An overview of the tuna fishery in India with special reference to the spatial distribution and biology of *Thunnus tonggol* along the northwest region

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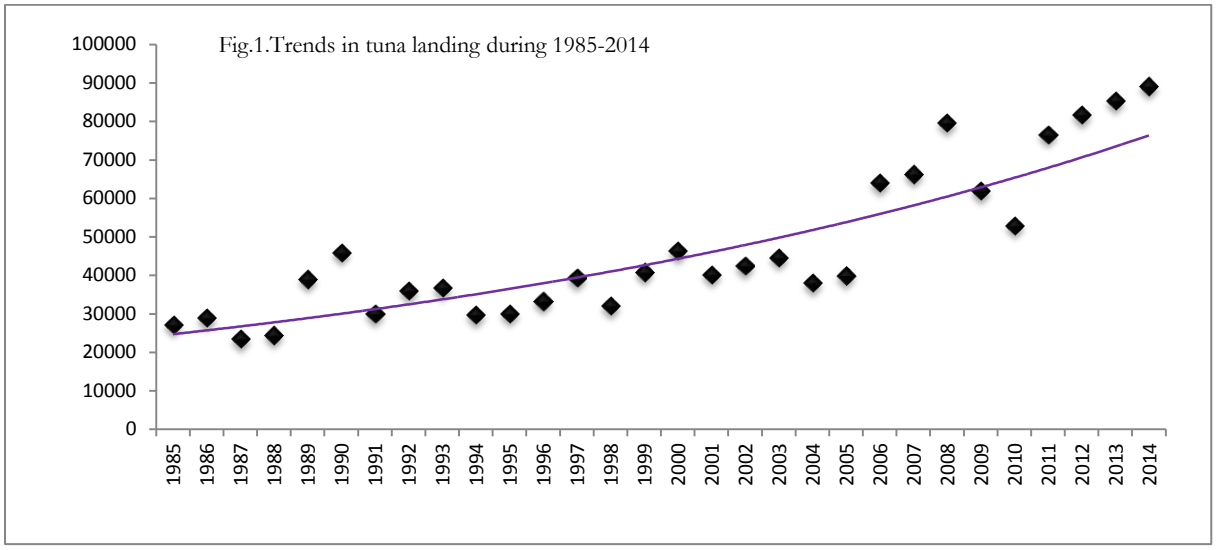
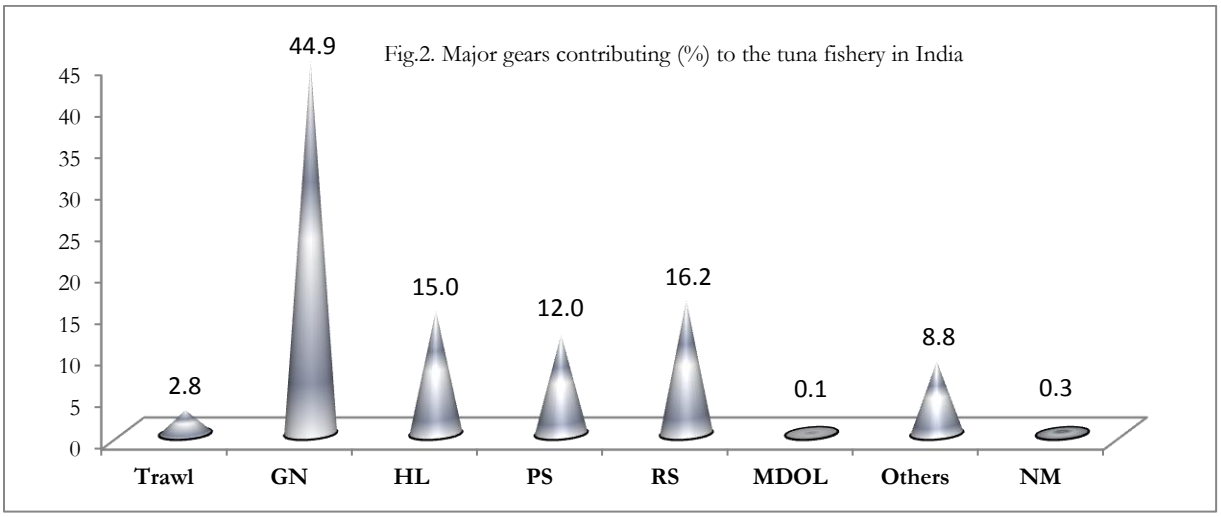
Abstract:

