**Hydrocolloids from Aloe vera: Extraction, characterisation, and rheological studies**

Elpida Atsaloua, Alexandros-Symeon Petropoulosa, Evdoxia Asimakopouloua, Athina Theocharidoua, Sylvie Lousiniana, Dimosthenis Gaganisb, Gkikas Michailosb, Christos Ritzoulisa\*

*a. Department of Food Science and Technology, International Hellenic University, Alexander Campus, 57400 Thessaloniki, Greece.*

*b. M. Aloe Vera Hellas S.A. Processing – Bottling – Trade. Industrial Area Road D & TH, 71601 Heraklion, Crete, Greece.*

*\* Correspondance: critzou@ihu.gr*

This is a detailed investigation of the hydrocolloids derived from Aloe vera in terms of their macromolecular composition, their colloidal properties, and their shear and extensional rheology. Aloe dispersions were prepared as aqueous extracts of the gelled part contained in the leaves of the plant, freeze-dried and then reconstituted. A commercial pure aloe drink, prepared by squeezing the gel contained in the aloe leaves, was also studied.

The dispersionσ were characterized in terms of their macromolecular populations using size exclusion chromatography coupled with multi-angle laser light scattering and UV spectroscopy (SEC–MALLS/UV), and were found to comprise of a high-molecular weight polysaccharidic population and a separate proteinic ensemble. The volume occupancy of the polymers was examined using measurements of their intrinsic viscosities, while their colloidal properties (particle size and charge) were assessed by laser obscuration sizing and zeta potential measurements, as function of the pH.

The flow properties of the liquid systems have been studied using shear and extensional rheology. In agreement with the data collected by the instinsic viscosity measurements, the dried extracts exert vivid shear thickening effects at concentrations above 1%. In terms of extensional viscosity, the dependence of the relaxation time as function of concentration and pH (pH 7.0, pH 3.7 from the ready-made drink, and pH 3.0) is discussed in the light of pH-induced structural rearrangements of the polymers comprising the extracts.