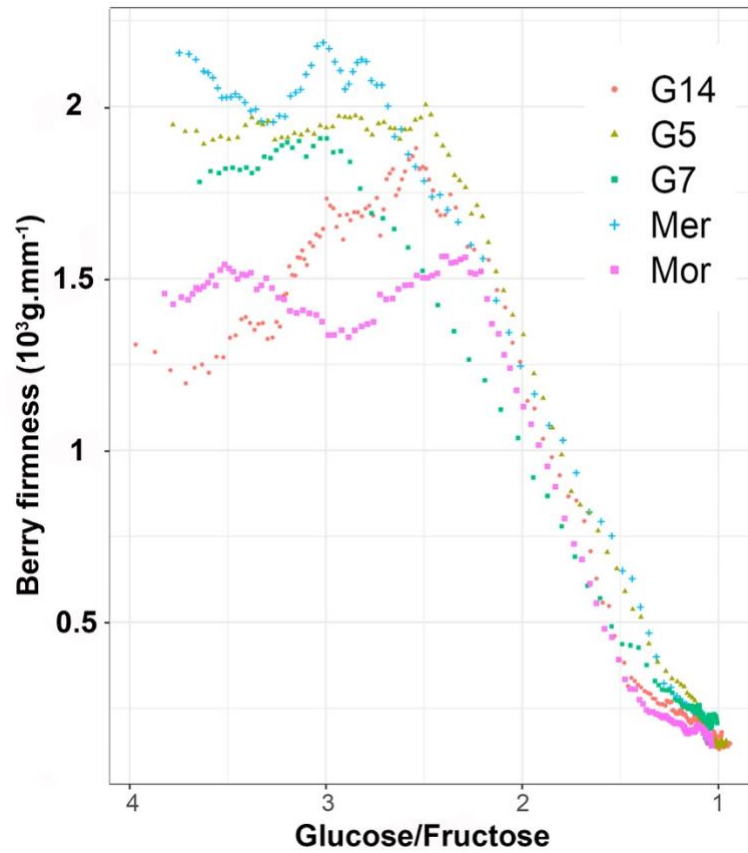
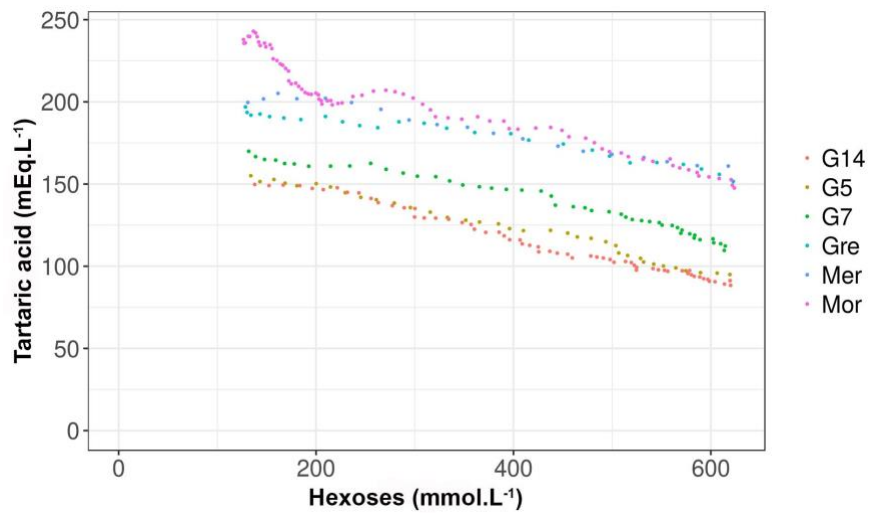


