

SHARK FIN RAYS - TECHNOLOGY OF EXTRACTION

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A simple process is described for extraction of rays from shark fins. The process consists in treating the rays with acetic acid to soften the tissue, separation of the rays by hand and drying. White fins yield almost double the quantity of rays compared to black fins.

INTRODUCTION

Elasmobranch fishes, sharks, skates and rays, constitute a good percentage of the total marine landings in India. These, in general, are not relished as food because of the high urea content of their flesh and the consequent undesirable taste and flavour. Of these, sharks possess some commercial importance owing to their liver oil content, which is a source of commercial quantities of natural vitamin A.

Sharks are available in the east and west coasts of India and their size varies from 25 cm. to about 500 cm. During 1972 there was a landing of about 46,000 m. tons of sharks in India. Apart from liver, fins fetch good returns for the fisherman. Dried shark fin is an item of export from India mostly to Singapore, Hongkong and the United Kingdom. Table I provides an account of export of shark fins from India.

Of the 37 species of sharks available in Indian waters, though fins from several species are exported, only a few fetch good prices, the maximum being fetched by 'Ranja'

(*Rhycobatus djiddensis*). Other major varieties of which the fins are exported are "Pisori" (*scoliodon walbheemi*), "Khada" (*Carcharinus melanopterus*) and "Kanar" (*Zygaena malleus*). Sharks are broadly classified into two varieties, black and white, and fins both varieties are exported. Dorsal, ventral pectoral and caudal fins are used.

Fins are cut from sharks of about 125 cm. or more in length as soon as they are landed avoiding as much flesh as possible and are thoroughly washed in water after removing the adhering flesh. They are then dusted with salt in the ratio 1:10 (salt to fins), the cut portion being sprinkled liberally with salt. A little lime also is often sprinkled at the cut portions and are set aside for 24 hours. They are then dried after gently washing in clean water to remove solid salt and excess lime to a moisture content not more than 10%. The dry fins thus prepared are graded for export according to size and type (position) of the fin.

TABLE I
Export of Shark fins*

Year	Quantity in Tons	Value in Rs.
1969	214	45,51,000
1970	282	59,98,000
1971	295	51,89,000
1972	294	60,27,000
1973	252	65,69,000

*This includes export of fish maws also.

GRADES

(I) Dorsal, ventral and pectoralfins.

Grade Designation.	Size in cm.
A	Below 10
B	10 and below 20
C	20 and below 30
D	30 and above.

(II) Caudal (tail) fins.

A	Below 20
B	20 and below 30
C	30 and below 40
D	40 and above.

The length of the dry fin is measured from the tip to the upper or anterior corner (I. S. I. 1969).

In the importing countries the fins are further processed for the 'rays' they contain which are considered to be a delicacy in the preparation of soup. If the rays are extracted from the fins and exported in place of fins it will fetch better returns in the export market. Further, the shipping volume will be reduced thereby reducing the freight charges. It will also ensure an employment potential and better returns to the primary producer.

Shark fin rays have appreciable internal demand in major hotels, which is at present met by imports. Therefore production of fin rays in the country can effect a saving in foreign exchange spent on its import.

Taking all these aspects into consideration experiments were undertaken at the Central Institute of Fisheries Technology for working out a standard procedure for extraction of rays from shark fins. The results of investigations are presented in this paper.

MATERIAL AND METHODS.

Both wet and dry fins were used in these studies. Fins were cut from the fresh sharks landed and dried according to the procedure mentioned earlier. When wet fins were used they were transported to the laboratory immediately after cutting and processed without delay.

Fins are soaked in 10% (v/v) acetic acid for 24 hours, taken out and the shagreen (calcareous material similar to scales in other fishes) scraped off. The adhering scrap residues are washed away with water and further soaked in the same acid till the muscle becomes soft. In the case of dry fins with 10-15% moisture the soaking can be continued for 4-5 days so as to hydrolyse the collagen in the skin to gelatin. If the skin and muscle do not get sufficiently softened, particularly in the case of dry fins stored for over an year because of its lower rehydration capacity, the soaking may be continued for a further period of a day or two. If the fins are still not soft enough to permit easy separation of the rays they may be treated with hot (50-60°C) acetic acid for 1½ - 2 hours depending on size to obviate further prolonged storage which otherwise becomes necessary.

TABLE II

YIELD OF RAYS FROM FINS

Nature of fins	Type of fins	Length in cm.	Yield in %
White fins fresh	Dorsal & Ventral	25 - 30	4 - 5
	"	12 - 15	3 - 4
	Caudal	25 - 30	3 - 4
	"	12 - 15	2 - 3
White fins dry	Dorsal & Ventral	25 - 30	22 - 25
	"	12 - 15	12 - 15
	Caudal	25 - 30	5 - 6
	"	12 - 15	3 - 4
Black fins fresh	Dorsal & Ventral	25 - 30	2.5 - 3
	"	12 - 15	2 - 2.5
	Caudal	25 - 30	2 - 2.5
	"	12 - 15	1.5 - 2
Black fins dry	Dorsal & Ventral	25 - 30	12 - 15
	"	12 - 15	6 - 8
	Caudal	25 - 30	5 - 6
	"	12 - 15	4 - 5

At this stage skin and the softened muscle are scraped off and the rays are separated from the flesh while washing with water. Alternately if the rays are to be extracted in clusters, as is preferred in certain markets, as much flesh sufficient to hold the rays together at the base is retained. The rays thus extracted are washed free of acid with water and are dried under sun or in an artificial drier at temperature about 50-60°C (about 4 hours) to a moisture content of nearly 10%.

RESULTS AND DISCUSSION

Though both white and black varieties

of fins contain rays the yield from the black varieties is only about half of that from white varieties. There exists wide variation in the content of rays in the fins from different body parts, the caudal fins containing the least. Yield of rays from fin from different body parts is as presented in Table II.

Fins from black varieties contain rays interspaced with cartilageous bone type things which form the bulk and hence the low yield of rays; whereas in the white varieties no such bones exist and the entire structure is constituted by rays. With res-

pect to caudal fins, though massive in appearance, only the lowest portion contains rays. The projection to the upper or anterior corner contains only few small sized rays which neither have any good appearance nor lend themselves to smooth extraction.

Fins which are dried and stored for very long periods required to be treated with hot acetic acid to avoid very long treatment otherwise required for softening the flesh and subsequent separation of rays.

Such heat treatment, though does not result in any significant difference in the yield, results in reduction in the length of the rays up to 30% with a proportionate swelling in diameter. However, rays of such nature, thicker in diameter find fancy with certain consumers and for this purpose, the rays can be prepared by the heat treatment method.

SUMMARY

If shark fin rays are exported in place

of fins as such it can ensure better economy and present day import to the country can be stopped. A method is described for the extraction of rays from wet and dry fins which involves treatment with acetic acid to soften the flesh and the separation of the rays by hand. Fins dried and stored for very long periods require treatment with hot acetic acid to curtail the otherwise prolonged treatment required.

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REFERENCE

Indian Standard specifications. for dried sharkfins, I. S: 5471, 1969.