THE FREE α-AMINO ACID NITROGEN CONTENT OF THE SKELETAL MUSCLE OF SOME MARINE FISHES AND INVERTEBRATES

In the course of an investigation of the nitrogenous extractives of fresh fish muscle, the authors determined the α-amino acid nitrogen content of the aqueous extracts of the skeletal muscle in a number of marine fishes. The free α-amino acid nitrogen content was usually below 30 mg. N/100 g. of the wet muscle (Table I). These values were far lower than those recorded for lobster muscle by Kermack *et al.*[1] and also by Camien *et al.*[2] In the lobster the free α-amino acid nitrogen content accounted for 34-49% of the water-soluble non-protein nitrogen (N.P.N.) while in fish muscle it constituted usually about 6% of the N.P.N. (Table I). The determination of the α-amino acid nitrogen in crustacean and other invertebrate muscle therefore appeared to be necessary from the comparative aspect.

TABLE I

The values of nitrogen are given as mg. of nitrogen per 100 g. of wet muscle

S. No.	Name of fish	Non-protein nitrogen (N.P.N.)	α-amino nitrogen	α-amino N as % of N.P.N.
1	*Scoliodon* sp.	1096·0	71·69	6·5
2	*Sphyrna malleus*	1174·0	58·75	5·0
3	*Hilsa toli*	311·1	17·86	5·7
4	*Chirocentrus dorab*	272·1	16·81	6·2
5	*Tylosurus lieurus*	374·1	24·29	6·5
6	*Sphyraena obtusata*	(Not determined)	21·91	..
7	*Scomberomorus commersonii*	335·6	24·84	7·4
8	*Pampus argenteus*	353·0	20·32	5·8
9	*Decapterus russellii*	301·4	20·77	6·9
10	*Caranx hippos*	332·6	14·02	4·2
11	*Drepane punctata*	236·7	9·1	3·8
12	*Scatophagus argus*	296·1	23·81	8·0
13	*Sepioteuthis arctipinnis*	789·8	349·4	44·2
14	*Neptunus pelagicus* I	914·3	356·2	39·0
15	Do. II	473·9	210·3	44·4
16	*Penæus indicus*	772·9	326·1	42·2
17	*Homarus vulgaris* I*	820·0	358·0	43·7
18	Do. II*	762·0	306·0	40·2
19	Do. III*	805·0	280·0	34·8
20	Do. IV*	749·0	369·0	49·3

* Values reproduced from Kermack *et al.*[1] for comparison.

Analysis of crab and prawn muscle carried out by us showed a high level of α-amino N, of the same order as for lobster reported by the above workers. Further, squid muscle also showed a similar high level of α-amino N (Table I).

The voluntary muscle, which forms the bulk of the edible portion, is known to differ in structure in the vertebrates and invertebrates. It is striated in the former, while in the latter, particularly in the lower phyla, it is unstriated. The difference in the levels of the free α-amino acid nitrogen in fishes and in crab, lobster, squid and prawns probably reflects significant differences in the chemical composition of their muscle. High levels of α-amino N appear to be characteristic of invertebrate muscle. In view of these interesting indications of a chemical differentiation between vertebrate and invertebrate muscle, further investigations are being continued.

The free α-amino acid nitrogen was determined by the method of Pope and Stevens.[3] This method was also employed by Kermack *et al.*[1]

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MODIFICATIONS IN THE COLORIMETRIC ESTIMATIONS OF Mn AND Mo

WHILE conducting the colorimetric estimations of manganese by the periodate method and of molybdenum as thiocyanate, after reduction of any hexavalent Mo by stannous chloride, as described by Piper[1] (1944), the author found the following modifications helpful to avoid errors, unnecessary repetition of samples and waste of chemicals (Mukherjee,[2] 1956).

(*a*) *Mn.*—Presence of chlorine is a great hindrance for the development of the permanganate colour. Hence chlorine present as HCl in the sample extract has to be expelled and was done by slowly evaporating it to dryness till devoid of any smell. To this a fresh solution containing 1 g. ammonium persulphate was added and fumed strongly for 5 minutes on a hot plate. This ensured a complete colour development but