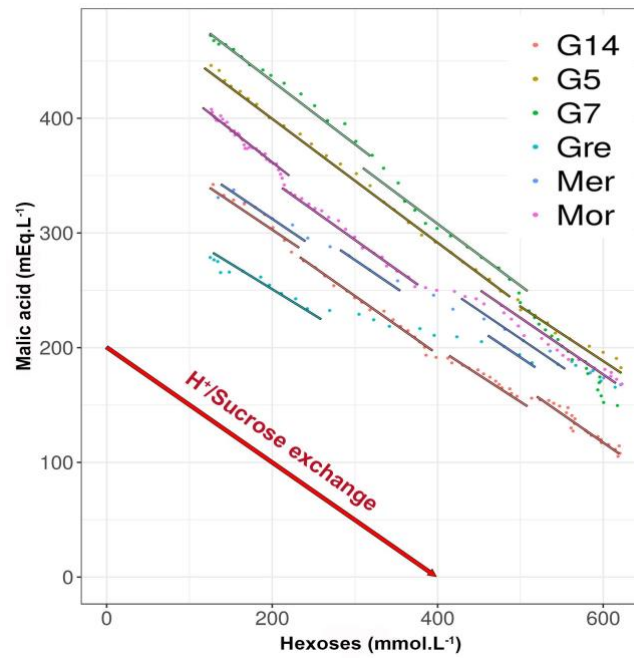
## Supplemental Material



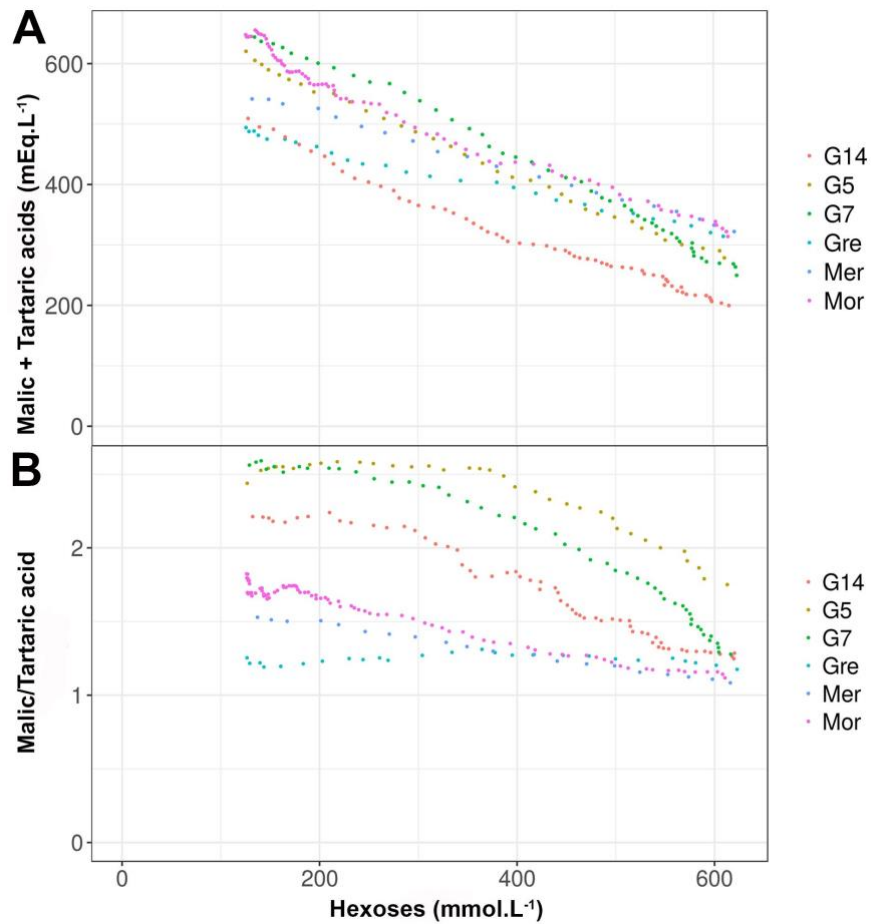
**FIGURE S1.** Evolution of berry firmness depending on the glucose/fructose ratio during fruit ripening. Each dot represents the average of sets of 10 berries ranked according to their G/F ratio (error bars are not displayed to improve readability).



