

Highlights of Analytical Sciences in Switzerland

Division of Analytical Sciences

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***Robinia pseudoacacia* (Black Locust) – An Invasive Species with Unsuspected Potential in Grappa Ageing**

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The use of different types of wood for the manufacture of barrels for the maturing of wines has been used since the 5th century BC. Wood has several physical and chemical properties that allow gas exchange between the external environment and the wine while conferring typical aromas to the species used. Spirits such as whiskies, cognacs, armagnacs, grappas and others are matured in wooden barrels giving aroma and color to their coveted nectars.

The wine and spirits industry focuses on a range of well-known species such as oak or chestnut in the production process. However, the environment and climate change make the accessibility and use of these species increasingly complex. In this context, the characteristics of the Black Locust (false acacia – *Robinia pseudoacacia*) (an ubiquitous and invasive species with excellent drought resistance and few specific pathogens) make it potentially resilient. Since the end of the 19th century Robinia

trees were widely planted in the Ticino for the production of poles and beams. A project to develop the use of Robinia for the production of barrel-aged Grappa in partnership with the Swiss Federal Agricultural Research Institute (Agroscope) in Wädenswil and the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) in Birmensdorf has highlighted the aromatic qualities of this species in the production of quality distillates.

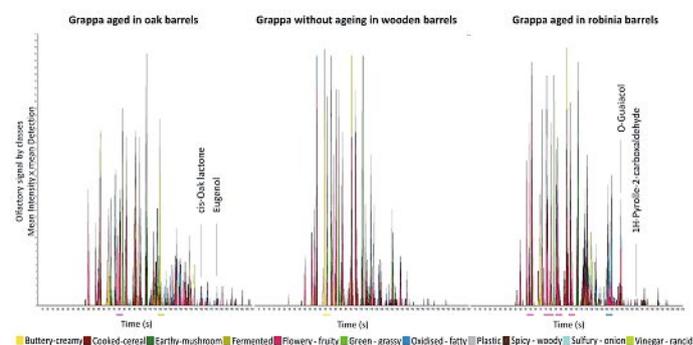
The project consisted of the manufacture of several 50-litre Robinia barrels for the controlled ageing of Grappa produced from typical Ticino Merlot marc. Regular samples of the distillates during a 6-month ageing period were evaluated by a sensory panel as well as by gas chromatography – mass spectrometry – olfactometry to identify aromatic characteristics throughout the maturation period. Very promising results showed that the maturation in Robinia barrels had more intense floral, fruity, and herbal aromatic characteristics than in oak barrels. However, the maturation period is slower than in oak. It takes about 50 days for the Robinia when the oak requires only 28 days (according to sensory evaluation). This can be explained by the denser wood fiber than in oak which limits exchanges with the outside environment.

The analyses showed a slightly different diversity of volatile compounds than with oak. Some aromatic compounds come exclusively from oak (*e.g.* *cis*-Oak lactone or Eugenol) and give spicy and fruity notes to the distillates that Robinia cannot generate. However, other compounds are present in both wood species but are extracted more rapidly in Robinia than in oak (O-guaiacol and 1H-pyrrole-2-carboxaldehyde). These compounds are therefore found in greater quantities in the distillates and bring unique aromatic variations to them.

In the future, Robinia barrels could offer a more diverse range of aromas to the grappa producers.



Merlot grape, distillation, and ageing of the grappa distillates in Robinia barrels.



Olfactometric profile (N=8) of grappa distillates aged in oak barrels versus in Robinia barrels after 180 days.

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