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ORGANOLEPTIC ANALYSIS AND DETERMINATION OF pH AND MOISTURE CONTENT IN ROHU, *Labeo rohita* AND CATLA, *Catla catla* FROM DIFFERENT FISH LANDING CENTERS DURING THE PRE AND POST - MONSOON PERIOD

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Author DL designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors FDS and MM managed the analyses of the study. Author MM managed the literature searches. All authors read and approved the final manuscript.

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Short Research Article

ABSTRACT

The present research work was carried out with an aim to determine the pH and moisture content status of Rohu, *Labeo rohita* and Catla, *Catla catla* fish after it was brought into the local market for sale. The study was carried out at three fish landing centers viz., Arnala (Palghar District), Malad (Mumbai) and Mumbai Central (Mumbai). The Organoleptic analysis was within the range of 4 – 6. According to the Organoleptic analysis the minimum score is 0 means the fish is very fresh while the score from 1 – 10 indicates that the fish is in acceptable condition. The pH readings from all the centers for the Pre and Post - monsoon period was 6 i.e. slightly acidic. According to the Food and Agricultural Products Research and Technology Center a freshly caught fresh water fish muscles pH ranges from 6.8 to 7.3. So, only a slight drop in the pH of the fresh water fish muscles from all the three fish landing centers during the Pre and Post - monsoon period is observed. This clearly indicates that the preservation and processing procedures were in place to increase the shelf life of fishes. Also the Moisture content was within the range of minimum to maximum 66 % to 74.62 % respectively. Moisture content in freshly caught fresh water fish is reported to be between 70 and 80% of the total weight. The fishes under study were within the acceptable and edible range of the consumer. Thus, this clearly states that, all the three fish landing centers viz., Arnala (Palghar District), Malad (Mumbai) and Mumbai Central (Mumbai) the fish preservation is practiced by fishermen and vendors.

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1. INTRODUCTION

Fish enjoys a very special position and place in human civilization from time immemorial. Its food, gastronomic, culinary and nutritional value, makes it demanding food stuff [1]. Many species of fish rank in the category of "gourmet par excellence". Today fish has become the staple food of people residing in the various interior parts of the country [2].

Once a fish is caught during fishing it has to be preserved properly because fish is a perishable product. A living fish flesh has a pH of 7.0. However, after death, residual glycogen is broken down via glycolysis to pyruvic acid and then lactic acid. As this happens, the flesh becomes more acidic. If the pH remains about 6.6, the texture is reasonably soft, but below this level, the flesh becomes firm and eventually unacceptably tough. Thus pH is a possible test of textural strength, with anything below 6.6 resulting in noticeably firmer flesh than that of fresh fish [3].

Muscles of fish contain proteins, lipid (fat), water, carbohydrate, mineral, organic matter, and nucleic acids, which vary for example, with species, muscle type, spawning. Fish is one of the most perishable food items. The muscle tissue of fish undergoes faster spoilage than any mammalian muscles. The high water i.e moisture content and free amino acid content and the lower content of connective tissue as compared to other flesh food leads to the more rapid spoilage of fish. The high moisture content promotes more bacterial growth and its activity. These extensive bacterial growth leads to rapid degradation of the fish muscles [4]. The Moisture content in a fresh Catla, *Catla catla* fish is between 73 - 74%, while that of Rohu, *Labeo rohita* is between 77 - 78% [5].

The present research work aims to determine the pH and moisture content status of Rohu, *Labeo rohita* and Catla, *Catla catla* fish after it is brought into the local market for sale. The organoleptic analysis is a rapid method to determine the freshness of fish and has also been used in the present study. The pH value, moisture content, and organoleptic analysis will indicate the freshness of fish and its palatability status.

2. MATERIALS AND METHODS

2.1 Materials

During the pre - monsoon and post - monsoon months the fish that is Rohu, *Labeo rohita* and Catla, *Catla catla* were collected from the fish market of Arnala in Palghar District, Malad and Mumbai Central in Mumbai. All these fish markets receive fresh fishes directly from the various fresh water resources. The fishes were collected and immediately preserved in ice and brought to the laboratory. Once the fishes were brought to the laboratory then immediately their organoleptic analysis was done. The fishes were then washed with distilled water and blood stains and mud spots were removed. The scales were removed with the help of sharp knife taking care that no damage was done to the skin. All the fins and the gut were removed. Once again the fish was washed with distilled water. Then with the help of the sharp knife, the fish was cut into steaks. These steaks were utilized for the analysis of pH and moisture content.

