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*Extended Abstract*

# Isolation and Characterization of Kefiran Exopolysaccharides from Romanian Kefir Grains †

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Kefiran is the water-soluble branched glucogalactan from kefir grains and it contains D-galactose and D-glucose units in approximately equal quantities [1]. These bacterial exopolysaccharides, because of their status as probiotics for the bacteria that generated them, will become a category of biopolymers that offer new perspectives in the development of products with health and safety benefits [2]. The aim of our study was to obtain kefiran from a Romanian kefir artisanal culture and to characterize it physicochemically and biologically, in order to evaluate its potential as a nutraceutical.

The extraction of kefiran was performed by alcohol precipitation and the evaluation of the total carbohydrates and hexoses content was done by spectrophotometric methods, while the major carbohydrates were identified by 1H-NMR, and glucose and galactose were quantified by HPLC methods. Structural observations on kefiran extract were performed by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Cytotoxicity and anti-tumoral activity were tested with normal fibroblasts (NCTC clone L929) and epithelial tumoral (HT-29) cell cultures, cultivated in the presence of kefiran, in standard conditions, for 24 and 72 h.

Structural analyses revealed that the kefiran is composed of a hexasaccharide repeating unit, sugar composition analysis confirmed the previously reported values [3]. Ultrastructural and morphological analysis showed a fibrillar structure of kefiran (by TEM) and a compact structure with a homogenous matrix and smooth surface (by SEM), specific to polymeric materials. In the presence of kefiran concentrations ranging from 50 to 2700 mg/L, an antitumoral effect was observed at 72 h, while the cytotoxic effect was registered for concentrations that exceeded 500 mg/L.

These results demonstrated that kefiran extract presented valuable properties and confirmed its potential use in nutraceutical and biological applications.

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