

## A note on the targeted fishery for deep-sea Oil Sharks at Cochin Fisheries Harbour

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Since 2002, due to heavy demand for the deep-sea shark liver oil from pharmaceutical companies and foreign nations, a targeted fishery for the deep-sea gulper sharks (*Centrophorus* spp.), which is locally called *mullan sravu* (vernacular for shark having spines) or *enna sravu* (oil shark) was observed from the landings at Cochin Fisheries Harbour. During this period, deep-sea chondrichthyans other than gulper sharks like the bramble shark *Echinorhinus brucus* and chimaera *Neoharriotta pinnata* were also landed as by-catch in the deep-sea shrimp trawl fishery which were also utilized similarly for oil extraction (Fig. 1). Squalene (a highly unsaturated aliphatic hydrocarbon) rich liver oil from the gulper sharks is used in health products, commercial skin creams and moisturizers, with fishermen themselves often using the crude liver oil for winter issues and skin problems. When landed in large quantities, they were taken to nearby processing centres, and processed for its meat by filleting and salting and also sold locally. The large livers were removed, oil extracted and stored in large barrels to be either distributed to

pharmaceutical companies or sold to exporters and local merchants. Shark jaws were also sold or exported to souvenir collectors abroad and in 2009-10, there was a demand for *E.brucus* jaws which were exported from Cochin to USA. Certain online stores showed a rate of \$10-15/per jaw which are removed from head without damage, keeping intact shape (Fig. 2). The fins which have lesser value compared to coastal sharks are also used. Deep-sea sharks like *Echinorhinus brucus*, *Hexanchus griseus*, *Alopias superciliosus*, *Centrophorus* spp., *Squalus* spp., are being used for dried salt meat preparation with the last two also gaining in consumer preference for fresh meat of late. The high water content in *E.brucus* and *H.griseus* are considered as drawbacks while using it for food in fresh condition. Shark cartilage in general is a good source of chondroitin and glucosamine sulfate and used as food, in pharmaceutical industry etc in various parts of the world. However, deep-sea shark cartilages are soft and are normally cut with meat and not used separately.



Fig. 2. Processed jaws of *E.brucus*



Fig. 1. Processing of catches

The market driven significant increase in the deep-sea chondrichthyans landings at Cochin especially during 2002-09. Since 2009 there were only occasional landings of deep-sea sharks and chimaeroids and the targeted fishery never achieved the levels reached as during 2002-2008 period. Personal interviews of long line fishermen at Cochin in 2012 and 2013 revealed that targeted deep-sea shark fishery on the west coast has slowed down due to small size of sharks available, varying prices and coastal teleost fishes getting higher price making targeted deep-sea shark fishing less profitable. However, on 10.12.2013 two multi-gear steel vessels operated off Munambam by longlines at 300-400 m depth landed 350 kg of gulper sharks

dominated by *C.atromarginatus* and 28 tonnes of *E.brucus* (Fig.3).

Deep-sea chondrichthyans are characterised by slow growth, low fecundity, long time to reach sexual maturity, long gestation period. Recent studies from Indian waters revealed that fecundity of deep-sea sharks are very low as in *C. cf. granulatus* (2), *E.brucus* (32), *C. atromarginatus* (2), *Cephaloscyllium silasi* (2), *Eridacnis radcliffei* (2), *Bythaelurus hispidus* (2), *Alopias superciliosus* (1) and *Heptranchias perlo* (7) compared to millions of eggs in teleost fishes. This ascertains the need for a precautionary approach in targeted elasmobranch fishery and need for monitoring the by-catches also.