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Physicochemical characterization of psyllium fiber

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ABSTRACT

Psyllium is the common name used for several members of the plant genus *Plantago*, whose seeds are commercially used for mucilage production. Owing to its considerable fiber amount it has been used as dietary fiber supplement. Psyllium has a strong gelling ability, even at low temperature, enabling its use as a gelling agent in the food industry.

This work is part of a project to developing jellies enriched with fiber, honey and propolis, aiming to increase these products intake, with evident health benefits.

The chemical characterization of psyllium was performed, with the following results (in dry matter): total ash 2.5%, fat content 3.4% and total protein 1.4%. After qualitative acid hydrolysis polymeric sugars were quantified (in dry matter): glucan 7.3%, xylan 61.1% and arabinan 22.9%. This means that total fiber content is about 90%, being soluble fiber predominant, and allows classifying psyllium hemicellulose as an arabinoxylan.

Psyllium functional properties were evaluated by water-binding capacity and swelling determination: 27.1 g/g and 36.9 ml/g, respectively. These properties are important in the food industry, but under certain circumstances may limit the food type that can be enriched with this fiber.

An important part of the research consisted on the characterization of gels viscoelastic behavior and texture, which were prepared with different psyllium particle dimension (raw and ground) and concentration (2.0%, 2.5% and 3.0%). The Response Surface Methodology was used to study the effect of process conditions (time and temperature) on texture and color characteristics of gels. Texture properties of gels were evaluated by Texture Profile Analysis. Gels dynamic behaviour was studied by a sequence of oscillatory measurements of temperature, time and frequency sweeps. Psyllium gelling properties were improved with the reduction of the fiber particle dimension. Gels revealed potential viscoelastic properties that might be interesting in the industrial purpose of honey jelly production.

Keywords: psyllium, honey jellies, fibre, arabinoxylan, gelling properties.