

Status of eel fishery along the Odisha coast

Swatipriyanka Sen¹, Madhumita Das¹, ¹Menaka Das, Gyanaranjan Dash¹, Rajesh Kumar Pradhan¹, Biswajit Dash¹ and Shubhadeep Ghosh²

¹ Field Centre of ICAR-Central Marine Fisheries Research Institute, Puri-752 002, Odisha

² Visakhapatnam Regional Centre of ICAR-Central Marine Fisheries Research Institute, Visakhapatnam-530 003, Andhra Pradesh

*e-mail: swatipriyank1a@gmail.com

Abstract

Estimated landings of eels along the Odisha coast during 2007- 2021 ranged from 561 to 5194 tonnes. In 2021, the total eel landings of 1752 tonnes contributed 1.7 % to the total marine fish catch of the state. Multiday trawlers were the major crafts operated for eel resources with highest landings observed during October-December (47.7%) along the Odisha coast. Six species regularly landed during the period were *Anguilla bicolor*, *Muraenesox bagio*, *Muraenesox cinereus*, *Congresox talabon*, *Congresox talabonoides* and *Strophidon sathete* with rare landings of *Gymnothorax* sp. and *Congresox* sp. also recorded. During 2007- 2021, *M. cinereus* (36 %), *M. bagio* (35%), followed by *A. bicolor* (21%), *Congresox* sp. (3%), *C. talabonoides* (3%), *C. talabon* (1%) and *S. sathete* (1%) dominated amongst the eel species landed during all the years. *M. bagio* followed by *S. sathete* were the dominant and targeted species landed at Puri during 2021. The length range for *M. bagio* and *S. sathete* were 95-190 cm and 60-240 cm respectively. The market price is ₹300-350 for *M. bagio* whereas *S. sathete* which comes as bycatch is sold at ₹50-60 per kg in fresh condition.

Keywords: east coast, airbladder, sustainability, resource, slender giant moray

Introduction

Eels belong to the order Anguilliformes comprising of eight suborders of which, Congroidei is the most diverse one having 5 families, 97 genera, and 498 species (McCosker, 2010). Eels are a delicacy food in many countries like China, Japan, Malaysia, Russia, United States and Ukraine and form targeted fisheries of many countries including India, for the high market demand of airbladders. India exports the airbladders of eels to Hong Kong, China, Singapore, Thailand, United Arab Emirates, United States, United Kingdom and Canada. Apart from that, eels are exported as live, dried eel's maws, live aquarium fish, frozen fish to China, Hong Kong, Germany, Vietnam, United States, and United Kingdom from India.

In India, eels are generally prevalent in the southwest

coast of Gujarat and Maharashtra and to some extent in the northeastern states of Odisha and Andhra Pradesh (Menon *et al.*, 1998). The estimates of landings of eels accessed from the National Marine Fishery Resources Data Centre (NMFDC) of the ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI) showed Karnataka was the top most state in eel landings (4667 tonnes) followed by Andhra Pradesh (2415 tonnes) and Gujarat (2064 tonnes) during 2021 (Fig. 1).

The all India landings of eels were estimated at 15047 tonnes from which the landings of Odisha were 1751 tonnes contributing 8.6% to the all India eel landings. Till date 30 species of eels are known to occur along the Odisha coast. Eels reported to be landed in large quantities along Odisha coast are *Anguilla bicolor* (Indonesian shortfin eel), *Muraenesox bagio* (Common pike conger), *Muraenesox cinereus* (Dagger tooth pike conger), *Congresox talabon*

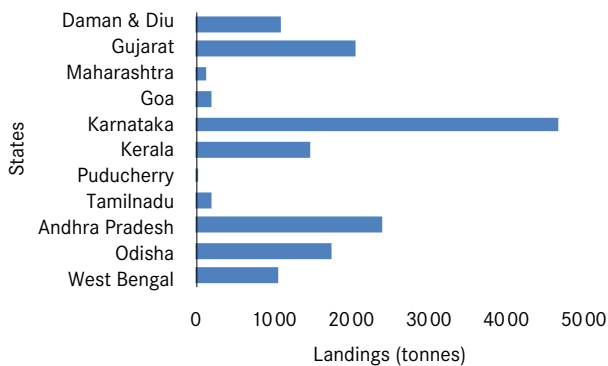


Fig. 1. State- wise landings of eels across India during 2021

(Yellow pike conger), *Congresox talabonoides* (Indian pike conger), *Strophidon sathete* (Slender giant moray) and rare landings of *Congresox* sp. and *Gymnothorax* sp. New species of eel recorded from Odisha are small eye snake eel *Allips concolor* and dark-shouldered snake eel *Ophichthus cephalozona* (Mohanty *et al.*, 2020, 2021) and short brown moray eel *Gymnothorax odishi* sp. nov (Mohapatra *et al.*, 2018).

