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Proximate composition and sensory quality of fish cutlets, made from pangasius fish (*Pangasianodon hypophthalmus*)

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Abstract

Catfish are the backbone of Indian freshwater aquaculture production after Indian Major Carp due to their high demand and easy culture system. Catfishes are liked by consumers due to the unique flavour which comes from fish fat. However, consumers demand the product to have fish but not have a fishy smell and bones as well. For this pangasius fish (*Pangasianodon hypophthalmus*), a catfish was selected. The meat was separated from the fish and cutlet was prepared using fish along with Indian spices. These cutlets were evaluated based on proximate composition and sensory quality. Scores for sensory parameters appearance, colour, taste, odour, and overall acceptability. Results of proximate composition and sensory quality showed that the cutlet was in an acceptable condition and good in taste.

Keywords: Catfishes, consumers, evaluated, proximate

Introduction

India is a diverse country where there is a great scope to increase fish consumption. It is found that people prefer animal meat instead of fish meat due to the presence of intramuscular bones and fishy smell. This problem can be eliminated or minimized by value-added fish products. Value-added fish products means any activity which increases the usability, culinary attribute or economic viability of a food item. They are three main types mince or mince-based products, battered and breaded and surimi-based products. Fish mince or minced fish is the flesh separated from the fish in a comminute form free from scales, skin and bone some examples are fish-fingers, fish-patties, fish-burger, fish-sausages etc. This product may be a good food source for children, who are non-vegetarian and suffering from nutritional deficiencies or malnutrition since fish are a good source of easily digestible protein and omega 3 and 6 polyunsaturated fatty acids (Pawar *et al.*, 2012) [6].

Pangasius (*Pangasianodon hypophthalmus*) is a shark catfish native to freshwater. Farmers in India are culturing pangasius fish due to their adaptability to all kinds of environments and wide varieties of feeding habits. However, farmers are not getting good profits due to reduced margins (Rathod *et al.*, 2013) [7]. Processing of Pangasius fish (*P. hypophthalmus*) into value-added battered products enhances their acceptability and market value. In recent years, fish processing product development and value addition have received wide attention due to the increase in urbanization, and the involvement of women in the service sector (Pagarkar *et al.*, 2011) [3]. Therefore, to increase profitability development of value-added products from Pangasius fish is an urgent need of utilization for human consumption. The demand of ready to eat convenience is keep on increasing, one of the readily acceptable groups is battered products. In the present study, a value-added battered and breaded product "fish cutlet" developed from freshwater catfish Pangasius meat and to investigate the proximate composition and sensory quality.

Materials and Methods

Pangasius fish (*P. hypophthalmus*) were purchased from the local fish market of Jabalpur, Madhya Pradesh. The weight of the fish was 750 to 1200 grams. The freshly purchased Pangasius were brought to the processing hall in an ice box in hygienic condition.

The fish was washed with potable water then beheaded, gutted and again washed to get their fillets. The fillets were boiled for 20 min and meat was separated manually from those cooked fillets. The cutlet included cooked Pangasius meat, salt, oil, green chilies, coriander leaves, ginger, garlic, onions, cooked potatoes, pepper powder, clove powder, cinnamon

powder and turmeric powder purchased from the local market.

Firstly the fish meat was mixed with boiled potatoes, salt and turmeric powder and kept aside then chopped onions were fried in oil until brown and then mixed with green chillies, ginger and garlic paste followed by the powdered spices namely turmeric powder, clove powder, cinnamon powder and pepper powder, then mixed the meat with fried spices and cooked well.

The standard batter mix (Pagarka *et al.*, 2011) [3] was prepared using refined wheat flour, corn flour, salt, and turmeric powder which were mixed with water in a ratio of

1: 2 and blended to homogeneity.

Then cutlets of 30 gm weight were taken and flattened to 1cm thickness, dipped into standard batter mix rolled over breadcrumbs and fried in cooked oil till it becomes golden brown. Then, the fried cutlet was subjected to organoleptic evaluation by a group of students using 9 points hedonic scale (1-dislike extremely to 9-like extremely) (Rathod *et al.*, 2013) [7] on the attributes such as colour, taste, texture, aroma and overall acceptability. Proximate composition viz., moisture, crude protein, fats, carbohydrate and ash of raw fish and fish-cutlet were analysed according to AOAC (2005) [1].

Table 1: Recipe of fish cutlet

SI. No.	Ingredients	Quantity in gram
1	Cooked fish meat	100
2	Sable salt	3
3	Green chillies	5
4	Coriander leaves	5
5	Ginger	5
6	Garlic	5
7	Onion	25
8	Potato	70
9	Pepper powder	0.3
10	Clove power	0.3
11	Cinnamon powder	0.2
12	Turmeric power	0.2
13	Bread powder	20

Results and Discussions

For the preparation of cutlet, Pangasius fish (*P. hypophthalmus*) were selected due to high demand, easy availability and affordability. Fish was purchased from the local fish market, which may carry several microorganisms. To deal with this issue fish were washed multiple times with potable water to eliminate any chance of contamination. Fish head, gills, intestine and skin carries more spoilage bacteria. Therefore, all these (Gills, intestine and skin) were removed and fillets were selected to prepare cutlets. The

yield of fish fillets was 52%. Rathod *et al.* (2013) [7] also found a similar yield of Pangasius fillets.

