



Standardisation of Recipe for Batter and Breaded Product Acetes Cutlet from Jawala (*Acetes indicus*)

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Acetes is a small sized shrimp, locally known as 'Jawala' or 'Kolim' is landed along the north-west coast in the states of Gujarat and Maharashtra, India. At present the fresh utilization of Acetes is very limited. One of the most important food product is battered and breaded product. A standardized recipe of batter and breaded Acetes product is mentioned in the paper. Acetes cutlet having a standard size of 5 cm diameter, 1 cm thickness and 30 g weight Acetes cutlets were standardized by using different ingredients viz., cooked potatoes, salt, green chilly and ginger (CG). Prepared of cutlets were standardized by organoleptic valuation. It was found that, Acetes cutlet prepared with the ratio of 75:100 (w/w), 20:100 (w/w), 5.5:100 (w/w), 5.5:100 (w/w) and 2.5:100 (w/w) for potato: Acetes mince, onion: Acetes mince, green chilly: Acetes mince, ginger: Acetes mince and table salt: Acetes mince respectively, ratios showed highest score as compared to other ratios tried in the experiments.

Keywords : Acetes, batter and breaded product, ingredients, sensory evaluation, value added products

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India has a coastline of 7517 km covering 9 states and 3 union territories. India's marine fish catch has increased by 5.6% (3.83 MT) and 8.3% (Rs. 52431 crores) in 2017 for catch (landing) and value respectively. Demand for fish and fish products has been growing steadily over the past years for a variety of reasons including, a rise in living standards, a greater variety of seafood available compared to other meats, more affordable pricing and growing awareness of fish as an alternative form of healthy foodstuff, due to omega-3 fatty acid and high-quality amino acid. A wide range of fish and fish added products are available for domestic as well as export market due to recent development in fish processing technology *i.e.*, whole frozen fish, fillets, mince and value-added products.

TABLE 10

Batter and Breaded Products: A Need for Low Cost Fish Utilization

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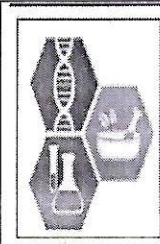
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In recent scenario there is a rapid increase in production as well as consumption of fast foods. Urbanization

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Effect of washing processes on quality parameters of surimi prepared from Lesser sardine (*Sardinella* spp.)

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Abstract

Lesser sardine (*Sardinella* spp.) is one of the pelagic shoaling fish mainly landed in huge quantity at Ratnagiri coast. These species of fish have high percent of fat and myoglobin, which effects the quality of surimi produced. The gel strength characteristic of surimi can be improved by using different washing processes. The gel strength characteristic plays important role in preparation of crab/lobsters analogues and other surimi based products. Effect of washing processes viz., conventional washing process (CWP) and alkaline-saline washing process (ASWP) on surimi was compared with unwashed mince (UWM) prepared from Lesser sardine. In the present investigation, surimi were analysed for parameters like gel strength, whiteness, expressible moisture, pH, solubility and organoleptic characteristics. Gels strength of unwashed mince (UWM) and different washing processes like CWP and ASWP were depicted as 28.67, 42.00 and 68.00 g/cm respectively. High values of whiteness and pH with decreasing expressible moisture content was observed in ASWP as compared to others. The results showed that alkaline-saline washing process (ASWP) could improve the gel forming ability of surimi particularly from low quality fatty fish (*Sardinella* spp.).

Keywords: Lesser sardine, washing processes, surimi, gels strength, quality improvement

1. Introduction

Surimi is deboned, washed and stabilized fish mince containing myofibrillar protein added with cryoprotectants and frozen [18]. Surimi is basic raw material for development of various value added products such as crab analogues, scallop analogues, shrimp/lobster analogue, fish ball and other surimi based products. These products have excellent nutritional values and they are available in ready to eat and ready to cook, convenient products to the consumers [25, 24]. Consumer's health can be potentially improved by consumption of health-promoting seafood products. These products have good demand in national and international market [23]. Lean fishes are generally used for surimi production. Presently, the catch of lean fishes from sea is declining due to over exploitation of these fishes and there is urgent need to utilize fatty pelagic fishes for surimi production. Lesser sardine (*Sardinella* spp.) are pelagic, fatty, shoaling fishes, which are landed in huge quantity on Ratnagiri coast of India. These fatty fishes need to be used for the production of surimi for its better utilization. However, problems faced with production of surimi from these fatty fish species, such as Lesser sardine (*Sardinella* spp.) are dark muscle associated with high content of lipid and myoglobin, resulting difficulties in making high quality surimi [11, 14]. The washing technique is used as an important tool to improve the quality of surimi. A huge amount of water is used to remove the water-soluble proteins, blood, fat and other nitrogenous compounds from the minced fish flesh [16].

Washing process shows great significance on final quality of the surimi, which removes sarcoplasmic protein and increases the concentration of the myofibrillar proteins. This increase in myofibrillar proteins improves the ability to gel formation [19, 5]. However, no information is available on effect of washing processes on surimi quality such as, colour, gel strength and other properties from species Lesser sardine (*Sardinella* spp.) caught from Ratnagiri coast. Therefore, in the present study the effect of Lesser sardine surimi prepared from conventional washing processes (CWP) and alkaline saline washing processes (ASWP) compared with unwashed mince and its functional and other gel properties were studied.

