Squilla-An Untapped Marine Resource of India Possessing Vast Economic Potential

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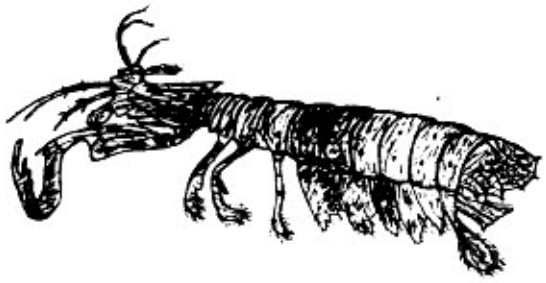
INTRODUCTION

Squilla is a marine animal netted abundantly along with prawns both on the west and east coasts of India. They resemble prawns both in appearance and habitat, inhabiting burrows in the sand and mud at the bottom of the sea. They are known by different names in vernacular like 'Puzhu', Poochi', 'Chelli' etc and are thrown over-board most of the times, as they are not usually used for any purpose whatsoever, probably because their meat contents are meagre and difficult to be separated from the shell portions. Not even a rough estimate is yet available on the abundance of this resource in our waters; but it may not be wrong to assume that it may be anywhere in the vicinity of that of prawns. There has been one instance of export of ten tonnes of dried squilla tails from India worth Rs. 13,200 to the United Kingdom in the year 1974. Methods have now been made available for utilization of this unexploited commodity so that the Indian fishery industry can take advantage of them for its further prosperity.

BIOLOGICAL FEATUSES

Squilla belongs to the phylum: *Arthropoda*, class: *Crustacea*, sub-class: *Malacostraca*, series: *Eumalacostraca* and division: *Hoplocarida*. They live in burrows on the sea bottom. They are a down-wardly flattened group of crustaceans, often referred to as 'mantis-shrimps' in Australia as their claws closely resemble the front legs of the insect 'praying mantis'. One species is named *Squilla granti* Stephenson after Mr. E. Grant who collected large numbers of them for the first time. This species usually grows to 7.5 cm in length. Other species occuring in Australia include *Squilla interrupta* Kemp (17.5 cm) and *Squilla raphidae* Fabricius (25 cm). They are active and predatory having an impressive pair of toothed raptorial claws which hold small fishes and other animals firmly and push them into their mouths. Care has to be taken while handling the live animals, lest the sharp teeth in the claws should cause injury on human skin. The strong spines at the outer edges of the tail are also capable of causing painful bruises if the animals struggle to wriggle out of the human fists.



In Australia they are usually known as 'prawn-killers', because it is a very common occurrence that prawns are clutched in their claws when they are shaken out of the cod ends of trawl nets. But in fact, this is only an inadvertent grasping of any object within reach during their embarassment after being netted and hence the allegation appears to be unfounded.

The carapace is short and fused only with the first three segments of the thorax, leaving two movable segments in the head region, one of which bears the stalked eyes and the other the antennules. The first five pairs of thoracic appendages are directed forwards and act as maxillipedes, the second one being exceptionally large and predatory. The first five pairs of abdominal appendages have gills attached to them. Eggs are carried by the females. Larvae are transparent and pelagic and are found in large numbers in plankton collections. Three important species of the animal mainly encountered in India are *Oratosquilla nepa*, *O. holoschista* and *Harpiosquilla naphida*.

UTILIZATION ASPECTS

Negligible quantities of squilla are converted into meal at some places in India at present, while the bulk of the material netted along with prawns etc in trawl nets is wasted.

Chemical composition: A comparative Statement of the proximate chemical compositions of squilla, jawla prawns and prawn shell waste is presented in the following table.

Characteristic	Squilla	Jawla prawns	Prawn shell waste
Moisture: %	78.84	78.40	76.62
Protein : % dry basis	44.71	71.88	39.76
Fat : ,, ,,	2.68	5 21	5.05
Ash : ,, ,,	35.42	17.30	31.13
Chitin : ,, ,,	14.70	11.00	23.08

It may be seen from the tabie that squilla and prawn shell waste from processing factories have more or less similar chemical compositions, while jawla prawns contain comparatively higher ptoportions of protein and lower chitin and ash contents.

Extraction of proteins: A simple method worked out to isolate the proteins from squilla consists in blending it finely with an equal quantity of water using an electric blender. The slurry obtained thus is filtered through a sieve to with-hold the chitinous material. The

filtrate is heated at 112° C for 15 to 20 minutes, when the proteins get precipitated. The precipitate is filtered and dried either in the sun or in vacuum at 45 to 50° C. Recovery of protein by this method is 73.23% of the original quantity present in the squilla, part of the rest of the proteins being lost as soluble matter being carried away by the filtrate, while some further quantity is lost along with the shell material. The product obtained is brownish in clour and contains essential amino acids like leucine, isoleucine, lysine, methionine, phenyl alamine and valine in quantities in excess of those recommended by the World Health Organization, while it is deficient to the extent of 20% and 80% respectively in the case of threonine and tryptophan compared to WHO standards. Feeding trials on rates show that the protein efficiency ratio of squilla proteins is comparable to that of the reference protein, caesin and that it equally or slightly more efficient than the latter in adding weight to liver and kidney in the experimental rates.

Preparation of chitosan: The squilla is boiled up with 1:1 proportion of 1% sodium hydroxide for 45 minutes and the aqueous portion decanted off. Boiling is repeated once again and the combined alkaline extracts concentrated to recover the proteins. The residue is further boiled with 3% sodium hydroxide solution for one hour to remove any residual proteins and the aqueous proteins and the aqueous portion decanted off. The proteinfree chitin is heated with 1:1 proportion of 50% sodium hydroxide solution at 100° C for 75 minutes for deacetylation into chitin. The aqueous alkaline portion is decanted off, the residue washed

free of alkali with water, dried in the sun and pulverised. The product is white in colour and hence obviates the need for bleaching as is done in the case of preparation of chitosan from prawn shell waste. It yields a highly viscous solution in 1% acetic acid at 1% level, the viscosity being almost double that given by similar product obtained from prawn shell waste.

CONCLUSION

Hence, if all the squilla netted in the trawl gear is collected instead of throwing them overboard on the open sea or discarding at sorting centres at landing places and utilized in the manners indicated above, it can go a long way in transforming the Indian mechanised fishing industry whose economy is already in the doldrums into a more profitable and viable endeavour. Probably an export market for the commodity may also be possible to be developed by propagating proper propaganda for it in the foreign markets.