Crocodile shark (*Pseudocarcharias kamoharai)* distribution and abundance trends in pelagic longline fisheries

by

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ABSTRACT

Crocodile shark (*Pseudocarcharias kamoharai*) is mid-sized (max. total length ~130 cm) oceanic epi- mesopelagic shark recorded worldwide in the tropical oceans. It was seldom in most commercial fisheries during last century. Recent data obtained by observers from commercial pelagic longline operations show that crocodile shark becomes abundant species in several areas of the World Oceans, in particular southern Indian Ocean. We analyzed worldwide longline research and fisheries data (1950-2005) to estimate crocodile shark abundance and distribution. We modelled its abundance using the delta distribution approach to fit into the GLM framework. We found that ocean basin, target species, moon phase, season, bottom depth, gear fishing depth and deployment time significantly affected crocodile shark catches. Highest crocodile shark catch rates were observed in the Indian Ocean. Crocodile shark has a more heterogeneous distribution than highly migratory species like tuna, billfish, and other pelagic sharks. In the Indian Ocean crocodile shark is abundant in the subtropics but rare in the tropical areas. Opposite pattern occurred in the Pacific Ocean. In each fishery, encounters and catch rates increased with the number of years since exploitation commenced. This trend suggests an example of predator release, when depletion of large predators stocks has resulted in the increase of abundance of mid-sized pelagic species, such as crocodile shark. Our results may be first indicators of such fisheries-induced changes in the Indian Ocean pelagic ecosystem revealed by emergence of mid-sized species.

Keywords: crocodile shark, *Pseudocarcharias kamoharai*, longline fishing, rare species, abundance trends, geographical distribution, mid-sized predator/emergence