

ABSTRACT

Amla is known for its antioxidant properties for last 3500 years. The antioxidant property is attributed due to the presence of polyphenolic content. The application of antioxidants derived from amla in food is not widely reported hence in present investigation the extract of amla were incorporated in biodegradable alginate films and its effect on the physiochemical properties of films were evaluated. The alginate film containing amla extract were also applied as active packaging on butter and its effect on stability of fat were evaluated. The amla were extracted for its phenolic content with three different concentration of ethanol. 90% concentration was observed comparatively more effective for the total recovery of phenolic content than to other concentration tested. So that 90% concentration of ethanol was used for the extraction of TPC for further investigation. Alginate films of three thickness (0.20, 0.25 and 0.3 mm) was initially developed and were analyzed for its light barrier property. Film of 0.2 mm thickness showed comparatively less barrier properties than to other thickness tested and hence discarded for further studies. Amla extract was incorporated in alginate biodegradable film in 3 different levels i.e. 5%, 7.5% & 10%. On addition of Amla, moisture content of film decreases while, solubility in water increases both at 25°C & 80°C significantly. As level of extract in film increases from 5 to 10% the swelling ratio of film also decreases accordingly. Swelling ratio of film containing extract was significantly low than to the control. Film containing 10% extract had 15.13 of transparency whereas control film had 9.64 for same thickness at 250 nm suggested that film containing extract had better protection against UV light. The incorporation of extract significantly affected the light barrier properties of film at 250 and 450 nm. Extract showed significant effect on tensile properties of film which were gradually decreased while increasing the level of extract. Alginate film containing 10% amla extract was found significantly effective for the retardation of oxidation of free fatty acids in terms of peroxide and free fatty acid content of butter at both room temperature and refrigeration temperature at 5% probability level in comparison control. These results revealed that amla extract has good potential to be incorporated into alginate to make antioxidants biodegradable film and will be effective to protect against oxidation induced by UV light.