2.2 Methods

During the pre - monsoon and post - monsoon months the fish that is Rohu, *Labeo rohita* and Catla, *Catla catla* were collected from the fish market of Arnala in Palghar District, Malad, and Mumbai Central in Mumbai. During pre and post – monsoon months, the Organoleptic analysis and determination of pH and Moisture content was done on 3 fishes each of Rohu, *Labeo rohita* and Catla, *Catla catla* from each of the three fish landing centre. Rohu, *Labeo rohita* and Catla, *Catla catla* used for the study were adult fishes with weight between 1 – 1.5 Kg.

List 1: The procedure followed was as follows: -

Sr. No.	Parameter	Method
1	Organoleptic analysis	Quality Index Method (QIM)
2	pH	BDH indicator
3	Moisture content	Direct heating method

(A. D. Woyewoda et. al., 1986) [6]

3. RESULTS

According to the Organoleptic analysis, the minimum score is 0 means the fish is very fresh, while the score from 1 – 10 indicates that the fish is in acceptable condition and from 11 – 20 score indicates that the fish is unpalatable.

4. DISCUSSION AND CONCLUSION

In the present study, the Organoleptic analysis, pH, and Moisture Content study of Rohu, *Labeo rohita* and Catla, *Catla catla* from three fish landing centers viz., Arnala (Palghar District), Malad (Mumbai) and

Table 1. Organoleptic analysis, pH, and Moisture Content data of Rohu, *Labeo rohita* from different fish landing centers during the pre and post - monsoon period

	Post - Monsoon			Pre - Monsoon		
	Organoleptic analysis	**pH**	**Moisture content**	**Organoleptic analysis**	**pH**	**Moisture content**
Arnala (Palghar District)	4 ± 0.94	6 ± 0.45	69 % ± 0.89	5 ± 0.81	6 ± 0.45	67 % ± 1.24
Malad (Mumbai)	6 ± 0.93	6 ± 0.42	69 % ± 0.89	6 ± 0.82	6 ± 0.42	68 % ± 1.25
Mumbai Central (Mumbai)	6 ± 0.92	6 ± 0.47	67.11 % ± 1.05	4 ± 0.81	6 ± 0.47	65 % ± 1.37

Table 2. Organoleptic analysis, pH, and Moisture Content data of Catla, *Catla catla* from different fish landing centers during the pre and post - monsoon period

	Post - Monsoon			Pre - Monsoon		
	Organoleptic Analysis	**pH**	**Moisture Content**	**Organoleptic Analysis**	**pH**	**Moisture Content**
Arnala (Palghar District)	6 ± 0.81	6 ± 0.23	71.42 % ± 2.29	4 ± 0.94	6 ± 0.23	74.62 % ± 3.81
Malad (Mumbai)	4 ± 0.81	6 ± 0.23	66 % ± 2.34	6 ± 0.96	6 ± 0.23	69 % ± 3.80
Mumbai Central (Mumbai)	5 ± 0.82	6 ± 0.24	70 % ± 2.45	4 ± 0.93	6 ± 0.24	65.35 % ± 3.77

Mumbai Central (Mumbai) was done during the Pre and Post - monsoon period. The Organoleptic analysis was within the range of 4 – 6. According to the Organoleptic analysis, the minimum score is 0 means the fish is very fresh while the score from 1 – 10 indicates that the fish is in the acceptable condition. Thus as per the Organoleptic analysis, the fish were in acceptable and edible condition. The pH readings from all the centers for the Pre and Post - monsoon period was 6 i.e. slightly acidic. According to the Food and Agricultural Products Research and Technology Center [7] a freshly caught freshwater fish muscles pH ranges from 6.8 to 7.3. So only a slight drop in the pH of the fresh water fish muscles from all the three fish landing centre during the Pre and Post - monsoon period is observed. This clearly indicates that the preservation and processing techniques were in place to increase the shelf life of fishes. Also, the Moisture content was within the range of minimum to maximum 66 % to 74.62 % respectively. Moisture content in freshly caught fresh water fish is reported to be between 70 and 80% of the total weight [8]. So the Moisture content in the Rohu, *Labeo rohita* and Catla, *Catla catla* from all the three fish landing centers lie within the range with a small fall in the moisture content observed during some period. Taking into consideration that the fishes Rohu, *Labeo rohita* and Catla, *Catla catla* under study from all the three fish landing centers were not freshly caught but were preserved properly in order to prevent the deterioration of fish quality. The fishes under study were within the acceptable and edible range of the consumer. Thus this clearly states that at all the three fish landing centers viz., Arnala (Palghar District), Malad (Mumbai), and Mumbai Central (Mumbai) fish preservation is practiced by fishermen and vendors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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