

A NOTE ON PROXIMATE COMPOSITION OF TUNA FISH PASTE FROM MINICOY

[An indigenous method of preparing fish paste from Tuna fish., exclusively practiced in Minicoy island is described. Detailed proximate analysis data of the product is presented and it has been compared with the values obtained for similar products of foreign countries. A chromatographic study is also carried out for essential amino acids and also with special reference to detecting any possibilities of histamine poisoning, especially in view of the reported high values of histidine in Tuna meat. However free histamine is not detected in the sample.]

In the course of our study of Tuna fish processing in the Laccadive Islands, we came across an unusual type of fish paste obtained as a byproduct in the preparation of Masmeen, the major fishery product of this area. Although fish pastes & sauces obtained by fermentation are known in South East Asian countries, such products are rare in India. Moreover the present sample from Minicoy is obtained by concentrating the fish solubles and not by fermentation and in view of the recent interest in Tuna processing in India, the results of our chemical study are presented in this account.

Regarding the method of preparation it was reported that the water in which Tuna fillets are boiled (3 parts of Sea water diluted with one part of fresh water) for two hours and left to cool overnight, is reemployed repeatedly upto eight times for cooking fresh batches till it becomes thick. It is then concentrated to a thick paste adding at times scrappings of dried Masmeen. The finished product, known locally as 'RIHA AKRU' is stored in earthenware pots and used as a flavouring agent. It is used up mostly for internal consumption and is known to keep for one to two years.

Apart from its chemical composition detailed in the Table below, free amino acids were also studied by paper chromatography in view of the reports of fish poisoning due to histamine liberation from histidine, since, Tuna and Mackerel are known for their exceptionally high histidine contents. Boiling procedures and heat denaturation of protein result in release of histidine

as described by Russian workers'. Search for essential aminoacids formed the other objective.

TABLE
*Organoleptic & Analytical Data on Fish Paste from
Tuna collected from Minicoy*

Colour	:	Brownish
Consistency	:	Thick viscous slow-flowing fluid. Contains fine suspended granules (5%)
Odour	:	Good; no fishy smell
PH	:	6.45
Moisture (%)	:	43.53
Total Solids (%)	:	56.47
Ash content (%)	:	17.95
Acid Insoluble Ash (%)	:	0.07
Salt Content (NaCl%)	:	10.40
Fat% (dry wt. basis)	:	0.60
Total Nitrogen %	:	6.56
Non-Protein N%	:	5.63
Amino N%	:	1.43
T. V. N. mg%	:	309.0
Trimethylamine mg N%	:	nil
Calcium (Ca) %	:	0.43
Phosphorus P ₂ O ₅ %	:	2.77

5 gms. of the paste was suspended in 100 ml. of water, filtered and the filtrate desalted over Dowex-50. Aminoacids were eluted with 2N ammonia and examined after evaporation in vacuo. Glycine and histidine were observed in large amounts with traces of 3 others. Histidine content could be roughly assessed as 220 mg%. Masmeen itself, hard dried product of 25% moisture content, was next examined after acid hydrolysis and histidine content therein was 450 mg%. In view of these high histidine levels, search for histamine if any, was conducted employing Pyridine/Amyl Alcohol/Water Solvent with which the amine and the amino acid could be separated by prolonged development in the case of standards. It was observed that histamine is however practically absent in the fish paste under study as also in Masmeen.

In the absence of any data on similar products from elsewhere, only a few observations based on comparison with either condensed fish solubles or fish pastes and sauces described by Boury⁴ are presented below regarding the chemical quality of the present sample. The ash content is higher than 6% described by Sparre⁵ for herring solubles. This is reflected in the higher phosphorus level of 2.77% as against 1.5%. Protein content is nearly equal. Compared to Boury's data on various samples pH value appears to be a bit high but Westenberg⁶ recommends acidity to phenol red observed in the present case as a quality index. Salt content works out to 23.9% per 100gm. of water present. a minimum of 20% being enough on this basis according to

Boury. Moreover large amounts of free amino acids are themselves believed to act as preservatives. The T. V. N. (Total Volatile Nitrogen, level which forms the main index of quality, indicative of bacterial spoilage is not excessive, since it is below 10% Total Nitrogen, the suggested limit for judging fitness for human consumption. While it may range from 20 to 30% in some samples of 'Nuoc Nam'. T. V. N. in well prepared products is below 5% on the above basis. Although the absence of histamine in the present 2 to 3 month old sample is reassuring, the high level of histidine presents a potential hazard and further work is in progress. Upto 70 mg% of histamine were previously reported from Viet Nam in the case of 'Nuoc Nam'.

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