other Echinoderms species in Central Indian Ocean

Enrico MONTALBETTI^{1,2*}, Sara VENCATO^{1,2}, Luca SAPONARI¹, and Davide SEVESO^{1,2}

¹ MaRHE Center, Magoodhoo, Faafu Atoll, Republic of Maldives.

² University of Milano-Bicocca – Department of Earth and Environmental Sciences (DISAT)

* Corresponding author: E. Montalbetti

E-mail: enrico.montalbetti@unimib.it

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Culcita spp. are facultative corallivores occurring throughout the Indo-Pacific Ocean. In the Maldives, *C. schmideliana* (Bruzellius, 1805) was reported as one of the main contributors to a delay in coral recovery after the 2016 bleaching event and the resulting coral mortality, due to the large densities of specimens recorded and their preferential predation on coral recruits (Bruckner and Coward 2019). To date, little information is available on the timing and controlling factors of the reproductive cycle of the seastar, with only few reports of spawning in the wild (Otha et al. 2011).

On the 7th of March 2020, spawning by *Culcita* sp. and several other echinoderms was observed on the shallow reef (< 8 m) adjacent the island of Thudufushi, South Ari Atoll, Republic of Maldives. The spawning took place at 1730 hrs following the peak of low tide (1715 hrs), two days before the full moon. Fifteen individuals of *Culcita* sp. (Fig. 1a, b, c), 3 *Linckia multifora* (Lamarck, 1816) (Fig. 1d), 2 *Fromia indica* (Perrier, 1869) (Fig. 1e) and 1 *Pearsonothuria graeffei* (Semper, 1868) (Echinodermata: Holothuroidea) were observed showing spawning behaviour such as an arched body shape or releasing sperm from the gonopores within an estimated area of 200 m². The event took place in the same tide and lunar cycle conditions of previous unreported events recorded in Faafu Atoll in April 2019 (Personal observation), suggesting that the period of March- April could coincide with a spawning season of *Culcita* sp. Interestingly, the butterfly fish *Chaetodon falcula* (Bloch, 1975) was observed feeding on recently released *Culcita* sp. sperm (Fig. 1c).

Culcita spp. are known to feed on coral recruits (Montalbetti et al. 2019) and together with *Drupella* spp. and *Acanthaster planci* (Linnaeus, 1758) are recognized as a potential threat for Maldivian coral reefs (Saponari et al. 2018). This observation represents the first record of natural spawning for this genus in the Republic of Maldives as well as in Central Indian Ocean, and it may contribute to an increased understanding of the reproductive cycle for *Culcita* spp. in this area.

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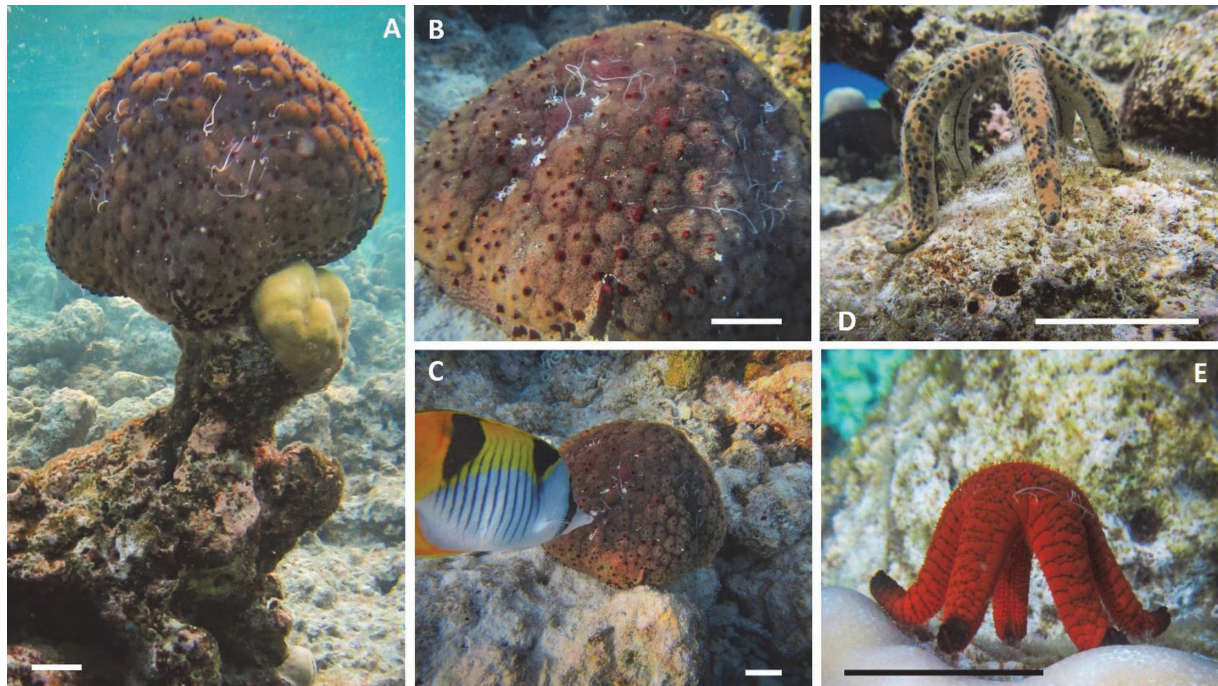


Fig. 1 A *Culcita* sp. showing arched body shape while spawning B Close-up of seastar aboral surface with the release of gametes C *Chaetodon falcata* feeding on *Culcita* sp. gametes. D *Linckia multifora* with an arched body shape characteristic of spawning E *Fromia indica* with an arched body shape position releasing gametes (scale bars: 5 cm)

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