Tunas with an estimated landing of 88,840 t during 2014 have registered an increasing trend over the years. Andhra Pradesh followed by Kerala, Tamil Nadu and Gujarat were the major coastal states contributing to the total tuna catch. Exploitation was mainly by gillnets (44.9%), seines (28.2%) and lines (15%). The neritic and oceanic tunas contributed 65.2% and 34.8% of the total tuna catch respectively. *E.affinis* followed by *T.tonggol* were the dominant species among neritic tunas. Maximum contribution to the neritic tunas catch was by Andhra Pradesh followed by Kerala, Tamil Nadu and Gujarat. Fishing data collected from mechanised multiday gillnetters, the main gear exploiting tunas along the Saurashtra Coast of Gujarat substantiated the typical neritic nature of the long tail tuna and indicated that there are distinct areas of abundance over the seasons. The post monsoon and winter periods were the peak longtail tuna landing time. During summer, the areas of abundance were located between 100-200 m depth zone off Veraval and during winter abundance was in area closer to the shoreline at depth ranging between 20-30 m. Fork length of *T.tonggol* in the landings ranged from 25.8 to 81.9 cm with a mean length at 57.9 cm. The length at first maturity was 49.8 cm.
The population parameters estimated for *T.tonggol* were L =107.5 cm and k=0.40/yr. Stock status indicated that it is in healthy state and had scope for further exploitation.

The tuna fishery in India comprising of nine species are exploited mainly by gill nets, seines (purseseine and ringseine) and lines (longlines, pole and line and troll lines). The pole and line is the major gear in Lakshadweep islands. The catch made by the smaller crafts (LOA≤ 20 m) operating mainly long lines, trollines, gillnets and purseseines along the mainland has registered an increase over the years (Figs.1 & 2.).





During 2014, an estimated 88,840 t were landed by these crafts. The neritic tunas comprising of *Thunnus tonggol, Euthynnus affinis, Auxis thazard, Sarda orientalis* and *A.rochei* formed 60,398 t (68%) and the oceanic tunas represented by *Thunnus albacares, T.obesus, Katsuwonus pelamis,* and *Gymnosarda uicolor*

formed 28,442 t (32%) of the total tuna landings. The species composition of the tunas landed is given in Fig. 3.