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ABSTRACT

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KEY WORDS: ACETES, BATTER AND BREADED PRODUCT, INGREDIENTS, SENSORY EVALUATION, VALUE ADDED PRODUCTS

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MODIFIED ATMOSPHERE PACKAGING : AN APPROACH TO SEAFOOD INDUSTRY

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ABSTRACT : Demand for fresh or minimum processed seafood is increasing in national and international market. The increasing demand for high quality fresh seafood has intensified the search for methods and technologies for better fish utilization. Packaging is an essential requirement virtually for every product, whether it is a food or any manufactured item. The packaging of food and food products and particularly fish, is very complex because of the intrinsic characteristics of such products and the need to retain or preserve them while in the package. Extending the shelf life of fresh fish and seafood such as shrimp and prawn is a particular challenge because of the unique nature of the product. There are many types of fish that have different characteristics and therefore different requirements for packaging. The flesh of fish and shellfish contains more water and protein. Bacteria present in the gut, gills and body surface of fish begin to act on the protein of the tissue every quickly. Active enzymes in the flesh and gut also degrade the tissue. Fish that have a high content of unsaturated fat, such as herring and mackerel, are also susceptible to oxidation by the air resulting in rancidity. Modified atmosphere packaging (MAP) is a technologically viable method developed as a supplement to ice or mechanical refrigeration to reduce quality losses or spoilage and extend the storage life. MAP enables the fresh produce or perishable product to be packaged when it is fresh and then maintains it in that condition, thereby, reducing distribution costs, and enhancing quality and appearance for the consumer. MAP maintains this state for along period of time, during which deterioration is effectively stopped. The application MAP in seafood processing industry is discussed in this paper.

Key words : Fish products, modified atmosphere packaging, shelf life, seafood packaging.

INTRODUCTION

Packaging is an external means of preservation of a product from spoilage, damage or loss due to external causes. Packaging material may help to further extend the shelf life of the product. Food packaging has developed strongly during recent years, mainly due to increased demands on product safety, shelf life extension, cost-efficiency, environmental issues and consumer convenience. In order to improve the performance of packaging in meeting these varied demands, innovative modified, and controlled atmosphere packaging, and active and intelligent packaging systems are being developed, tested and optimised in laboratories around the world.

Recent survey showed that busy consumers are more

and more seeking quick and easy to prepare, ready to cook, fresh chilled or frozen pre-packed fish products. Demand for home consumption products is heavily influenced by the limited time available for meal preparation in today's busy lifestyles. Furthermore, coupled with economic, social influence and lifestyle choices in terms of disposable income, an increasing number of consumers are moving toward healthier semi-processed refrigerated pre-packed options (Pacqui *et al.*, 2008). Demands for seafood increased due to awareness of the health benefits of seafood i.e. high-protein, low-fat and high omega-3 fatty acids. One of the major developments in food packaging (for fulfilling new challenges) is packaging under vacuum or modified



Modified Atmosphere Packaging : An Approach to Seafood Industry

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Demand for fresh or minimum processed seafood is increasing in national and international market. The increasing demand for high quality fresh seafood has intensified the search for methods and technologies for better fish utilization. Packaging is an essential requirement virtually for every product, whether it is a food or any manufactured item. The packaging of food and food products, and particularly fish, is very complex because of the intrinsic characteristics of such products and the need to retain or preserve them while in the package. Extending the shelf life of fresh fish and seafood such as shrimp and prawn is a particular challenge because of the unique nature of the product. There are many types of fish that have different characteristics and therefore different requirements for packaging. The flesh of fish and shellfish contains more water and protein. Bacteria present in the gut, gills and body surface of fish begin to act on the protein of the tissue very quickly. Active enzymes in the flesh and gut also degrade the tissue. Fish that have a high content of unsaturated fat, such as herring and mackerel, are also susceptible to oxidation by the air resulting in rancidity. Modified Atmosphere Packaging (MAP) is a technologically viable method developed as a supplement to ice or mechanical refrigeration to reduce these losses or spoilage and extend the storage life. MAP enables the fresh produce or perishable product to be packaged when it is fresh and then maintains it in that condition, thereby, reducing distribution costs and enhancing quality and appearance for the consumer. MAP maintains this state for a long period of time, during which deterioration is effectively stopped. The application MAP in seafood processing industry is discussed in this paper.

Keywords : Fish products, modified atmosphere packaging, shelf life, seafood packaging

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Effect of Nutritional Quality on Frozen Stored Surimi Prepared from Lesser Sardine (*Sardinella* spp.) Added with Different Natural Phenolic Compounds

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Fish is a good source of high quality proteins and fats as well as vitamins and minerals. It is healthy food, easy to digest. Quality seafood like lobsters, shrimps, crabs etc. have more demand in national and international market. Catch of these quality seafoods are decline from nature resources due over exploitation. Imitated seafood is one of the important tool to meet market demand of these valued seafoods by utilization of under-utilized, low valued fishes. Surimi is a base material prepared from low valued fish that have been washed, dressed, minced, again washed several times, strained, pressed, mixed with cryoprotectants, packaged and quick frozen usually in some block form. The inherent value of surimi is its unique texture forming properties that makes it an excellent base for manufacturing a variety of value added seafood products like lobster/crab analogue, crab bites, shrimp analogue, fish ball, kamaboko etc. Surimi is active in performing the functions of texture formation or particle cohesion and binding of fat and water in many processed muscle food systems. These textural properties of fish surimi was increase using natural extract of phenolic compounds from seaweed and mango leaves. The prepared surimi of Lesser sardine (containing 4% sugar and 0.2% polyphosphates cryoprotectants) chopped and mixed separately with 2% of seaweed extract (T1), 2.5% of mango leaves extract (T2) then frozen at -40°C and stored at -20°C. Surimi without phenolic extract served as control (T0). The frozen stored these surimi samples were drawn periodically and assessed for nutritional quality. The salient features of change in proximate quality are discussed in the paper.

Keywords : Surimi, functional properties, plant extract, phenolic compounds, lobster/crab analogue

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