Table 2: Proximate composition of Pangasius meat and fish-cutlet

Attribute (%)	Pangasius meat	Fish-cutlet
Moisture	75.65	52.25
Crude Protein	14.25	18.60
Fat	7.85	20.85
Carbohydrate	-	05.45
Ash	02.25	02.85

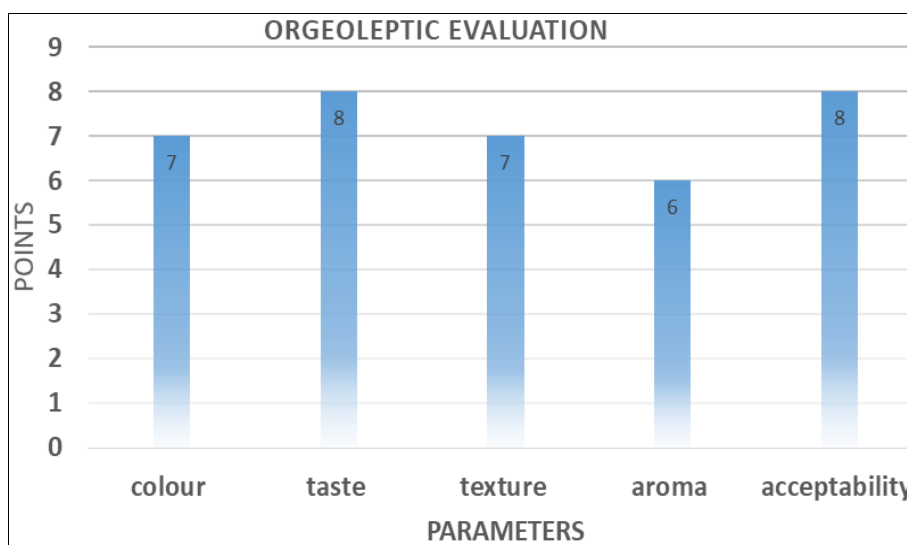


Fig 1: Orgaoleptic evaluation of fish-cutlet



Fig 2: Image of Pangasius fish-cutlet

The benefit of selecting the Pangasius fish over IMC (Indian Major Carp) is not having small bones, which makes it easier to prepare the cutlet and the chances of remaining the small bones in the cutlet get minimised. Which is good from a consumer safety point of view. The Pangasius fish comes under fatty fish, and this fat provides extra flavour to the cutlet which is good for consumer acceptability.

To easily obtain the meat from the fish, it was boiled in water for 20 minutes. Pawar (2011) [5] also used the boiling method to obtain meat for 30 min. 20 min of boiling was selected due to fresh and tendon meat quality.

Indian spices such as green chilies, coriander leaves, ginger, garlic, onions, pepper powder, clove powder, cinnamon powder and turmeric powder were selected since the cutlet was prepared for Indian consumers who are used to the taste of Indian spices.

The ratio of fish meat to potato was kept at 10:7. Higher amount of potato to meat increased starch content in the cutlet and bound all ingredients properly. A higher potato ratio reduces the cost of cutlet, however, too much potato can overcome the flavour of fish meat. Similar results with slight variation were also found by Pagarkar *et al.*, 2011 [3].

The batter mix was prepared using refined wheat flour and corn flour, which provides better binding capability and helps to coat the breadcrumbs evenly on the surface of the cutlet. This batter mix was referred by Pagarkar *et al.*, 2012 [4].

The shape of cutlets was round in shape with 30 gm weight and one cm thickness. The colour of the cooked cutlet was golden brown which gives the greater appeal.

The organoleptic evaluation of fish-cutlet was examined based on 9 points hedonic scale, in which fish-cutlet are given to people along with a hedonic scorecard. One to nine marks are given based on likes or dislikes. One mark is given when the evaluator extremely dislikes the dish and nine marks are given when extremely like the dish. Fish-cutlet prepared using Pangasius meat were served to ten

evaluators, who were selected randomly. The average of all the ten evaluators was taken and final results were prepared. The colour of fish-cutlet was golden brown, which got seven marks. Eight marks were obtained in the taste section, which shows that the taste of fish-cutlet was very liked by evaluators. The texture of fish-cutlet was crispy on the outside and soft on the inside. Aroma and overall acceptability also got good marks.

The moisture, crude protein, fats and ash contents of Pangasius fish meat were found to be 75.65%, 14.25%, 7.85% and 0.25% respectively (Table 2). Similarly, with slight variation was reported by Rathod *et al.*, (2013) [7] in moisture (76.6%), crude protein (14.37%), fat (6.76%) and ash (2.25%) contents in fresh Pangasius, whereas Orban *et al.* (2008) [2] reported the moisture (83.57%), crude protein (13.60%), fat (1.84%) and ash (1.25%) in fresh Pangasius fish. The variation in the proximate composition in Pangasius fish occurs due to the difference in environmental conditions and physiology of the fish. The fish chosen was the same, however, all fishes get the different physicochemical conditions of water, and the difference in the availability of food also affects the meat quality of an aquatic animal.

The moisture, crude protein, fats carbohydrate and ash contents of fish-cutlet were found to be 52.25%, 18.60%, 20.85%, 0.45 and 0.28% respectively (Table 2). The increase in fat and reduction of moisture content in cutlets is due to deep frying. Pawar (2011) [5] reported moisture, protein, fat and ash content in fried cutlets were 65.71%, 16.57%, 14.50% and 3.22% respectively.

Conclusion

Fish-cutlet was prepared using Pangasius fish. The cutlet had good consumer acceptance, with a golden-brown appearance. Therefore, it is to be suggested that cutlets should be prepared using Pangasius fish, which can enhance economic value as well as consumers will get a new flavour.

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