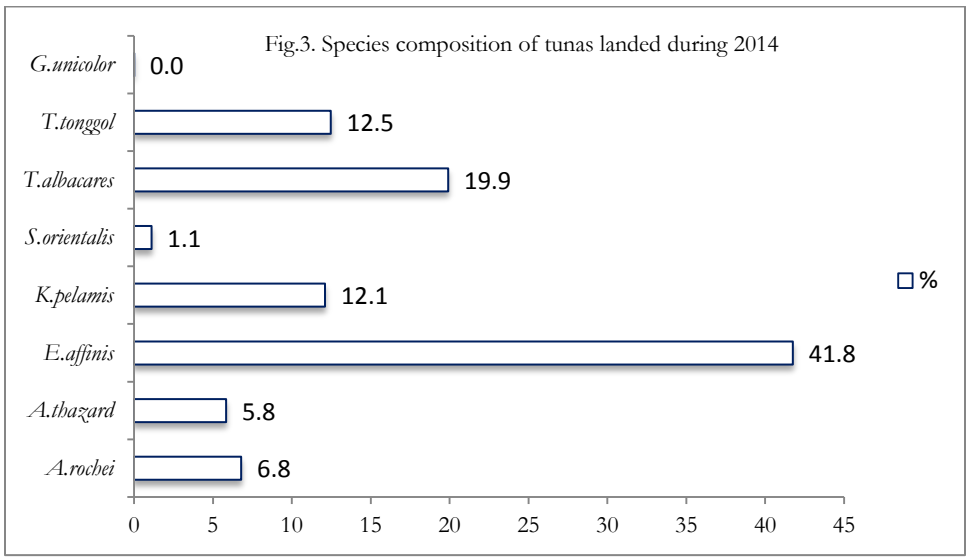


Fig.3. Species composition of tunas landed during 2014

Euthynnus affinis was the most dominant tuna species followed by *T.tonggol* among the neritic species. Of the maritime states in India that contributed to the total tuna landings Andhra Pradesh came first with a contribution of 30.84% followed by Kerala Tamil Nadu and Gujarat (Fig.4). Andhra Pradesh followed by Kerala, Gujarat and Tamil Nadu were the major contributors to the neritic tuna catch. (Fig.5).

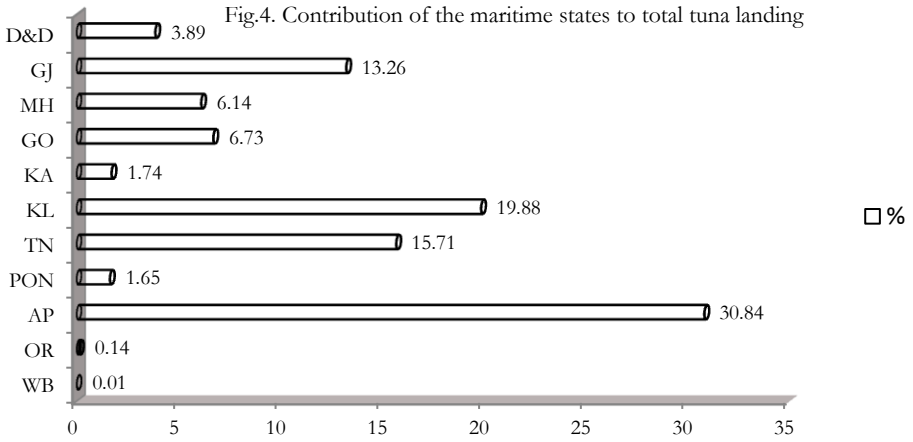
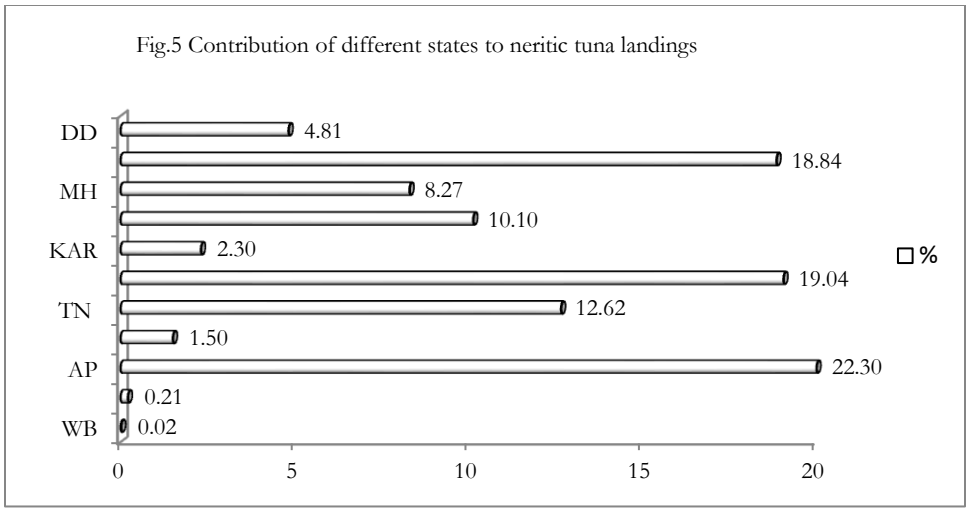


