

Physiology interaction between rootstock-scion affect vascular system and frequency of vessels in *Vitis vinifera* L. Cabernet Sauvignon and Merlot

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The interaction between rootstock and scion can interfere with the vegetative and productive balance of grapevines and affect the morphology, anatomy, and physiology of plants. The aim of this work was evaluated the interaction of rootstock-scion on the vegetative growth in *Vitis vinifera*, with emphasis on vascular system and physiological variables. Photomicrograph analysis of the stem in Cabernet Sauvignon and Merlot varieties under different rootstock genotypes Paulsen 1103 (*Vitis berlandieri* × *Vitis rupestris*), Mgt. 101-14 (*Vitis riparia* × *V. rupestris*), and SO4 (*V. berlandieri* × *V. riparia*) were used. The experiment was arranged as a 3 x 2 factorial design, completely randomized, with 4 replications and 12 vines per plot. Data were subjected to factorial ANOVA and the means were subjected to Tukey test at 5% of probability. Vegetative growth variables, and the analysis of vascular system by quantifying the xylem and vessels frequency associated with hydraulic conductivity were evaluated. Differences in vegetative growth, influenced by the interaction of rootstock/scion are associated with differences in the vascular system. Rootstocks that are more vigorous (P1103 and SO4) provided vessels with larger diameter, larger xylem area, and higher hydraulic conductivity potential of the branches in Cabernet Sauvignon and Merlot. The Mgt 101-14 provided smaller xylem and vessels with smaller diameter on branches of Cabernet Sauvignon and Merlot. An increase in vessels diameter and xylem area and a decrease in vessel density were noted according to the branch morphology (apex to base). The rootstocks interfered on the meristematic and on the cambial activity of the scion variety by modifying the vascular system and vascularization pattern in grapevines. This modification occurred in relation to the vigor of the grafted materials and the specific rootstock-scion combination. The interaction of rootstock-scion interfered on the physiology of grapevines by altering the vascular system, and these results can implicate on the vineyard management.

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