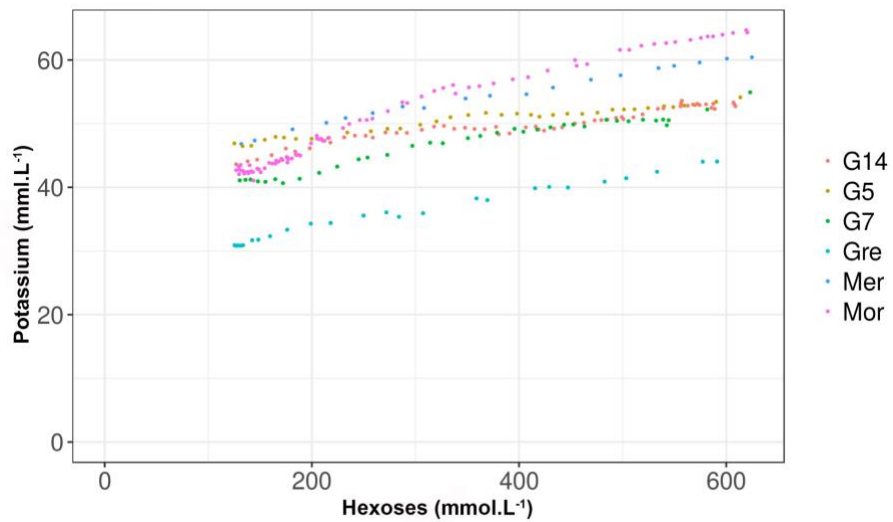
**FIGURE S2.** Evolution of tartaric acid concentration at the early stages ([Hex] from 125 to 625 mmol/L) of fruit ripening of 6 grapevine varieties. Each dot represents the average of sets of 10 berries ranked according to their hexose concentration (error bars being not displayed to improve readability).



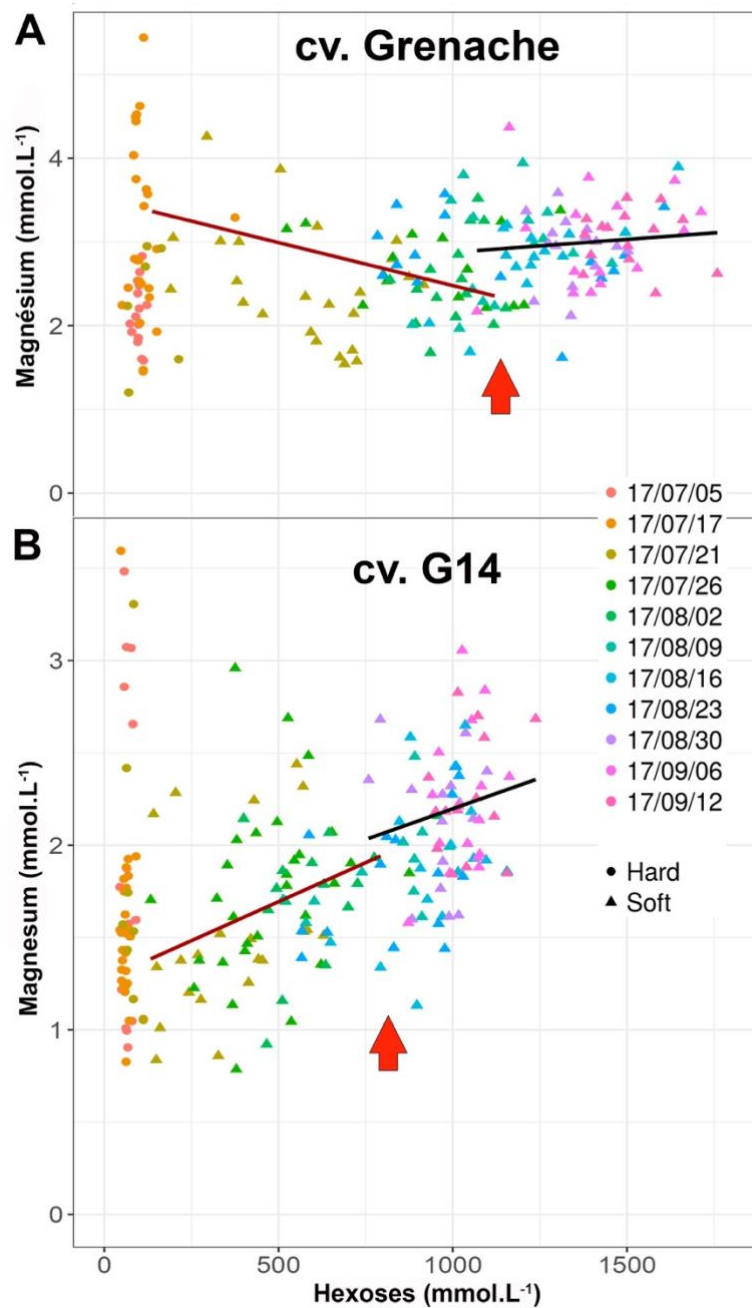
**FIGURE S3.** Repeatability of the malic acid/sugar exchange during early berry ripening (125-625 mmol/L [Hex]) of 6 grapevine varieties. Each dot represents the average of sets of 10 berries ranked according to their hexose concentration (error bars are not displayed to improve readability).



