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## Sparkling wines and atypical aging: investigating the risk of refermentation

### Abstract

Sparkling wine (SW) production entails a two-steps process where grape must undergoes a primary fermentation to produce a base wine (BW) which is then refermented to become a SW. This process allows for the development of a new physicochemical profile characterized by the presence of foam and a different organoleptic profile.

Atypical aging is a sensorial fault that can occur soon after bottling. Characterized by the appearance of unpleasant scents (mothballs, damp towel and furniture polish) and the loss of varietal aroma, its chemical and sensorial origin is attributed to the presence of 2-aminoacetophenone (AAP), a degradation compound of indole-3-lactic acid (IAA). While at biological level this plant auxin is carefully regulated via bonding with amino acids or sugars, during fermentation, yeast is capable of freeing up unbound IAA. In the presence of oxidizing agents, its conversion into AAP leads to the appearance of ATA in wine.<sup>(1)</sup> Since yeast-related biochemical mechanisms are involved in the development of this fault and SW production entails a double fermentation process, the final product deserves extra attention in terms of ATA development. Therefore, the aim of this study was to evaluate the likelihood of producing tainted SW. To do so, 55 grape musts of 12 different varieties harvested over three vintages were fermented twice, initially to make the BWs and then the SWs. Interestingly, it was found that not only refermentation and storage increased the AAP content but also that the danger of producing ATA-tainted wines does not end with the making of SW. Indeed, upon an accelerated aging test, it was observed that the concentration of AAP was even increased. By using the data obtained from the BW samples, an ANCOVA model of linearization able to predict the formation of AAP upon refermentation with a  $R^2$  of 0.7 was created.

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### Authors

Simone Delaiti<sup>1,2\*</sup>, Tomas Roman<sup>2</sup>, Tiziana Nardin<sup>2</sup>, Stefano Pedo<sup>2</sup>, Roberto Larcher<sup>2</sup>

<sup>1</sup>C3A, Center Agriculture Food Environment, Via Edmund Mach, 1, San Michele all'Adige, TN, 38010 Italy

<sup>2</sup>Technology Transfer Centre, Fondazione Edmund Mach, San Michele all'Adige, Italy

### Contact the author\*

simone.delaiti@fmach.it

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