Fig.4. Contribution of the maritime states to total tuna landing



Thunnus tonggol, the largest growing species among neritic tunas comprised 12.5% of tuna landings and 17.81 % of the neritic tunas. This species not uniformly distributed along the Indian Coast and is confined to the south east and all along the west coast. Maximum landing were observed in the northwest coast along Daman-Diu- Gujarat–Maharashtra coast (94.3%) followed by the south west coast, Kerala-Karnataka-Goa (5.6%). Along the east coast, *T.tonggol* landing was observed only in Tamil Nadu and Andhra Pradesh. Tamil Nadu contributed the maximum. Landings along the northeast coast were minimal (Fig.5).

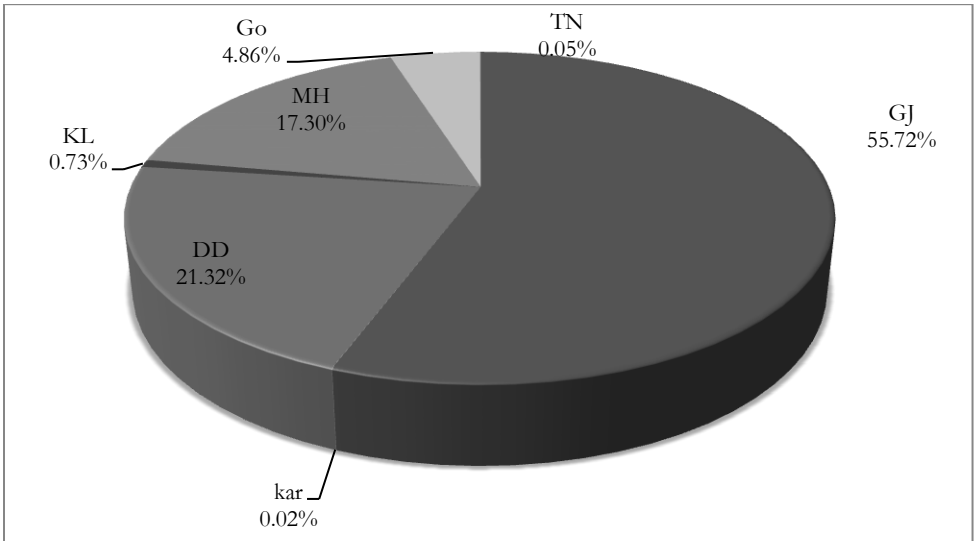
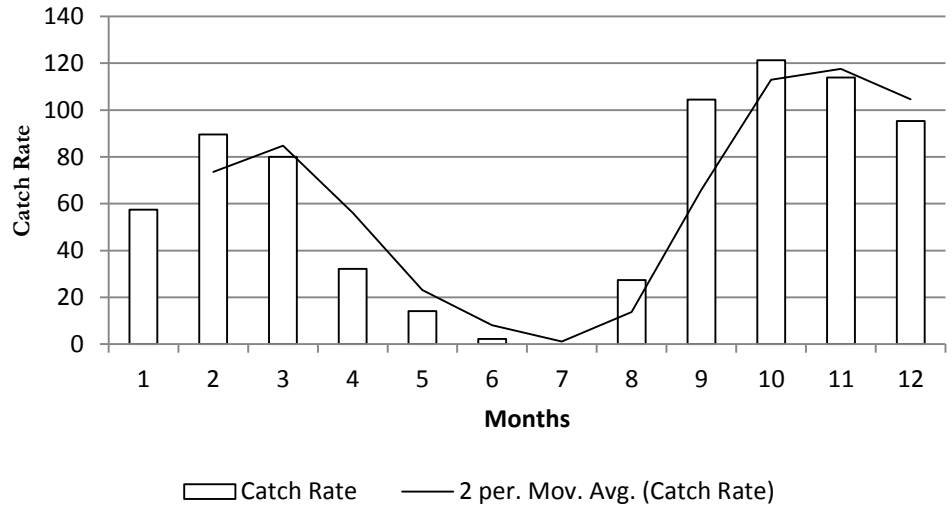


