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## Supplementary Material

### **Comparison of isohydric and anisohydric *Vitis vinifera* L. cultivars reveals a fine balance between hydraulic resistances, driving forces and transpiration in ripening berries**

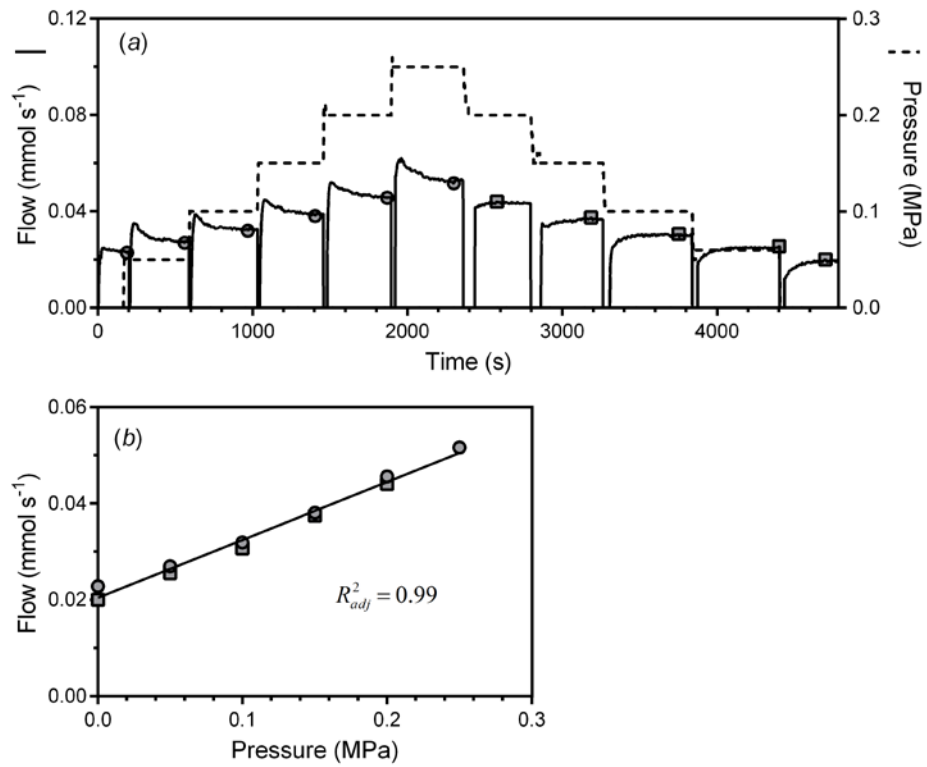
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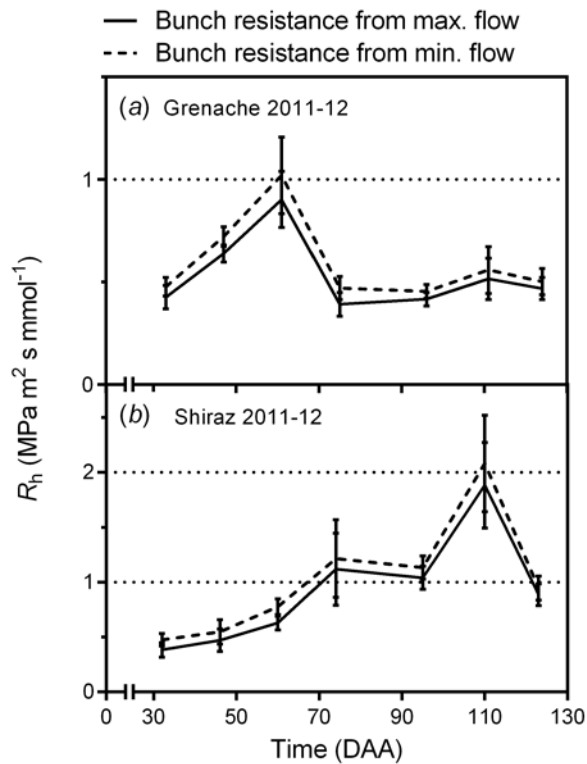
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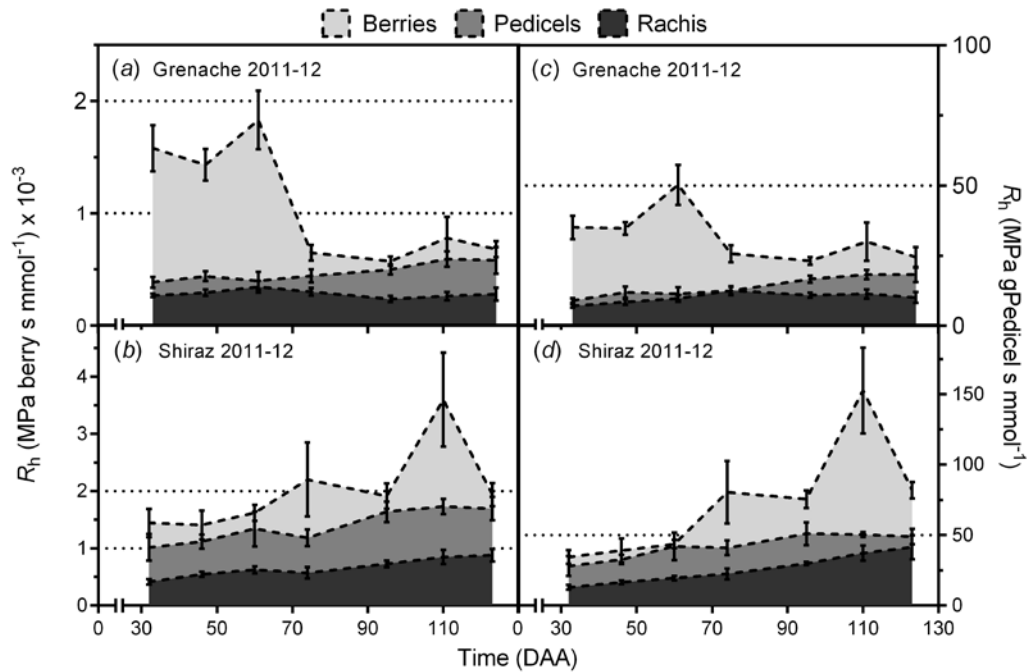
**Fig. S1.** Close-up views of the custom-made transpiration chamber: (a) Socket for the Eppendorf tubes; (b) Eppendorf tube with rubber seal; (c) Assembled berry holder unit; (d) Lid of the transpiration chamber with individual berry cells; (e) Complete transpiration chamber (upside down); (f) Transpiration chamber with one berry holder unit attached.



