EFFECT OF IONIZING IRRADIATION ON TILAPIA (*OREOCHROMIS NILOTICUS*) SKIN

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The culture of tropical tilapia (*Oreochomis niloticus*), as a non-native freshwater fish specie in Brazil, have had importance in the last decade due its fast growing, fast reproduction characteristics, high tolerance of climate variations in our country and high disease resistance. The high demand of whole fish or fillets is related to its good taste. Althought, its skin, that represents from 4.5 % to14 % of fish weight, is a byproduct that is generally discared or sold at low cost to feed mills. The general animal skin composition comprises protein, water, minerals and fatty matter where the relative portions of these materials depends of upon animal specie, age, breed, feeding and other animal habits. The putrecible raw animal skins can be chemically and physically treated to make it in non-putrecible stabilized material; it results in a soft and flexible polymeric material. The chemical process to obtain this material generally involves a crosslinking of carboxyl groups or amino groups of skin proteins and the chemical reactive specie [1]. Also, physical process as UV irradiation have been successfully employed to crosslink collagenous biomaterials and thus, improved some mechanical characteristics [2].

The goal of this work was to study the tilapia skins exposed to ionizing irradiation from electron beams. The raw skins and the chemically degreased skins were the studied materials. The tensile strenght and elongation at break were the mechanical parameters evaluated. The optical microscopy was used to evaluate some histological characteristics in irradiated and non-irradiated samples. Also, the polymeric product obtained when skins are treated with oxidizing ions were used to compare some results.

The tilapia raw skins were kindly available by APTA, a governmental agribusiness technological agency. These skins were scales free, slighted and frosted. The skins were irradiated in atmosphere air on a Job 188 Dynamitron® Electron Beam Accelerator with 1.5 MeV energy under comprised doses of 20 kGy and 40 kGy and dose rates of 2.2 kGy/s and 7.4 kGy/s. The mechanical parameters were measured at a Lloyd LXR tensile tester at a crosshead speed of 10.00 mm/min.

Irradiated samples shows high integrity and high tensile strength in comparison to the polymeric product obtained by oxidizing ions reaction. These results are discussed.

1. *Knott L, Tarlton JF, Baylei AJ, (1997) Chemistry of collagen crosslinking: biochemical changes in collagen during the partial mineralization of turkey leg tendon. Biochemistry Journal 322:535−542*
2. *Weadock KS, Miller EJ, Bellincampi LD, Zawadsky JP, Dunn MG, (1995) Physical crosslinking of collagen fibers: comparison of ultraviolet irradiation and dehydrothermal treatment. Journal of Biomedical Materials Research 29;11:1373-1379*