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First Records of Coral Killing Cyanobacteriosponge *Terpios hoshinota* within the Marine Sensitive Reef Ecosystem in Pasikuda Bay, East Coast of Sri Lanka

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Abstract

Coral reefs are a crucial ecosystem supporting marine biodiversity, yet they are increasingly threatened by various anthropogenic, biotic and abiotic factors. Among these, the coral-killing cyanobacteriosponge *Terpios hoshinota* has emerged as a significant concern due to its ability to overgrow and cover live coral colonies. This study records the first confirmed occurrence of *T. hoshinota* in multiple locations within Pasikuda Bay - east coast of Sri Lanka contributing to new data on its geographical range. Field reef assessment survey conducted during 01st to 06th October 2024 in Pasikuda identified several patches of this sponge overgrowing healthy coral species, particularly *Acropora*, *Porites* and *Montipora*. Infestation extent was assessed with opportunistic observation sampling conducted, indicating that approximately 0.2% of coral cover in a 30m X 100m belt is covered by *T. hoshinota*. The presence of *T. hoshinota* poses an additional threat to these already vulnerable coral communities, which are subject to climate change/ bleaching events, and localized anthropogenic stressors. Within reef sections, older infestations of the sponge showed signs of natural suppression by reef associating algal growth. This suggests that ecosystem dynamics are suppressing the overdominance to a certain extent managing the invasion of the sponge. Increased turbidity within the off season, might be suppressing the spread of *T. hoshinota*. Reliance on light for photosynthesis has been utilized in pilot studies in several tropical countries, where the invasion has been controlled preventing the photosynthesis. Two 2cm *T. hoshinota* infested coral fragments were placed in a sea water filled container and introduced to pharmaceutical grade hydrogen peroxide and chlorine (used for pool water treatment) to observe the reactivity. Both the chemicals showed positive signs of sponge killing properties in controlled conditions even applied in low concentration. Further studies are required to assess the sponge's distribution, seasonality, and its impact on healthy reef ecosystems in order to evaluate if chemical treatment is necessary to control the invasion. Further research will reveal seasonal dynamics, distribution, and ecological impact of this sponge, as well as to assess the feasibility of chemical interventions for larger-scale management. Continuous monitoring and regional assessments might be necessary in addressing emerging marine threats to biodiversity including *T. hoshinota* within the region or even on a country level. The assessment was conducted as a part of marine special mapping of Pasikuda Bay with the assistance from Browns Hotels and Resorts in collaboration with USAID Sri Lanka.

Keywords: *Terpios hoshinota*, *Cyanobacteriosponge*, *Coral reef degradation*, *Marine ecosystems*