ACHARYA INSTITUTE OF TECHNOLOGY, BANGALORE

A Project Report on

"PREPARATION OF CHITIN NANO COMPOSITE FILM FROM MUSHROOMS AND EVALUATING ITS COMPATIBILITY FOR PACKAGING FRESH FRUITS"

SUBMITTED TO
KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

UNDER
STUDENT PROJECT PROGRAMME

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2012-2013

ABSTRACT

Mushroom has been valued throughout the world as source of both food and medicine for thousands of years. Present study has focused on the edible mushrooms, *Pleurotus ostreatus* and *Agaricus bisporus*. Preparation of chitin nanofibers from the mushrooms was made in the first phase. Second phase of the project involved preparation of nano composite film from the extracted chitin nanofibers. Chitin nanofibers were prepared from both the mushrooms by acid hydrolysis method after the removal of contaminating proteins and other minerals. Thickness, length and surface characteristics were assessed through SEM. Size of the nanofibers ranged from 50-200nm in length and ~11nm of width. Composite film of chitin nanofibers was prepared in combination with graphene oxide. Graphene oxide was prepared from graphite powder by modified Hummer's method. Chitin- Starch- Graphene oxide nano composite film was prepared by casting/ solvent evaporation method where sorbitol was added as a plastifier. Surface characteristics were assessed through SEM. The nano composite film showed the intercalation of chitin nanofibers within the matrix of graphene oxide-starch layer. These films were coated on fresh fruits (grapes) to test the preservation property of the nano composite film. At the end of 4 days period the treated fruits remained fresh and intact under room temperature while untreated fruits showed signs of deterioration. The study has standardized the techniques for isolation of chitin nano fibers from mushrooms and preparation of chitin-starch-graphene oxide composite film and efficacy of the composite film in storage of fruits. Validation of these results using non-edible mushrooms needs to be carried out for practical application of the findings.

Key words: Mushrooms, chitin nano fibers, nano composite film, grapheme oxide, preservation, fresh fruits, SEM