

Purification, characterization and utilization of polysaccharide of Araucaria heterophylla gum for the synthesis of curcumin loaded nanocarrier

ABSTRACT

In this study, gum of Araucaria heterophylla was collected. The collected gum was subjected for extraction of polysaccharide using solvent extraction system. Thus, extracted polysaccharide was further purified using solvent method and was characterized using UVVis spectroscopy, Phenol sulfuric acid assay, FTIR, TGA, TLC and GC-MS. The gum derived polysaccharide was found to have the following sugars Rhamnose, Allose, Glucosinolate, Threose, Idosan, Galactose and Arabinose. The extracted polysaccharide was tested for various in-vitro bioactive studies such as antibacterial activity, antioxidant activity and anticancer activity. The polysaccharide was found to have antioxidant and anticancer activity. Further, the polysaccharide was subjected for carboxymethylation to favor the nanocarrier synthesis, where it was chelated using Sodium Tri Meta Phosphate (STMP) to form nanocarriers. The nanocarriers so formed were loaded with curcumin and were characterized using FTIR, SEM, EDX and AFM. Both the loaded and unloaded nanocarriers were studied for its in-vitro cytotoxic effect against the MCF7 human breast cancer cell lines. The nanocarriers were found to deliver the drug efficiently against the cancer cell line used in this study.

Keyword: Araucaria heterophylla; Polysaccharide; Carboxymethylation; Nanocarrier; Anticancer activity