

Colloidal stability properties of Acacia gums and their AGP fractions: Application to the stabilization of polyphenols in red wine

Postdoctoral project:

Acacia gum (GA), also called gum Arabic, is an edible dried gummy exudate obtained from the trunk and branches of *Acacia Senegal* and *Acacia Seyal* trees. GA macromolecules belong to the arabinogalactan-protein (AGP) family. They are soft, hyperbranched, charged and amphoteric heteropolysaccharides mainly composed of carbohydrates (D-galactose, L-arabinose, L-rhamnose, D-glucuronic acid, and 4-O-methyl-D-glucuronic acid) with a small fraction of proteins and minerals. GA can be defined as a continuum of macromolecules differing by their biochemical properties, as the sugar to protein ratio, the hydrophobicity and the charge, and their structural properties, as the hydrodynamic volume and the molar mass.

Acacia gum is used in various industrial applications because of its ability to stabilize aqueous colloidal dispersions (emulsion, foam, solid particle suspension). In oenology, Acacia gum is added to young red wines especially to prevent the precipitation of the coloring matter (i.e. polyphenols). It is advised to use Acacia gum in young red wines at a maximal concentration of 300 mg/L (for its stabilizing properties) even if no legal limit exists. In a previous project, the colloidal stabilizing properties of Acacia gums from several batches and molecular fractions of Acacia gums isolated by chromatographic methods were investigated on hydro-alcoholic - polyphenols matrix and unstable young red wine. Our results showed that the AGP rich in proteins from Acacia gums were highly efficient for the prevention of polyphenols destabilization.

The aim of this second project is to focus on the colloidal stability of polyphenols during the ageing of hydro-alcoholic - polyphenol matrix or unstable young red wine in the presence of Acacia gum, and especially to study the evolution of AGP during the ageing. AGP will be extracted from the hydro-alcoholic - polyphenol matrix during the ageing for their quantification and further structural characterization.

The candidate should have preferentially a Ph.D in physical chemistry of biopolymers (Polysaccharides or polyphenols) or colloids with strong skills in physical characterization of colloidal systems. An experience in biochemistry will be appreciated.

Keywords: Acacia gum, polyphenols, red wine, colloidal stability, SEC MALS

Duration: 12 month. The position will start as soon as possible.

Location: UMR 1208 IATE (“Ingénierie des Agropolymères et Technologies Emergentes”), 2 place Pierre Viala, 34060 Montpellier.

Salary: 2000 euros/month

Applicants should send a letter of interest and a CV to:

Pr. Christian SANCHEZ (sanchez@supagro.fr); Dr. Michaël NIGEN (nigen@supagro.fr); Dr. Thierry DOCO (thierry.doco@inra.fr).