ISSN 3051-4657
Proceedings of the 02nd Symposium on Ocean and Freshwater Systems (SOFS) – 2024
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Reproductive periodicity of the sea urchin *Tripneustes gratilla* (Linnaeus, 1758) in Ahangama rocky reef, Sri Lanka

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Abstract

Sea urchins are ecologically, and economically important species distributed in many shallow marine benthic habitats. Among edible sea urchins, *Tripneustes gratilla* is abundant and crucial for controlling macroalgae on Sri Lankan coastal reefs. This study focused on the reproduction periodicity of *T gratilla* in the Ahangama Reef, Sri Lanka. Monthly samples (approx. 24) of sea urchins were collected from February to October 2023. Samples were dissected to extract gonads. The Ganado somatic index (GSI (%)) was calculated and histological examinations of gonads were carried out. *T gratilla* at Ahangama Reef exhibits continuous asynchronous reproduction with peak spawning periods in April, August, and September. Male and female reproductive cycles were synchronized. The highest mean GSI (%) values in April (male: 5.769 ± 0.581%, female: 5.022 ± 0.535%) suggests the maturation of the majority of urchins in this population, and the subsequent decline in mean GSI (%) in May (male: 2.729 ± 0.581%, female: 1.847 ± 0.535%) reflects the spawning. Gametogenesis consists of five gametogenic stages; growing, premature, mature, spent, and recovering. All stages of gametogenesis were present every month throughout the study period, indicating the continuous reproduction of *T gratilla* population at Ahangama rocky reef. Peak GSI (%) of males in April coincided with the highest mature stage frequency (36.36%). Similarly, The sudden drop in GSI (%) in May coincided with the high spent and recovering stage frequencies of both males (spent – 27.27%, recovering - 36.36%) and females (spent - 38.46%, recovering - 61.54%) which indicate the accumulation of nutritive phagocytes immediately after spawning. Both GSI % values and histological evidence revealed that *T gratilla* has a continuous asynchronous reproductive cycle, with the majority of the *T gratilla* population at Ahangama rocky reef spawning in April which is the first inter-monsoon period in Sri Lanka.

Keywords

Sea urchin, gametogenesis, percentage gonadosomatic index