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Unclouding the mechanisms behind haze episodes in cider-chain beverages

Ciders and cider-chain beverages can sometimes experience non-yeast clouding when in storage, despite being clarified before bottling. Even though it generally has no effect whatsoever on product taste and drinkability, the sheer presence of a physico-chemical haze, and especially precipitates, often turns consumers and retailers away.

▸ RESULTS

In beer, haze is caused by protein–polyphenol interactions, whereas in pommeau (an aperitif made from mixing apple juice and apple brandy), haze is visibly the work of polyphenols. The oxidation of procyanidins (tannins) produces new compounds that can self-aggregate and form a heat-reversible 'chill haze'. However, when apple juices—and especially polyphenol-poor juices—go cloudy, it is proteins that drive the process. The proteins involved are plant defence proteins that get denatured at high temperatures (>80°C), leading them to self-aggregate and form a protein haze. The haze may well also contain polyphenols, as these protein aggregates can interact with procyanidin oligomers, in a mechanism that mirrors haze formation in certain white wines.

▸ FUTURE OUTLOOK

Now that we have evidenced two difference haze mechanisms, appropriate preventive measures can be tailored to eliminate haze episodes and enable ciders—and particularly pommeau—to keep their clarity for longer without added stabilizers. The IFPC [French Institute for Cidermaking] mobilized this research to run technical process trials, and showed that the clarity of pommeau is extendable by cold microfiltration to screen out the compounds that create haze.

Participants

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INRA's partner in Actia Nova²Cidre, the IFPC [French Institute for Cidermaking], also co-funded M. Millet's thesis

Read more

PhD thesis led at Agrocampus–West France under a UEB—European University of Brittany doctorate programme, defended in Rennes on 18 May 2018

M. Millet. *Composition et mécanismes de formation des troubles dans les produits cidricoles* - 293 pages

Self-aggregation of oxidized procyanidins contribute to the formation of heat-reversible haze in apple-based liqueur wine

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