P56 – Hydraulic safety and xylem morphological traits in a panel of *Vitis vinifera* varieties

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Abstract

Water deficit can significantly impact grapevine physiology, growth, yield, and berry quality. Recent studies provided evidence of interactive and complex relationships between leaf hydraulic and stomatal control of transpiration under drought, suggesting the need to integrate multiple traits in defining the so-called grapevine drought tolerance. However, to date, genotypic variation for xylem morpholigcal traits and hydrauylic safety truough the assessment of percent loss of conductivity (PLC) has never been explored in a large panel of grapevine varieties. In addition, significant discrepancy exists in the literature for vulnerability to water stress-induced cavitation in grapevine, potentially due to the different methods used (e.g., centrifuge, dehydration, air-injection methods). In our work, twelve own-rooted grapevine varieties adapted to different European wine regions and known to hold dissimilar hydraulic behavior were grown under greenhouse conditions and assessed for xylem morphological traits and PLC. Significant genotypic variation was observed for xylem vessel diameter (XVD), number and total area, with cultivars known to behave as anysohydric (Sémillon, Syrah, Sangiovese) showing larger XVD than so-called isohydric varieties (Cabernet Sauvignon, Grenache, Macabeo). Regarding xylem vulnerability, there also were distinctions between cultivars of iso- and anisohydric tendencies. To our knowledge, this is the first study providing evidence of a broad genotypic variation in grapevine for hydraulic traits.

Keywords: drought, embolism, grapevine, *Vitis vinifera*