Effect of ionizing radiation on the color of featherwork

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Abstract

Featherwork collections are usually stored and managed by ethnographic museums. Even though the featherwork manufacturing is still practiced by the indigenous communities, the offer of raw material and the contact with the surrounding society ended up reducing the production scale of such objects.
Consequently, the preservation of the culture heritage is very important, particularly in museums. Biodegradation can affect featherworks mainly by xylophagous insects and moths' action. The tropical Brazilian weather contributes to the contamination and proliferation of insects and fungi making the preservation conditions difficult. The use of gamma radiation for the disinfection of cultural heritage objects and archived materials has shown to be a safe process and an excellent alternative to traditional methods usually involving high persistent and toxic chemical pesticides. In this work are presented the preliminary results of the ionizing radiation effects on the color and morphological properties of a featherwork from the Museum of Archeology and Ethnology of the University of São Paulo (MAE/USP). Samples of feathers were selected from the artifact and irradiated with gamma rays at the Multipurpose Gamma Irradiation Facility at IPEN, applying absorbed doses between 0.5 kGy to 200 kGy. Samples were firstly chosen according to feather colors, photographed and analyzed using colorimetry with CIELAB 1976 color space scale and scanning electron microscopy (SEM), just after and 48 hours after the irradiation process. The results shown had no significant changes on color and morphological properties within the disinfection absorbed dose range applied.