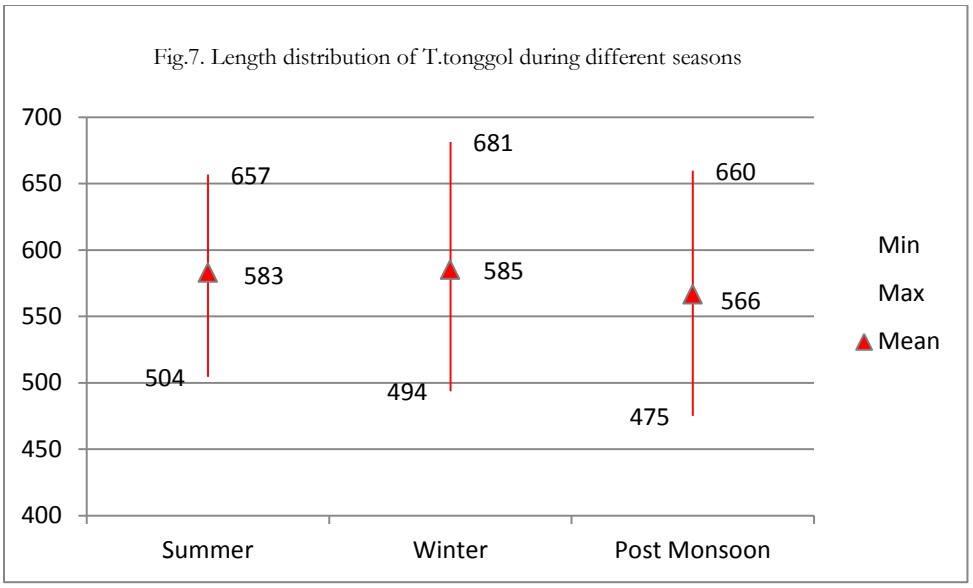
Fig.5. Contribution of different states to *T.tonggol* landing

The biology and distribution of longtail tuna exploited along the Gujarat coast indicated that this species occurred throughout the year with maximum landings during the post monsoon months (October-November). Exploitation in this region is mainly with large meshed gillnets (140-160 mm) operated from mechanized crafts. These units mostly operate for five to seven days in a row at depths ranging from 20-200 m. Operational area extended to deeper waters during summer months and coastal areas during winter. A positive relationship was observed between SST and *Thunnus tonggol* occurrence in this region. Catch rates (per unit) ranged between 2.2 kg to 121 kg with a maximum during October followed by November (Fig.6) per unit.

Fig. 6 Monthly catch rate of Longtail tuna in the gillnet fishery of Gujarat



The fork length of the *T.tonggol* landed at Gujarat ranged from 25.8 to 81.9 cm with a mean length of 57.5 cm (Fig.7). The size ranges were highest during the post monsoon months of August to October indicating that the smaller size fishes were occurring in the catches during the post monsoon seasons.



Females dominated the catch with a male: female sex ratio of 1:2. The length at first maturity was estimated at 49.8 cm and absolute fecundity at 11.9 million numbers. Food and feeding studies indicated that the *T.tonggol* fed mainly on smaller fishes and crustaceans. Stomach condition during different months indicated that feeding was more intense during the cooler months with a greater proportion of full and three fourth full stomach.

The population parameters estimated were L =107.5 cm and k=0.40/yr. Stock status indicated that it is in healthy state and scope for further exploitation to maintain the population at sustainable levels.