

**VI.WS 2****USE OF FOURIER TRANSFORM INFRARED SPECTROSCOPY (FT-IR) TO RAPIDLY VERIFY THE BOTANICAL AUTHENTICITY OF GUM ARABIC****Mario MALACARNE**

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Gum arabic is composed of a polysaccharide rich in galactose and arabinose along with a small protein fraction [1, 2], which gives its stabilizing power with respect to the coloring substances or tartaric precipitation of bottled wine. It is a gummy exudation from *Acacia* trees; the products used in enology have two possible botanical origins, i.e. *Acacia seyal* and *Acacia senegal*, with different chemical-physical features and consequently different technological effects on wines. The aim of this work is to evaluate the feasibility of discrimination of commercial gums Arabic between their two different sources, on the basis of the absorption of the Fourier Transform Infrared (FT-IR) spectra of their aqueous solutions, in order to propose an extremely rapid and cost-saving method for quality control laboratories.

Forty five samples of commercial gum Arabic were collected on the Italian market of enological products and their botanical origin (*Acacia seyal*, N=30; *Acacia senegal*, N=15) were established by applying the reference method recommended by the International Organisation of Vine and Wine [1], based on the total nitrogen content and the rotatory power. After a dilution to obtain 5% of dry matter aqueous solutions, FT-IR spectra of samples were acquired in the 926–5011  $\text{cm}^{-1}$  range with a resolution of 3.8  $\text{cm}^{-1}$ , and a statistical approach was applied on the FT-IR spectra to verify the ability to distinguish gums Arabic from the two botanical origins. Standard Discriminant Analysis correctly classified all the samples, providing an optimal distinction between the 2 botanical origins on root 1. The robustness of the model was verified using an external validation. For this aim the entire dataset was divided into a 'training' dataset, 80% of samples for the 2 categories, and a 'validation' dataset, the remaining 20%. The model was built using the training dataset and then the validation samples were classified on it and this process was repeated 3 times. In all cases, 100% of correct classification was obtained.

[1] OIV-OENO 27-2000, *Gum Arabic*, COEI-1-GOMARA: 2000.

[2] Lopez-Torrez, L.; Nigen, M.; Williams, P.; Doco, T.; Sanchez, C., *Food Hydrocolloids*, 2015, 51, 41-53.