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TARGETED METABOLOMICS EMPLOYED FOR THE STUDYING OF 'PINOT NOIR' GRAPE SKIN PHENOLICS AS INDUCED BY CANOPY MICROCLIMATE MANIPULATION

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Apart from variety specifics, the occurrence of grapevine secondary metabolites is largely determined by geo-climatic conditions in which the plant is grown. Even if regional macroclimate conditions basically cannot be influenced, the canopy microclimate of cluster area on the other hand can be manoeuvred by implementing some viticultural practices (e.g. leaf removal) into the vineyard environment, especially if performed at different phenological stages of grape berry development. Earlier research efforts to reveal the effect of canopy microclimate manipulation on grape quality parameters were mainly focused only to few targeted compounds. Contrary, newer analytical approaches (such as metabolomics), are offering much wider possibilities to study plant secondary metabolism within such purposely-induced microclimate shifts. A field trial was thus designed in 'Pinot Noir' vineyard in order to reveal related alternations of multiple classes of skin phenolics, including some very rarely studied ones to date. Different accumulation trends during grape berry development were detected not only between groups but interestingly also between individual compounds within those groups. Canopy microclimate manipulation had a significant effect in case of anthocyanins and flavonols, particularly early peaking flavonols. Despite the fact that flavonols and anthocyanins share the same biosynthetic pathway, it seems possible to positively affect both classes since the peaking behaviour of many individuals during berry development is distinct. Stilbenes were generally highest in case of closed canopy, most probably due to better conditions for *B. cinerea* development. Within benzoates, syringic acid was the only representative still showing significant changes in favour of early leaf removal at harvest. Other classes of polyphenols, such as flavones, flavan-3-ols, flavanones and hydroxycinnamic acids essentially reduced their concentration from the time of veraison, with differences between treatments often obtained only in earlier stages of maturation. However, in total 31 out of 72 detected phenolic compounds still showed significant differences at harvest point in comparison to the control for at least one of the three leaf removal approaches.