PROTEIN FROM JAWLA PRAWN *(ACETES SPP.)* AND SQUILLA *(ORATO SQUILLA NEPA)*

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A simple method of isolation of protein from jawla prawn and squilla, which does not involve any chemical treatment, is reported. The method consists in blending the jawla prawn/ squilla with equal quantity of water, removal of chitinous matter, heating the pulp at 112°C for 15-20 minutes and drying the precipitated protein after filtration.

INTRODUCTION

About 80,000 tonnes of non-penaeid prawns are landed annually along the Maharashtra and Gujarat coasts. Jawla (*Acetes* spp.) prawn constitutes a considerable proportion of these. Its size is too small to be peeled for separating the meat. The usual practice is to dry whole prawn by spreading on beach. The landing season for jawla prawn is mainly from January to May, when the Bombay duck catches decline. The dried product is marketed as such.

Throughout the west coast of India, Squilla (*Orato squilla nepa*), also a shellfish, is available in plenty. It is landed along with prawn of the trawl catches. Even though it is atpresent utilised to a limited extent for making meal, the bulk of the catch is thrown back into the sea so that a correct estimate of its availability cannot be made under the present circumstances. A method for the utilisation of squilla for the production of chitosan has been reported earlier (Madhavan and Ramachandran Nair, 1975).

Attempts were made for the development of methods for better utilisation of these marine resources. The present paper reports a simple method for the isolation of protein from these less utilised crustacea.

MATERIALS AND METHODS

Fresh jawla prawns landed at Sassoon Dock, Bombay were iced and brought to the Institute's laboratory at Bombay and squilla caught by the departmental fishing boats from the sea off Cochin were iced and brought to the Institute's laboratory at Cochin, for protein isolation.

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TABLE I

PROXIMATE COMPOSITION OF JAWLA PRAWN AND SQUILLA

	Jawla prawn				Squilla			
	1	2	3	4	1	2	3	4
Moisture %	79.10	78.80	77.50	78.20	78.03	76.14	77.51	75.78
Ash % on dry weight	15.57	17.93	16.89	18.80	30.75	26.16	29.47	29.34
Total nitrogen ,,	10.90	11.74	9.67	13.67	7.87	7.72	7.46	7.39
Chitin nitrogen ,,	0.62	0.74	0.83	0.77	0.93	1.01	1.01	1.01
Fat (ether extractibles) wt.	4.85	3.80	7.70	4.50	3.66	2.62	2.81	2.53

TABLE II

YIELD OF PROTEIN FROM JAWLA PRAWNS AND SQUILLA

Ratio of Sample : water (wt. : vol.)	Jawla prawn				Squilla			
	Protein in whole sample PN×6.25 g.	Protein in filtrate after heating PN×6.25 g.	Protein recovered in the residue PN×6.25 g.	Percentage recovery of protein	Protein in whole sample PN×6.25 g.	Protein in filtrate after heating PN×6.25 g.	Protein recovered in the residue PN×6.25 g.	Percentage recovery of protein
1 : 1	17.15	2.40	11.31	65.97	13.12	1.04	9.44	71.94
	17.60	3.20	10.90	61.93	10.76	0.84	8.12	75.46
	18.81	4.10	12.54	64.67	11.08	0.92	8.36	75.44
	18.72	3.90	13.60	72.64	12.04	0.96	8.44	70.09
1 : 2	16.80	6.40	7.20	42.85	9.00	2.24	4.56	50.66
	18.70	7.80	9.60	51.35	11.12	1.24	6.88	62.23
	17.80	6.70	8.50	47.75	—	—	—	—
	18.00	4.70	9.00	50.00	—	—	—	—
2 : 1	Filtration found difficult				9.00	1.20	5.84	64.89
					11.12	1.32	7.44	66.91

Representative samples from each batch of the jawla prawns and squilla were analysed for moisture, ash, fat and total nitrogen according to the methods of A. O. A. C. (1960). Chitin nitrogen was estimated by digesting the crude fibre obtained after alkali extraction and estimating the nitrogen in the digest by microkjeldahl's method.

For the isolation of protein, the sample was blended with water in a waring blender. The slurry obtained was passed through a sieve to remove the chitinous matter. The chitin free pulp was heated at 112°C for 15 - 20 minutes. The precipitated protein was filtered and dried either in the sun or under vaccum (750mm. of Hg at 45 - 50°C). The protein left behind in the filtrate (cooked liquor) was also estimated.

Comparative studies were carried out on the effect of different ratios of sample to water (2 : 1, 1 : 1 and 1 : 2) for the initial blending to find out the best conditions for optimum recovery of protein from the sample.

Results And Discussion

Data on the proximate compositions of jawla prawn and squilla are given in Table I. In general total nitrogen and fat (ether extractibles) contents of squilla were lower and ash and chitin nitrogen contents higher than those of jawla prawn.

The results of a few typical trials on isolation of protein are summarised in Table II. The recovery of protein varies between 60 and 75% of the total protein content in both the cases. The recovered protein powder contains only negligible percentage of chitinous matter. Protein from jawla prawn had pinkish colour with the characteristic jawla prawn flavour and that from squilla was brownish in colour. Considerable improvement in the colour could be achieved by drying the precipitated protein under vacuum.

It may be seen from Table II that the best results are obtained with a minimum loss of protein when a 1 : 1 ratio of sample and water is used for the initial blending. In the case of jawla prawn, the slurry with 2 : 1 ratio was found to be too thick to facilitate easy filtration. The process reported is simple and does not involve any chemical treatment.

References

A. O. A. C. 1960. *Official Methods of Analysis*; 9th Edn. Association of Official Agricultural Chemists, Washingdon, D.C.

Madhavan, P. and K. G. Ramachandran Nair. 1975. *Fish. Technol.*, 12, 1:81.