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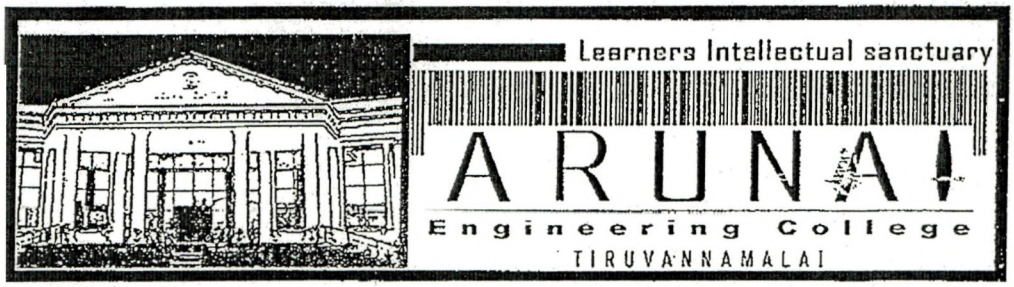

NA02

Antioxidant, Antidiarrhoeal & Anticancerous Effect of Nanocoated Food Packages *(Glycyrrhiza glabra)*

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The commonly used polycarbonate bottles contain Bisphenol A (BPA). Exposure to BPA causes cancer and mimics the hormonal system in pregnant women and children. Only recently, the polycarbonate bottles are banned, in India. As an alternate to BPA, Polypropylene (PP) is used in baby bottles, drinking straws and microwavable wares. The major chemical migrants in PP namely, Octa decyl 3(3-5 di-tert-butyl-4-hydroxy phenyl) and propionate/ Iganox 1076 are known to cause cancer of liver, kidney and lungs in experimental animals. Hence the present study was conducted to synthesize a protective coating from four medicinal plants, of which *Glycyrrhiza glabra* was found to possess the highest antioxidant, antimicrobial and anticancer properties. The particle size, zeta potential and EDAX of nanoparticles from *Glycyrrhiza glabra* were 34.7nm, -24.7mV and 2.60

percent of silver respectively. These properties along with the phytochemicals, augmented the chelating and antimicrobial potentialities of the plant extract. Thin layer chromatography of *Glycyrrhiza glabra* showed the presence of phenolic compounds and antioxidant activity of 520 µg. FTIR results revealed chlorohexidine salts peaks at 1157 cm^{-1}, which indicate breaking up of lipopolysaccharide. Chlorohexidine is a cationic biocide that damages the outer membrane of gram negative bacteria. Secondly the peak 1442.72 cm^{-1} corresponds to C=O stretch which shows remarkable intensity changes, revealing better antimicrobial potentials of the encapsulated nanoparticle compared to the raw plant extract. The GC/MS identified the following compounds namely tetradecanoic acid, Z, Z 2,5 pentadecadiene-1-ol, cis-9,10 epoxy octadecan-1-ol, 9 octadecenal and hexadecanoic acid. Hence, *Glycyrrhiza glabra* nanoparticles were coated onto the feeding bottles and the foods stored in them were tested for their shelf-life for three hours. Nano coats of Glycyrrhiza glabra were also tested on pet bottles and ziplock covers and foods tested over 10 days. Milk stored in feeding bottles recorded a maximum microbial inhibition of 84 percentage and diluted lemon juice showed no microbial growth of *S.dysenteriae*. On 10^{th} day, nanocoated zip lock covers and PET bottles showed a maximum microbial inhibition of 38, 63 and 83 percent and 57, 68 and 88 percentage against *E.coli(MTCC 40), S.enterica (MTCC 3219) and S.dysenteriae (PSGIMS & R)* respectively. The MTT assay of *Glycyrrhiza glabra* nanoparticles showed a maximum apoptosis of 50 and 48 percent against Hela and liver carcinoma cell lines respectively. The gel electrophoresis has led to a longer tail DNA damages with the Hela and carcinoma cell lines, compared to the control and marker. Therefore, nanocoats of *Glycyrrhiza glabra* could be used for effective protection against oxidative damage, diarrhea and cancer.

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