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## Ghost gear retrieval attempts from Enayam coast of Tamil Nadu

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Accidental loss of fishing gear during fishing operations is not a new phenomenon. As per FAO (Macfaden et al., 2009) 10% of all fishing gear operated around the world is lost in the sea. It has become a problem of severe concern as it adversely affects the ecosystem. The menace has assumed gigantic proportions in recent times due to a change in the material used for fabrication of gear since 1950s and the unusual increase in the volume of gear used per unit vessel. Replacement of natural fibers by synthetic fibers paved way for the lost gear becoming a threat to biodiversity.

Besides the accidental loss, forced abandonment and purposeful discarding of gear add to the quantum of lost gear in water bodies. The low quality of netting material used for fabrication of gears result in easy breakage of nets at sea with irresponsible handling of gear by fishers adding to the gravity of the problem. The lost gears are collectively termed as 'ALDFG', viz., the abandoned, lost or otherwise discarded fishing gear.

ALDFG being plastic in origin, initially float on the sea surface drifting along with waves and ghost-fish until the fishing power of the netting is intact. Besides, ALDFG entangle non target

organisms including endangered animals such as turtles, cetaceans, birds etc. The problem of ALDFG and ghost fishing was first brought to the notice of the world during the 1970's (High, 1976; Pecci et al., 1978). Of late, it has become a serious problem, gaining much international attention. Retrieval of lost gear from the sea bottom; locating lost gear through under water survey using side-scan scanner and scuba divers; assessing the rate of gear loss by interviewing fishers; assessing the catch rate of lost gear and mitigation measures are areas where research is currently being carried out in different parts of the world.

India has 174 000 units of fishing gear in operation, of which 154 008 are gillnets / drift nets and 7 285 are traps (CMFRI, 2012). Gill nets and traps once lost, will continue to ghost-fish effectively for a substantial period of time. Research in the area of ALDFG and ghost fishing from Indian waters is in its infancy. Focused research on ghost fishing was initiated by ICAR-CIFT, Kochi in 2018 for the first time in the country. These research efforts have led to gear retrieval attempts at Enayam coast of Tamil Nadu during March 2019. About 33 kg of ghost gear were retrieved by scanning an area of 700 m<sup>2</sup> sea bottom (8° 12.886'N , 77° 10.874'E, depth 12-18 m) with the help of scuba divers from locations identified through information collected from local fishers. Seven types of lost gears were retrieved with gillnet being the most common of them. The lost gears recovered were polyamide (PA) monofilament gillnet panels (Fig. 1) (47.5 m<sup>2</sup>), pieces of trawl codends (2.8 m<sup>2</sup>), PA monofilament long line (15.6 m), polypropylene rope (8.3 m), damaged traps (Fish and lobster trap) (Fig. 2), and squid jigs (3nos).

The condition of the retrieved gear showed that the gear had been lost in the sea for more than a year as evident from the growth of algae, mussels and other sedentary organisms attached on the surface. In none of the retrieved gear remnants of fish or shell fish were observed. The extent

of lost gear retrieved from the area surveyed showed that the problem of ALDFG in Indian waters is grave. Therefore, focused studies are required to assess the severity of the problem and to develop mitigation measures.



*Fig.1 Retrieved gillnet panel from the sea at Enayam, Tamil Nadu*



*Fig.2 Retrieved lost trap form the sea at Enayam, Tamil Nadu*

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## Jelly fish- A problem to possibility

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Jellyfish is a marine invertebrate belonging to the class Scyphozoa under phylum Cnidaria. An adult jellyfish is having a bell shaped body, enclosed by a jelly like matter where its internal structures are encompassed. The manubrium (tentacles) are hanging from this mass. Some jellyfish tentacles are present with stinging cells that have poisonous substance which kills or stuns other animals whereby they capture the prey or protect themselves from enemies.

Jellyfish catch increasing tremendously in the marine environment and is said to create nuisance to the fishermen and to the marine environment. The swarms of jellyfish are a constant threat to fisheries and marine food chain. Some jellyfishes are reported to have toxin which makes it an inedible product. However, some species of jellyfish are identified as edible and are widely consumed in Asian countries like China, Japan, Malaysia, Taiwan, Singapore and Korea (Hsieh et al. 2001). Reports are there suggesting the utilization of jellyfish not only for consumption but also for generating high value products.

Jelly fish swarms are reported to cover vast area in the ocean, which causes destruction to the vessels, boats and fishing gear. In India, especially in South Indian coast, it was noticed that jellyfishes are available during the post monsoon season. In spite of the huge production, a little is known about the composition and utilisation of jelly fishes. Hence, an attempt was made in ana-

lysing the nutritional composition so as to enable the utilization of jellyfish that are available from Indian coast.

In this study, Jellyfish (Fig. 1) was collected from Cochin waters and bought to the laboratory in chilled condition. As soon as it reached the laboratory, a thorough washing was given in ice cold potable water. The cleaned sample was cut into small pieces and then subjected to nutritional analysis of the meat (umbrella and manubrium) and fluid separately. Moisture, protein, fat, ash and carbohydrates were analysed according to AOAC method (AOAC, 2016).

The proximate composition of jelly fish (meat and fluid) is given in table 1. The protein content of meat portion was higher than the jelly fish fluid analysed. The protein content of meat studied is similar to *Aurelia aurita* with 2.1% protein (Spitz et al., 2010) and is higher than cannonball jelly fish with 1.07% (Huang et al. 1988). The lower amounts of carbohydrate and fat content creates its potential for low caloric food. It has also been accepted as a prime delicacy in many parts of the world. The presence of collagen and mineral content along with low calorie value make jellyfish a candidate species for developing nutraceuticals, functional food and nutricosmetics. Further studies are required in processing and product development aspects so as to enable the development of high quality products from the jelly fish studied.