Eels contribute significantly to the total demersal landings of Odisha and constitute a targeted fishery in multiday trawl nets, longlines and some other gears. The landings of eels in six different maritime districts i.e., Ganjam, Puri, Jagatshingpur, Kenrapada, Bhadrak and Balasore contribute significantly to the total landings of the state.

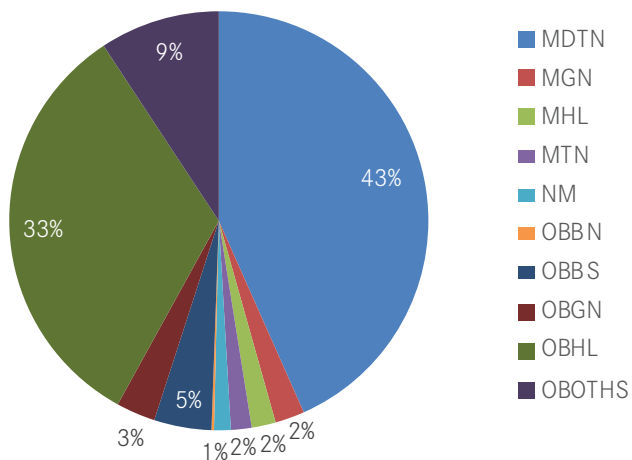


Fig. 2. Gear-wise landings of eels along Odisha coast during 2007-2021(MDTN: mechanized multiday trawl nets, MGN: mechanized gillnets, MHL: mechanized hooks and lines, MTN: mechanized single-day trawl nets, NM: Non-mechanized, OBBN: outerboard bagnet, OBBS: outerboard fiberglass bottomset gill nets, OBGN: outerboard gillnets, OBHL: outerboard hooks and lines, OBOTHS: outerboard other units)

The major crafts and gears chiefly employed in eel harvest during 2007- 2021 period in Odisha waters were multiday trawlers (43 %), outboard hook and line (33 %), out board other units (9%), outboard fiberglass bottomset gill nets (5 %), outboard gillnetter (3%), mechanized hook and line (2%) and others (5%) (Fig. 2). During 2007- 2021, *Muraenesox cinereus* (36 %) dominated amongst the eel species landed followed by *Muraenesox bagio* (35 %), *Anguilla bicolor* (21%), *Congresox* sp. (3.4 %), *C. talabonoides* (2.6 %), *S. sathete* (1 %) and *C. talabon* (1%) and other eel species in a very lesser proportion during all the years (Fig. 3).

