

COMPOSITIONAL ANALYSIS AND AMINO ACID PROFILE OF BOMBAY DUCK (*HARPADON NEHEREUS*) : AN UNIQUE HIGH MOISTURE FISH

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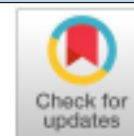
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ABSTRACT : Bombay duck (*Harpadon nehereus*) a high moisture containing fish, is considered one of the significant fisheries of the Maharashtra State. The soft and tender flesh and the bulk landing of this fish call for processing interventions for quick disposal of the bulk. Locally procured Bombay duck fish was utilized to determine the yield of mince, proximate composition and amino acid profile using standard methods. Manually scrapping of an edible portion from fish resulted in a remarkable 43.82% yield. Though the moisture content of the fish mince was found to be as high as 86.99%, the protein content of 10.35% on a wet weight basis should be considered very high. Amino acid profile revealed the presence of certain essential and non-essential amino acids, with histidine and tryptophan being absent. By reducing the moisture content of the mince, this white muscle fish can be utilized for preparing mince or surimi based protein rich low cost products.

Key words : Bombay duck, high moisture, mince, proximate composition, amino acid profile.

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INTRODUCTION

Bombay duck (*Harpadon nehereus*) is unique because it contains the highest moisture among all edible fishes. Because of very high moisture, muscle is soft, held by a skin cover and the fish body is flaccid. Thus, the fish is not an active swimmer and mostly feeds on acetes and anchovies. The fish is seasonal and caught in a narrow window between September to February with a peak between November to December (Rupsankar, 2010). However, the fish is caught in bulk and due to high moisture, it can't be processed easily. In general, the fish is dried & sold and a lesser volume is consumed fresh. Fresh consumption also needs partial dewatering before frying. The soft tissue along with fine bones in the fish pose processing challenges and is incompatible with machine processing. Though the bulk of the fish is dried under the sun, due to very high moisture between 85-90%, the fish does not dry quickly leading to partial spoilage (Kakatkar *et al*, 2003 and Jin *et al*, 2012).

The bulk landing of the fish along with the difficulty in drying calls for processing interventions for quick disposal of the bulk. At present, Bombay duck landing in

India is 1.27 lakh tonnes, concentrated mostly along North Maharashtra and South Gujarat (Handbook of Fisheries Statistics, 2020). An understanding of meat quality, meat and protein yields and protein quality will lead to better utilization of the fish and higher income for the fishermen. It is noteworthy that, the fish is caught by traditional fishermen mostly the subsistent fishers, using a typical bag net (called as 'Dol net' in Maharashtra and 'Golava' in Gujarat). Therefore, any additional income due to better utilization will add value to their livelihood. In view of this, the present work describes the proximate composition, the yield and amino acid profile of the Bombay duck.

MATERIALS AND METHODS

Raw material (Fish) and Mince preparation

Bombay duck (*Harpadon nehereus*) was procured from local fishermen, who go for single-day fishing soon after they arrived at Versova landing center in Mumbai, India (during November- February). The fish were transported in iced condition to the Department of Post-Harvest Technology laboratory, ICAR- Central Institute

Table 2 : Amino acid profile of Bombay duck mince (on wet weight basis).

Amino acid	g/100 g	%
Essential amino acid		
Histidine	0	0
Threonine	0	0
Valine	1.28	4.9
Methionine	1.01	3.85
Lysine	3.59	13.77
Isoleucine	1.06	4.07
Leucine	2.94	11.27
Phenylalanine	1.13	4.32
Tryptophan	0	0
Total EAA	11.01	42.18
Non-essential amino acid		
Aspartic acid	2.24	8.59
Glutamic Acid	4.49	17.21
Glycine	0.48	1.86
Arginine	1.54	5.91
Tyrosine	0.8	3.06
Serine	1.46	5.61
Alanine	2.31	8.85
Cysteine	0.11	0.42
Asparagine	0	0
Norvaline	0	0
Hydroxyproline	1.56	5.96
Glutamine	0.09	0.34
Total NEAA	15.08	57.81
Total AA	26.09	100
Total EAA/ Total NEAA	0.73	0.73

AA: Amino Acid, EAA: Essential Amino Acid, NEAA: Non-Essential Amino Acid

reported the higher presence of Aspartic acid, Glutamic acid and leucine in fresh Bombay duck. Also, the result obtained during this study is moderately significant to the observation obtained by Jin *et al* (2012) during the production of protein hydrolysates from Bombay duck (*Harpodon nehereus*). Though the concentration of essential and non-essential amino acids is less compared to other commercially important fishes, they are compositionally balanced for nutritional intake (Chandrashekar and Deosthale, 1993; Jin *et al*, 2012).

CONCLUSION

This study presents the Bombay duck's yield (%), proximate composition and amino acid analysis. In comparison to the weight of the entire fish, the yield of Bombay duck mince after manually scrapping off from the skin and bone was determined to be 43.82%. Based on the proximate composition findings, this study shows that Bombay duck, a lean fish with a high moisture content (86.99%), contains a substantial amount of crude protein

(10.35%). Amino acid profile of Bombay duck revealed the presence of 16 amino acids (essential and non-essential amino acids) out of a total of 21 numbers, thus making this fish nutritionally balanced.

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