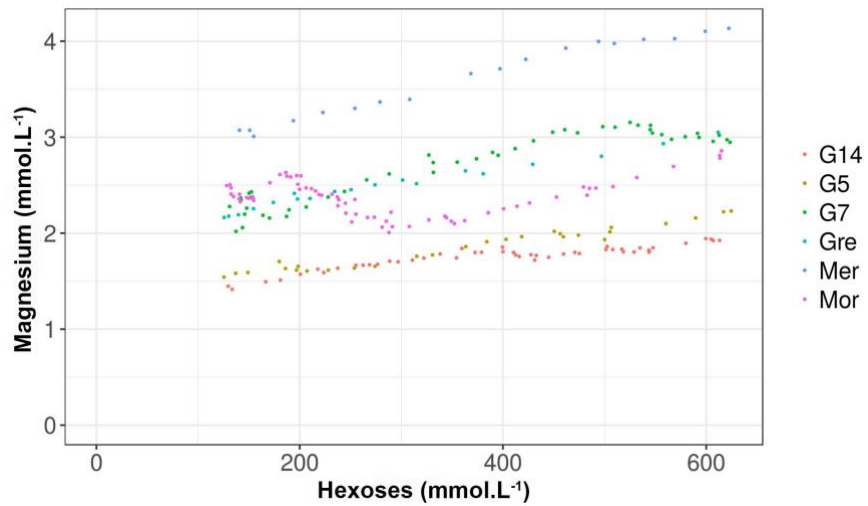
**FIGURE S4.** Evolution of the sum of malic and tartaric acid concentration (A) and malate/tartrate (B) during the early berry ripening (125-625 mmol/L [Hex]) of 6 grapevine varieties. Each dot represents the average of sets of 10 berries ranked according to their hexose concentration (error bars are not displayed to improve readability).



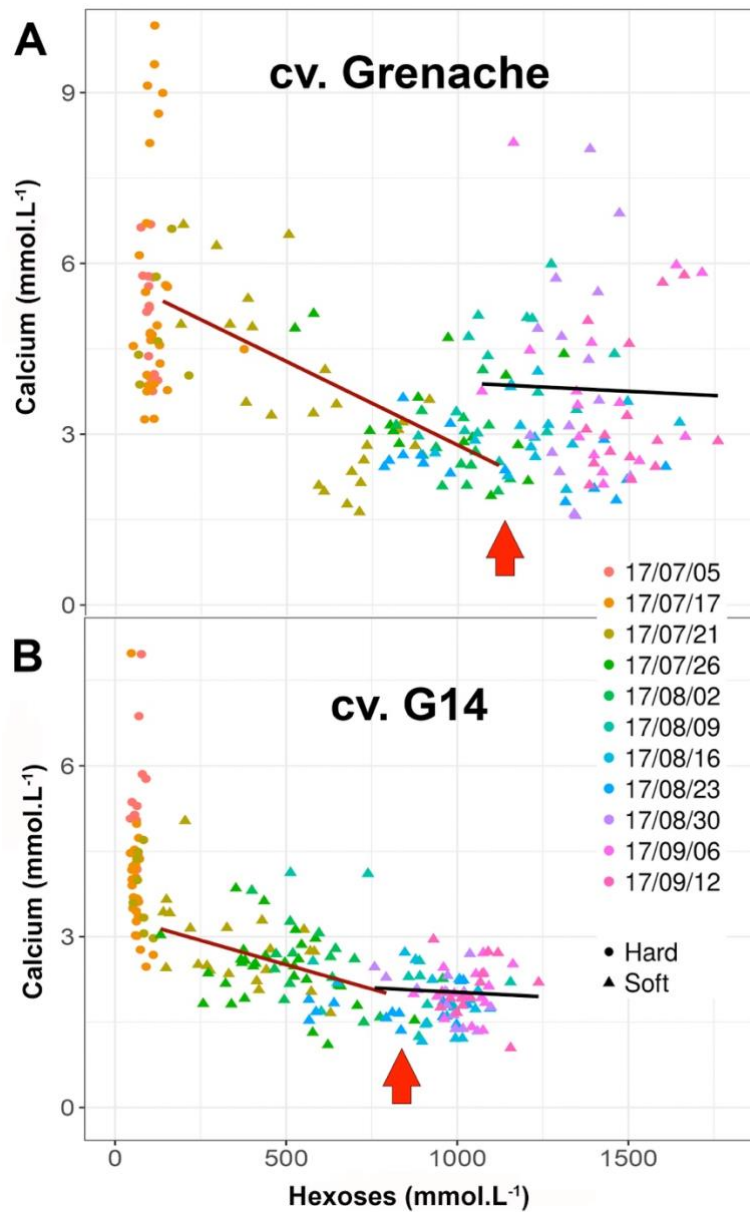
**FIGURE S5.** Evolution of potassium concentration during the early ripening (125-625 mmol/L [Hex]) of 6 grapevine varieties. Each dot represents the average of sets of 10 berries ranked according to their hexose concentration (error bars are not displayed to improve readability).