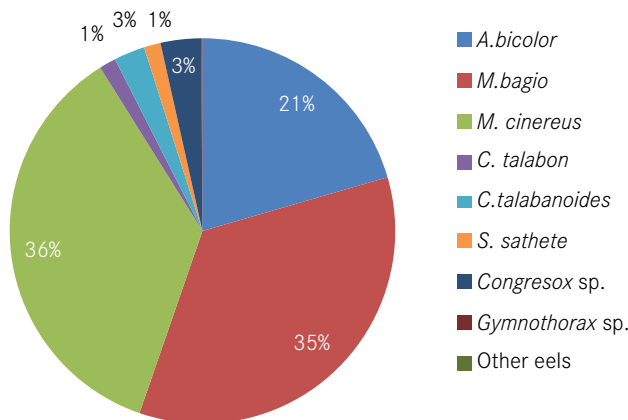


Fig. 3. Species composition of eels along Odisha coast during 2007-2021

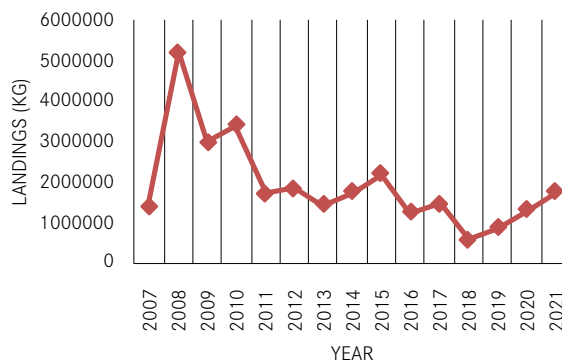


Fig. 4. Landing trends of eels along Odisha coast during 2007-2021

The estimated average annual eel landings during 2007- 2021 were 1189 tonnes and ranged from 561 to 5194 tonnes. The highest landing was recorded in 2008 (5194 tonnes) and the lowest of 561 tonnes in 2018 (Fig. 4). During 2021, the total eel catch was recorded to be 1752 tonnes, showing a 25% increase in landings compared to 2020 and contributing about

1.7 % to the total catch of the state. With an average annual catch per hour of 0.47 kg, the CPUE was 5.5 kg/unit. The highest landings of major eel species landed in 2021 were *Muraenesox bagio* (77.7%), *Strophidon sathete* (8.5%), *Congresox talabonoides* (8%) and *Congresox talabon* (5.8%). The landings were high during October-December, contributing about 813 tonnes (47.7%) followed by 493 tonnes (28.9%) during July-September period. The lowest of 123 tonnes (7.2%) was landed during mechanized fishing ban period (April-June) followed by January-March period (16.1%) along the coast (Fig. 5).

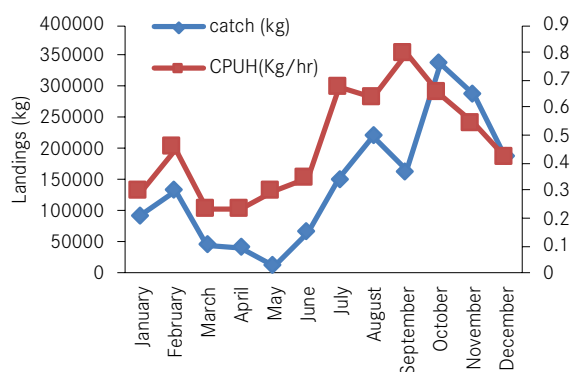


Fig. 5. Catch and effort trend of eels along Odisha coast during 2021

Puri district with the longest coastline (155 km) has eel landings dominated by *Muraenesox bagio* and *Strophidon sathete* in the longline operations at Pentakata and Chandrabhaga. Length range for *M. bagio* and *S. sathete* were 95-190 cm and 60-240 cm respectively. Longline fishing is targeted for eels, catfishes, grunters, seerfish and croakers. Bigger-sized eels are caught in longline operations in southeast direction at 35-50 km from Puri. The longline is operated by outboard fibre-glass boats of OAL (Overall Length) 9-10m with engine power of 9 HP at 30-40m for 3-5 hours in a day. During fishing, small pelagics such as *Sardinella fimbriata*, *Rastrelliger kanagurta*, *Thryssa sp.*, *Setipinna sp.*, *Alepes kleinii* and *Decapterus sp.* are used as bait.

The eels landed in Paradip fishing harbour, the major fishing harbour and in other landing centres of Odisha are processed and auctioned at the rate of ₹50-350 per kg. *Muraenesox bagio* is mainly targeted by the fishermen for its high market demand, which fetches a good market price of ₹300-350/kg and the airbladder of



Fig. 6. Deskinning of eels for dry fish preparation

this species is usually used for pharmaceutical purposes and sometimes discarded. *Strophidon sathete* which comes as a by-catch is sold at ₹50-60/kg in fresh. As there is less demand in local markets most of these eels are packed in plastic and thermocol boxes along with ice and transported to nearby states. The low valued eel, *Strophidon sathete* are first cleaned and then the skin is removed and degutted (Fig. 6). The rest body is dipped in salt water for 7-10 days then dried in sunlight by traditional method. The salted dried eel is sold at a price ₹100-150 in local markets. Dried eels are sent to states like West Bengal, Andhra Pradesh, Kerala and Tamil Nadu. Promotion of improved processing and packaging methods would help to fetch better economic returns to the fishermen families engaged in eel fishery. Assessments of the stock, its sustainable potential and collect data on the biological parameters of this group for proposing a Minimum Legal Size for fishes landed, will assist in formulation of fisheries management plans.

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