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CONFERENCE PROCEEDINGS

Botanical and geographical origin characterisation of gum arabic and its detection in wine using a non-targeted high resolution mass spectrometry approach

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Gum arabic (GA) is probably the oldest and best known of all natural gums. It is a complex mixture of macromolecules, mainly carbohydrates and proteins, obtained from several *Acacia* species from the sub-Saharan region of Africa. GA is widely used as edible ingredient in various food and for non-food applications [1]. For oenology, OIV approves the use of both *A. senegal* and *A. seyal* gums, and the European Community indicates a maximum of 200 mg/L as recommended technological dosage [2].

In this study, the botanical origin (*Acacia senegal* vs *A. seyal*) and geographical origin (Kordofan region vs other Sub-Saharan areas) of 44 GA samples were defined with a non-targeted screening approach using high resolution mass spectrometry. The study was performed using a Thermo Ultimate R3000 UHPLC equipped with a byphenyl column (3 x 150 mm, 2.7 μ m). Separation was obtained at a flow rate of 0.3 mL/min with a ternary mobile phase with formic acid 2%, acetonitrile and water. Mass spectra were acquired through a full MS experiment at 70,000 FWHM resolution using a Q-ExactiveTM HRMS equipped with heated electrospray ionization (HESI-II) interface working in positive and negative ion mode.

A bi-factorial PLS-DA analysis indicated 15 masses as possible predictive origin markers, allowing to correctly reclassify 94.4% of the samples to the corresponding cases. Moreover, 40 micro-winery genuine wines (8 varieties) and the same ones randomly added of 200 mg/L of gum Arabic of the 2 origins (*seyal*, n=10; *senegal*, 10) were analysed and processed. The compounds corresponding to m/z 152.1067, 166.1225, 585.1428 and 643.1403, permitted to identify the addition of gum arabic in wine. Principal component analysis performed with the signal (area) of the 4 masses highlighted three groupings differentiating untreated wines, wines treated with *A. senegal* gum and wines treated with *A. seyal* gum. m/z 152.1067 was tentatively identified as N-methyltyramine, while m/z 166.1225 as N,O-dimethyltyramine.

References

1. Coppen J.J.W., Food and Agriculture Organization of the United Nations, Rome, Italy (1995).
2. OIV-Codex, Parigi, Francia (2018).

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