Preparation of Fish Pickle for Improving Community Nutritional Status

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ABSTRACT

This study investigates the development of a nutrient-rich fish pickle using Crocker fish (Mushka) as an affordable protein source. The process involved traditional pickling techniques, emphasizing preservation and enhance nutritional value. The pickle was prepared by marinating the fish with spices and mustard oil followed by a storage in glass jars to evaluate its stability and quality. Physiochemical analysis revealed low pH (3.52) essential for microbial inhibition and extended shelf life. The pickle contain 18.9% protein, 6.6% ash, 6.0% moisture and 2.82% lipid content indicating its richness in macronutrients and minerals. Sensory evaluations related it highly for taste texture, and over all acceptibility. The oxidative stability remained with an acceptable limits over 15 days, ensuring product safety and quality. This research highlights fish pickles potential as functional food, combining high protein, essential minerals and omega-3s. It offers a sustainable solution for malnutrition, supporting dietary diversity and community health, particularly in resource-constraint settings.

Keywords: Antioxidant, Croaker, High Protein, Mustard Oil, Shelf Life, Traditional.

INTRODUCTION

The traditional technique of pickling has long been used to preserve foods like fruits, vegetables, fish, and meat. Picking not only enhancers flavour, texture, and colour but also improves the safety and nutritional value of foods. Fermented pickles are particularly valued for their nutritional and medicinal benefits, as well as their economic potential (Behera *et al*., 2020). This review covers advancement in traditional pickle processing, microbial screening, and biofortification to enhance quality. Pickling creates and acidic environment (pH below 4.0), which preserves fish safely by inhibiting pathogenic bacteria, thus extending shelf life (Rockridge Press, 2015). Fish pickles especially those made with nutrient rich Mushka fish become popular for their protein, vitamins, and Omega-3 content, potentially addressing malnutrition. This study will examine biochemical and microbial changes in Croaker fish pickle during storage, providing essential insight into optimal processing and storage for high-quality, sustainable products (Khan *et al*., 2012).

OBJECTIVE

To develop a nutrient-rich fish pickle from locally available fish as a cost effective, sustainable and affordable protein source.

METHODOLOGY

Fresh croaker fish was cut into elongated cutlets, washed, and salted for 1 hour, then rinsed and frozen overnight. The next day, vinegar was applied to the deodorized the fish for 15 minutes, rinsed off, and the fish was coated with all-purpose and gram flour, set for 15 minutes, rinsed and refrozen. After odor removal, the fish was marinated with garlic paste, red chilli powder, turmeric, salt, mustard powder, and lemon juice for 24 hours then deep-fried in mustard oil until tender and crispy. For pickle preparation, carrot and coriander, cumin, were added along with roasted and ground spices including fennel, coriander, cumin, mustard, rye, red chilli, kalongi and methi dana. The mixture was combined with 1 kilogram of mustard oil and gently mixed with

fried fish and vegetables. The mixture was stored in glass jars, with two batches prepared and placed in sunlight for preservation and further evaluation (Rao *et al*., 1958).

RESULT

The proximate analysis shows the pickle's pH at 3.52, crucial for storage stability by inhibiting microbial growth, thereby extending shelf life as presented in Table **1**. Total titratable acidity is 0.00576, giving a salty and sour profile due to likely lactic acid. The pickle's composition includes 6.6% ash, 6.07% moisture, 1.75% salt, and 1.5% acidity, reflecting mineral content from fish or additives. Protein is 18.9%, with fish providing rich macronutrients mentioned in Table **2**, while lipid content is 2.82 ml per 15 g. Initial peroxide value of 0.27±0.08 meq/kg to 2.43±1.46 meq/kg over 15 days as shown in Table **3**, showing stable oxidative quality. These findings confirm the croaker pickle's low moisture, saltiness, sourness, and low pH profile, key for preservation. Mushka fish (Croaker), with its dense texture and nutrient richness, enhances quality. High protein boosts nutrition, flavor, and mouthfeel shown in Table **4**. Croaker fish also supplies essential minerals and omega-3s, positioning the pickle as a functional food. Its low pH and protein content further support stability, making it a nutritious, shelf-stable product.

Table 1. Physiochemical Analysis of Fish Pickle.

Attributes	Result
pH	4.89
Titrable Acidity	0.00576%
Salt Content	1.75%
Acidity/ Acid Content	1.5%

Table 2. Proximate Analysis of Fish Pickle.

Protein Content	18.89%
Lipid Content	2.82 ml
Moisture Content	6.07%
Ash Content	6.6%

Table 3. Oxidative Stability / Assessment of Fish Pickle.

Days	Peroxide Value (Unit)
0	0.27±0.08 meq/kg of Oil
15	2.43±1.46 meq/kg of Oil

Table 4. Sensory Evaluation of Fish Pickle.

Color	Taste	Aroma	Texture	Overall Acceptability
9	9	9	9	9

CONCLUSION

The study developed a nutrient-rich fish pickle using Croaker fish, emphasizing affordability, extended shelf life, and high nutritional value. Containing 18.9% protein and essential minerals, it serve as a functional food with omega-3s. Sensory and physiochemical analysis confirmed its quality, stability, and acceptability, offering a sustainable solution to malnutrition in resource limited communities.

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