

Evaluation of aroma characteristics in *Vitis amurensis* grapes across different regions by using HS-SPME-GC/MS

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Background: Aroma compounds are important secondary metabolite in grapes and play important roles in the flavor and quality of grape berries and their wines. *Vitis amurensis* grape belongs to the East Asian *Vitis* spp., with excellent cold and disease resistance, and exhibits strong brewing potential. However, it has not been effectively utilized and there is no systematic research on the aroma compounds of *V. amurensis* grapes.

Methods: To provide sufficient experimental evidence for the characteristic aroma of *V. amurensis* grape, HS-SPME-GC/MS was used to identify the aroma compounds of five *V. amurensis* ('Beiguohong', 'Beiguolan', 'Shuangfeng', 'Shuanghong', 'Shuangyou') and three interspecific hybrids ('Beibinghong', 'Xuelanhong', 'Zuoyouhong') grapes in Zuoja and Ji'an. The grape berries were collected at harvest in 2020, 2021 and 2022.

Results: C6/C9 compounds were the most abundant volatile compounds in all grape varieties. Good differentiation among varieties and regions was achieved by free and bound volatile compounds in OPLS-DA and O2PLS-DA. *V. amurensis* grapes had more abundant aroma compounds than the interspecific hybrid berries. Compared to Ji'an, the grapes in Zuoja contained higher levels of substances, including C6/C9 compounds, terpenes, norisoprenoids and alcohols. Terpenes were found abundant in 'Beibinghong', C6/C9 compounds, aldehydes/ketones and alcohols such as (*E*)-2-hexenal, hexenal, 3-ethyl-4-methylpentanol were characteristic compounds of 'Shuangfeng'.

Conclusion: Different varieties and regions of *V. amurensis* grapes exhibited different characteristics in aroma compounds. The study explored the volatile profiles of *V. amurensis* grapes, which can provide a reference for the development and utilization of *V. amurensis* grapes.

Keywords: *Vitis amurensis*, Wild grape, Aroma compounds