**FIGURE S6.** Evolution of magnesium concentration during the berry ripening of Grenache (A) and G14 (B). Lines correspond to linear fitting during and after phloem unloading. Each dot corresponds to a single (solid circle) hard or soft (triangle) berry. Solid lines correspond to successive linear regressions for soft berries before and after phloem loading arrest (3 latest dates). Red arrows indicate the stage of phloem loading arrest.

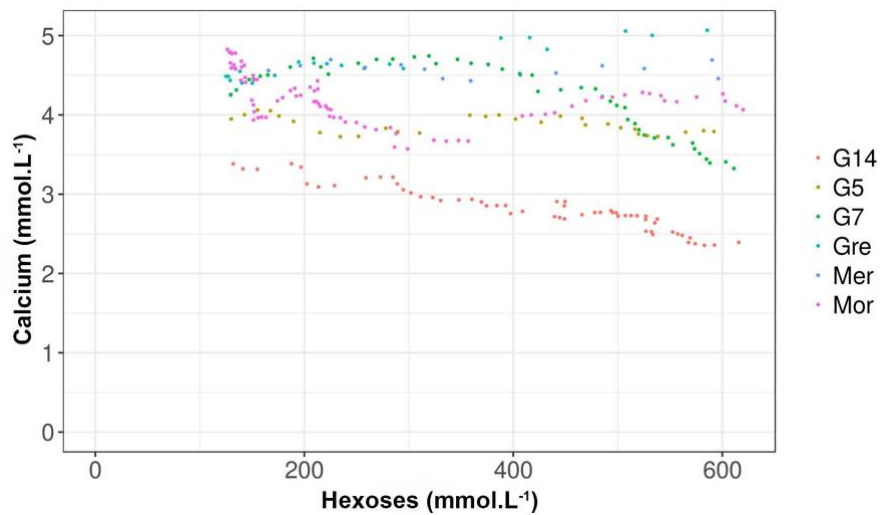


**FIGURE S7.** Evolution of magnesium concentration during the early ripening (125-625 mmol/L [Hex]) of 6 grapevine varieties. Each dot represents the average of sets of 10 berries ranked according to their hexose concentration (error bars are not displayed to improve readability).



**FIGURE S8.** Evolution of calcium concentration during the berry ripening of Grenache (A) and G14 (B). Lines correspond to linear fitting during and after phloem unloading. Each dot corresponds to a single (solid circle) hard or soft (triangle) berry. Solid lines correspond to successive linear regressions for soft berries before and after phloem loading arrest (3 last dates). Red arrows indicate the stage of phloem loading arrest.





**FIGURE S9.** Evolution of calcium concentration during the early ripening (125-625 mmol/L [Hex]) of 6 grapevine varieties. Each dot represents the average of sets of 10 berries ranked according to their hexose concentration (error bars are not displayed to improve readability).