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SPECIES IDENTIFICATION OF THE SHARK CATCHES LANDED IN THE WEST COAST OF SRI LANKA WITH SPECIAL REFERENCES TO THE SILKY SHARK *Carcharhinus falciformis* (Bibron,1839)

by

P. D. KAMAL DEWAPRIYA AMARASOORIYA

1999

DECLARATION

"The work described in this thesis was carried out by me under the supervision of Professor J. Jinadasa and Dr. Mrs. C. Amarasiri and a report on this has not been submitted to any University for another degree."

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ABSTRACT

This study was based on the catch sampling of gill net and long line fisheries carried out at Negombo – Pitipana fish landing centre. Additional observations were also made at the Beruwala fish landing center regarding pecies identification. This study revealed the occurrence of 48 species of pelagic and demersal sharks belonging to 5 orders, 15 families and 26 genera in the catches landed in the west coast of Sri Lanka.

The orders identified were Hexanchiformes, Squaliformes, Orectolobiformes, Lamniformis and Carcharhiniformes.

The most diverse order among them was Carcharhiniformes. It comprised 4 families, 13 genera and 29 species. The identified families of this order were Triakidae, Hemigaleidae, Carcharhinidae and Sphyrnidae.

Among the identified species belonging to this order, there were two *Mustelus* species *M. manazo,* and *M. mosis,* 14 *Carcharhinus* species *C. albimarginatus, C. altimus, C. amblyrhynchos, C. amboinensis, C. brevipinna, C.falciformis, C. hemiodon, C. limbatus, C. longimanus, C. macloti, C. melanopterus, C.plumbius, C. sorrah, C. wheelery,* and 3 *Sphyrna* species *S. lewini, S. mokarran* and *S. zygaena.* The other genus comprised one species per each, *Hemipristis elongatus, Galeocerdo cuvier,Lamiopsis temminki, Loxodon macrorhinus, Negaprion acutidens, Prionace glauka, Rhizoprionodon acutus, Scoliodon laticudus, Trionodon obesus,* and *Eusphyra blochii,.*

The second most diverse order in the catches was Lamniformes and it comprised 4 families, 4 genus and 8 species. The families were Odontaspididae, Pseudocarchariidae, Alopiidae and Lamnidae.

There were two *Odontaspis* species, *O. noronhai* and *O. ferox,* three *Alopias* species, *A. pelagicus, A. superciliosus* and *A. vulpinus* and two *Isurus* species *I. oxyrinchos* and *I.paucus*. There was one species belonging to the genus *Pseudocarcharias* and that was *P.kamoharai.*

The number of families and genera present in the order Orectolobiformes were same as in the order Lamniformes (4 and 4), but the number of species identified were 5. The families of this order were Hemiscylliidae, Ginglymostomatidae, Stegostomatidae and Rhiniodontidae.

Two of the identified species in this order belonged to the genus *Chiloscyllium.* They were *C. griseum and C. indicum.* The other three genus comprised one species each namely, *Nebrius ferrugineus, Stegostoma fasciatum* and *Rhiniodo typus.*

The order Squalidae comprised 2 families, 4 genera and 5species. The identified families of this order were Echinorhinidae and Squalidae. The former family comprised one species *Echinorhinus brucus* and the latter comprised 4 species of 2 genera namely, *Centrophorus moluccensis, C. uyato, Centroschyllium ornatum* and *Dalatias licha.*

The least diverse order in the catches observed was Hexanchiformes. It comprised only one family (Hexanchidae), one genus and one species *Hexanchus griseus.*

Out of the above 2 families, **Psedocarchariidae** and **Squalidae** and ten species ***Centrophorus moluccensis, C. uyato, Centroschyllium ornatum, Hexanchus griseus, Odontaspis noronhai, O. ferox, Psedocarcharhis kamoharai, Isurus paucus, Carcharhinus albimarginatus*** and ***C. plmbius*** were found to be hitherto unrecorded taxa from Sri Lanka.

Over 90% of the sharks landed were belonged to the order Carcharhinidae with ***Carcharhinus falciformis*** (75%) being the most dominant species and it has dominated the catch almost through out the year. The thresher sharks (family Alopiidae) and the hammerhead sharks (family Sphyrnidae) were caught in large numbers during the south-west monsoon periods.

The combination of drift gillnet and longline was the main gear used in the shark fishery and the longline operations declined markdly during the monsoon period. The fishing operations were entirely carried out by the multiday fishing vessels which were over 10m in length. The average fishing days per trip was 5 and no. of operations per day was 01 for these vessels.

Skipjack tuna (***Katsuvonus pelamis***), Silky shark (***C. falciformis***) and Yellowfin tuna (***Thunnus albacares***) were the major species of the large pelagic catches landed. The average CPUE for all the large pelagic species was 266kg per operation and that for the above three species were 71, 67 and 60 kg per operation respectively.

The contribution of the major species of the large pelagics, Skipjak tuna, Silky shark and Yellowfin tuna ***Thunnus albacares*** to the estimated annual total production was 29%, 25% and 22% respectively. However over 33% of the total catch was made up of the sharks.

Forty three percent of the total number of Silky sharks were caught in gillnets and 57% were caught in long lines. Size of the fish caught by gill nets ranged from 65cm to 255cm and that of the long line from 75cm to 285cm. The mean length and standard deviation for the gill net catch were 125.15cm and 33.8 while those for the long line catch were 160cm and 97.6.

During the south- west monsoon months, most of the fishing operations were carried out relatively closer to the island, while during the other months, there was a tendency to extend the fishing operations more towards the north-western direction, even beyond the Laccadive islands.

The values for asymptotic length (L8) and growth coefficient (K) estimated for the stock of silky shark were 325cm and 0.3 $year^{-1}$ respectively. The instantaneous total mortality coefficient (Z) was1.68, the natural mortality coefficient (M) was 0.42, and the fishing mortality coefficient (F) 1.26. The catchability coefficient for the gill net and longline combination gear was $5.6*10^{-5}$.

The recruitment pattern of ***C. falciformis*** during the study period shows one peak around late July early August. The estimated exploitation rate (E) was 0.75 for the existing silky shark fishery. As the present level of exploitation seems to be high, it is suggested that management measures are needed to sustain the stock.