

Technological Studies on Tiger Nut in Egypt and Nigeria

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THESIS

**Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Biotechnology**

In

AFRICAN STUDIES

Natural Resources (Plant Resources)

“Food Science”

**Department of Natural Resources,
Faculty of African Postgraduate Studies,
Cairo University
EGYPT**

2020

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Degree: M.Sc.

Title of Thesis:Technological Studies on Tiger Nut in Egypt and Nigeria

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Approval: / / 2020

ABSTRACT

The purpose of this study is to study the nutritional value of tiger nut tubers and their products. Tiger nut tubers (*Cyperus esculentus* L.) cultivar were collected from Tanta City, Tanta Governorate, Egypt. The chemical composition and mineral analysis of tiger nut the tubers were determined. Extraction of oil and determined of some physico-chemical properties of extracted oil and identification of fatty acids composition (%) by gas liquid chromatography (GC). Also, amino acids in tiger nut flour by amino acid analyzer. Tiger nut coated with chocolate was prepared from tiger nut tubers and sensory attributes were determined as compared with commercial peanut coated with chocolate (commercial samples). Preparation of tiger nut milk was processed in lap. Some chemical composition and sensory evaluation of milk made from tiger nut was determined compared with soymilk as a control and microbial content of tiger nut milk. Substituted wheat flour with tiger nut flour at varying proportions (100:0; 90:10; 80:20; 70:30; 60:40; 50:50) was evaluated for proximate composition of flour mixtures, fermentation time test (pelshenke test) and estimate the some physical properties of the produced biscuit. The obtained data indicated that the protein, ash and crude fiber contents of tiger nut tubers were 5.08%, 2.23% and 14.80% respectively. The highest ratios in chemical composition of tiger nut tubers is carbohydrates (45.73%) followed by oil content 30.01% (dry weight) and moisture content (8.50%). Tiger nut tubers are rich in Ca (152.00 ppm), P (141.00 ppm) and Na (150 ppm). Moreover, tiger nut tubers are a good source of total amino acids. Amino acid profiles were dominated by, arginine acid followed by glutamic acid, aspartic, alanine and Leucine. It is remarkable that the tiger nut and olive oils are similar in fatty acids composition. Tiger nut and olive oils contained palmitic acid as the main saturated acid and oleic acid as the predominant unsaturated fatty acids. In conclusion, the results obtained show that preparation of tiger nut coated with chocolate was cheaper. Soy bean milk commercial (A), soy bean milk lab (B) tiger nut milk (C) were evaluated for their proximate composition. The oil, crude fiber contents and pH were highest in tiger nut milk. Conversely, there were lowest amounts of protein, carbohydrate and moisture in tiger nut milk. Growth throughout the storage period. The bacterial and fungal growth at zero time of milk storage was not higher than 10^3 cfu/ml; however, the samples stored zero time, 7 and 14 days under ambient condition had 10^5 cfu/ml. The microbial status of the samples revealed that the different storage conditions (refrigeration and ambient storage) affected the quality of beverages differently; All the samples had high moisture content which ranged from 63.58 to 82.20 %. Significant difference ($p < 0.05$) existed in sensory scores of mouth feel, color and aroma, but there was no significant ($p > 0.05$) difference in taste and overall acceptability; although all the samples were generally accepted in terms of sensory quality. It was found that composite flour used to produce biscuit is still able to maintain similar characteristics to product made from full-wheat flour. The positive effects of the use of composite flour can be seen in the final product related to the physical and sensory properties.

Key words: Tiger nut tubers, proximate analysis, tiger nut oils, minerals, amino acids, tiger nut tubers with chocolate, tiger-nut milk, biscuit, sensory properties.