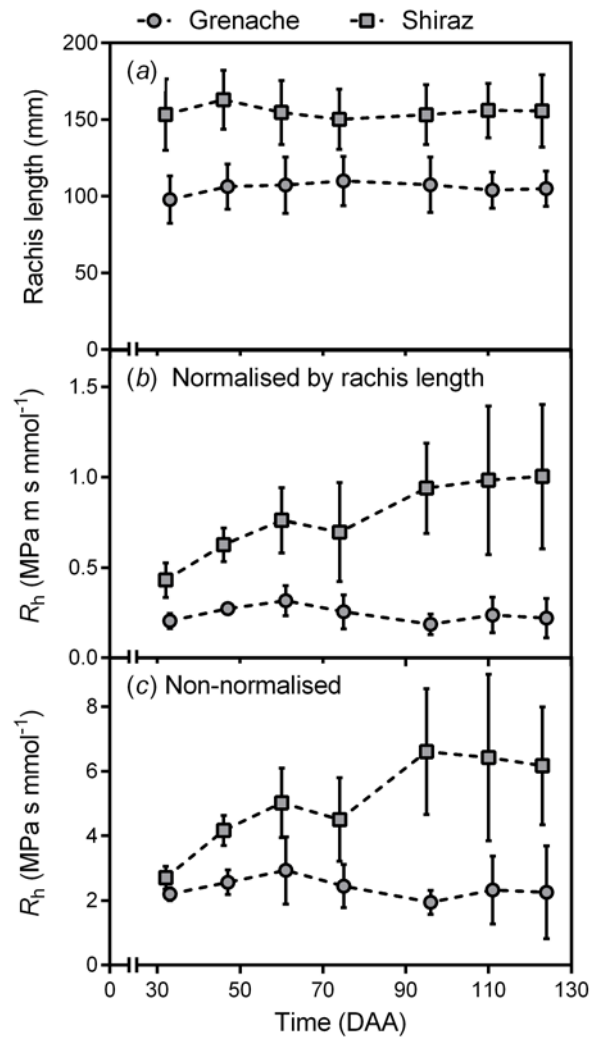
**Fig. S2.** Online measurement of flow rate (solid line) of purified, degassed water into an intact grape cluster in relation to predefined pressure changes of the fluid (dashed line) applied by the XYL'EM apparatus over a time period of 80 min (a). Steady-state flow rates were selected to calculate hydraulic conductance; for increasing pressure steps these were equivalent to the lowest recorded flow (solid circles) and for decreasing pressure steps equivalent to the highest recorded flow (solid squares). The hydraulic conductance is defined as slope of a linear regression (solid line) between xylem flow rate and pressure (b). Flow rates from increasing and decreasing pressure steps are very similar.



