

Original Article

Evaluation of the fisheries and resource of sea cucumbers in the coastal waters of Trincomalee district, Eastern Sri Lanka

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Abstract: Though sea cucumber is one of the key export-oriented fishery resources in Sri Lanka, there is some evidence for the population depletion of most of the sea cucumber species in the shallow coastal waters. The present study was aimed to study the status of the sea cucumber fishery in the Irrakkakandi coastal area, eastern Sri Lanka, and carry out a stock assessment on the critical sea cucumber species presently harvested in this area. In order to achieve the objectives, logbook records based survey was conducted to cover the fishing season in 2019, from late February to the end of September. The harvest was collected by skin diving from shallow nearshore waters and Scuba diving from distal coastal waters about 5 km away from the shore. *Thelenota anax* was the dominant species in the catch from both fishing grounds, with a relative abundance of 86.82% in shallow waters and 91.30% in distal waters. The average Catch Per Unit Effort (CPUE) during the fishing season in 2019 for SCUBA diving and skin diving was 50 ± 8.59 individuals /boat/day and 8 ± 1.12 individuals /diver/day, respectively. The dominant stock of the *T. anax* in the distal fishing ground was assessed using the depletion method. The initial stock size of *T. anax* at the onset of the fishing season was estimated at 112,067 individuals, and about 25% of the initial stock had been fished by the end of the fishing season in 2019. The estimated catchability coefficient (q) was 0.00046. The study revealed that the stock of *T. anax* along with other recorded threatened species in the Irrakkakandi coastal waters might be led towards extinction if the fishery prevails without proper management.

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Introduction

Sri Lanka is an island nation located in between $5^{\circ}55'$ and $9^{\circ}55'N$ and $72^{\circ}42'$ and $81^{\circ}52'E$, south of the Indian subcontinent. It has a total land area of 65,000 km² and a coastline of 1,770 km in length, containing several bays and shallow inlets (Kumara et al., 2005; Dissanayake et al., 2010). The continental shelf area is 30,000 km², which is relatively narrow and small in the area when compared with other island nations (Kumara et al., 2005). Fishing activities are carried out all around the coast, but primarily within the continental shelf, which rarely extends more than 40 km and averages 25 km (Dissanayake et al., 2010).

Though there are nearly 200 known species of sea cucumbers found in the waters around Sri Lanka, about 75 species inhabit shallow coastal waters, while nearly 50 species are abundant in intertidal areas (Kumara et al., 2005). Among them, 21 species are

considered commercially important (Dissanayake and Athukoorala, 2010; Dissanayake and Stefanson, 2010). As in many Asian countries, the sea cucumber fishery in Sri Lanka is an artisanal fishery confined to the shallow coastal waters (Dissanayake et al., 2010; Dissanayake and Stefanson, 2012). At the present, the sea cucumber fishery is confined to the north-western (Puttlam and Mannar districts), eastern (Trincomalee to Ampara districts), northern (Jaffna district) and north-eastern (Mullaitivu district) coastal areas of the island. Sea cucumbers were initially harvested by hand picking along the coast during the low tide period, and since the 1980's fishers moved further offshore using snorkelling and at present by scuba diving as stock became depleted in shallow waters (Kumara et al., 2005). Fishing activities for sea cucumbers in Sri Lanka are highly seasonal which affected by the monsoon wind patterns. Generally, the

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