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Synergistic effects of branched-chain amino acids and linoleic acid addition on volatile compounds in wine during alcoholic fermentation

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Branched-chain amino acids (BCAAs, including L-leucine, L-isoleucine and L-valine) are important volatile compounds precursors in grape must, which can directly influence the aroma profile of final wine. Linoleic acid, as the most abundant fatty acid in must, has great effect on yeast fermentation performance and formation of volatile compounds in wine. To investigate the synergistic influences of BCAAs and linoleic acid on volatile compounds of wine, BCAAs (120 mg/l L-leucine, 100 mg/l L-isoleucine and 90 mg/l L-valine) were added into Cabernet Sauvignon grape juice containing three concentration of linoleic acid (12 mg/L, 120 mg/L and 240 mg/L) fermented by *Saccharomyces cerevisiae* EC1118, respectively. The supplementation of BCAAs in must with low linoleic acid (12 mg/l) promoted the production of most volatile compounds, including higher alcohols (isobutanol, 2, 3-butanediol and 2-phenylethanol), acetate esters (isoamyl acetate and 2-phenylethyl acetate) and ethyl esters (ethyl butanoate and ethyl octanoate). As assessed by odour activity values, the increment of these volatile compounds intensified the fruity, flowery, herbaceous and caramel attributes of the final wine. On the other hand, adding BCAAs in must with medium (120 mg/l) or high (240 mg/l) linoleic acid increased the concentrations of medium-chain fatty acids (hexanoic acid, octanoic acid and decanoic acid), and enhanced the fatty profiles of wine compared to the wine of low linoleic acid addition. These results suggested that the beneficial effect of adding BCAAs on volatile compounds in wine is largely dependent on the level of linoleic acid in grape must, and the combined addition of BCAAs and linoleic acid could be a potential way to manipulate wine's aromatic profile by influencing the formation of certain aroma compounds.

Biography

Peitong Liu is a PhD candidate at Key Laboratory of Viticulture and Enology, China Agricultural University. Her research interests focus on wine fermentative flavour compounds.

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