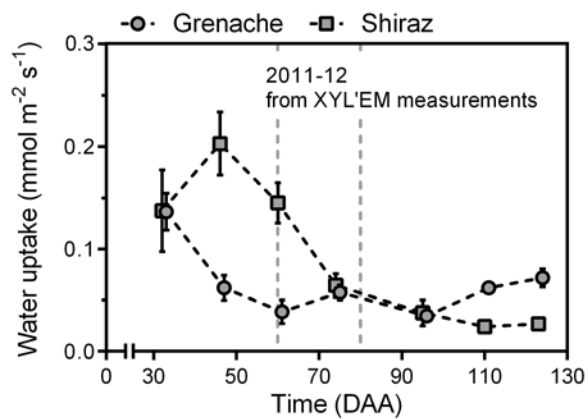
**Fig. S3.** Comparison of hydraulic resistances ( $R_h$ ) of intact grape clusters from the *Vitis vinifera* L. cultivars Grenache (a) and Shiraz (b) (season 2011-12) which were calculated from pressure vs flow measurements using the XYL'EM flowmeter from which either maximum flow rates of each pressure step (solid line) or minimum flow rates at the end of each pressure step (dashed line) were taken for the calculations. Hydraulic resistances were normalised to berry surface area and data are shown as means (centre of the error bar)  $\pm$  s.e.m. ( $n = 4-5$  measurements at each time point).



**Fig. S4.** Hydraulic resistances ( $R_h$ ) of structural elements of grape clusters from the *Vitis vinifera* L. cultivars Grenache and Shiraz (season 2011–12) normalised by two alternative methods; normalisation against number of berries per cluster (*a, b*; which equals numbers of pedicels) and pedicel weight per cluster (*c, d*).  $R_h$  of intact grape clusters (upper dashed line), rachis with pedicels attached (middle dashed line), and the rachis proper (lower dashed line) were measured and are shown as means (centre of the error bar)  $\pm$  s.e.m. ( $n = 4-5$  measurements at each time point). The areas between the lines reflect  $R_h$  of berries (light grey area), pedicels (intermediate grey area), and rachis (dark grey area) of ripening grape clusters (combined area).



**Fig. S5.** Rachis length (a) and calculated hydraulic resistances ( $R_h$ ) of the rachis of grape clusters from the *Vitis vinifera* L. cultivars Grenache (solid circles) and Shiraz (solid squares) (season 2011–12) normalised by rachis length (b) and non-normalised (c). Data are shown as means (centre of the error bar)  $\pm$  s.e.m. ( $n = 4-5$  measurements at each time point).



**Fig. S6.** Water uptake rates into grape clusters of the *Vitis vinifera* L. cultivars Grenache (solid circles) and Shiraz (solid squares) measured with the XYL'EM flowmeter at zero applied pressure during the season 2011–12. Uptake rates were normalized by estimated total cluster surface area. The time period between the dashed lines corresponds to the transitional phase of berry softening and colour change from veraison on. Means  $\pm$  s.e.m.  $n = 4 - 5$  grape clusters at each time point.