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In recent years there has been interest in breeding new wine grape cultivars to allow a good ecological adaptation and for obtaining wines of greater quality. Crossbreeding appears as the best method to achieve this^(a). The analysis of progenies enables the selection for the best hybrids. We have not found any report on the cell wall material (CWM) composition of the berry skin from intraspecific hybrids crosses. Differences in morphology and composition of grape skin CWM could explain the differences observed between cultivars in the ease of skin degradation during the winemaking. Monastrell is the main wine grape cultivar in southeastern Spain. Their high amount of CWM and characteristic composition could explain the difficulties experienced in skin degradation^(b). Cabernet Sauvignon is usually used to complement Monastrell wines.

The objective of this study was characterize the skin cell wall of grapes from plants resulting from intraspecific crosses of *Vitis vinifera* varieties Monastrell × Cabernet Sauvignon.

EXPERIMENTATION

All the samples were cultivated in the same vineyard. CWM was isolated following the procedure of de Vries et al. (1981)^(c). The total phenolic compounds content was determined by the colorimetric Folin reagent assay. The neutral sugar composition of the CWM was determined by GLC after pre-treatment, hydrolysis and conversion of the products into alditol acetates. Uronic acids content were determined by the colorimetric 3,5-dimethylphenol assay. Amino acids composition was determined after acid hydrolysis, using norleucine as internal standard. Infrared spectral acquisition was performed by spectrometry.

RESULTS

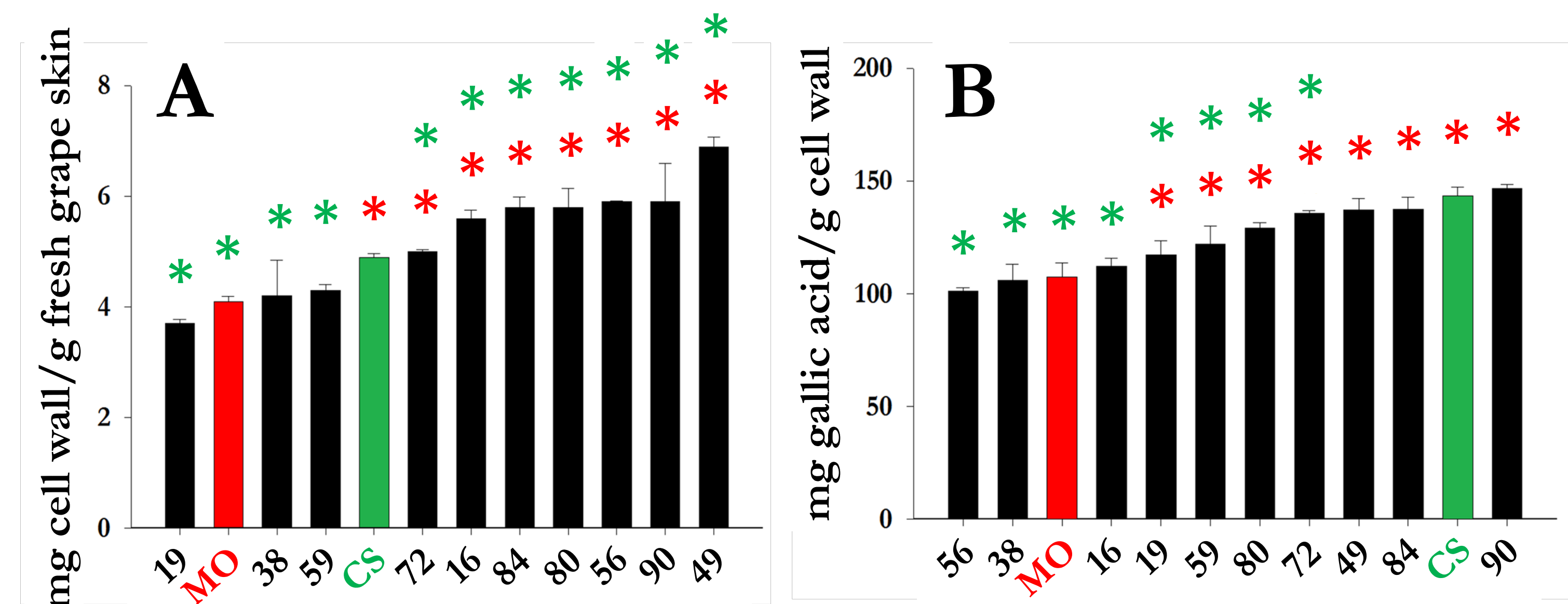


Figure 1. Isolation efficiency (A) and total phenolic compounds content (B) of the cell wall material from the skin of Monastrell, Cabernet Sauvignon and different Monastrell x Cabernet Sauvignon hybrids grapes (each bar represents the mean value of three samples).

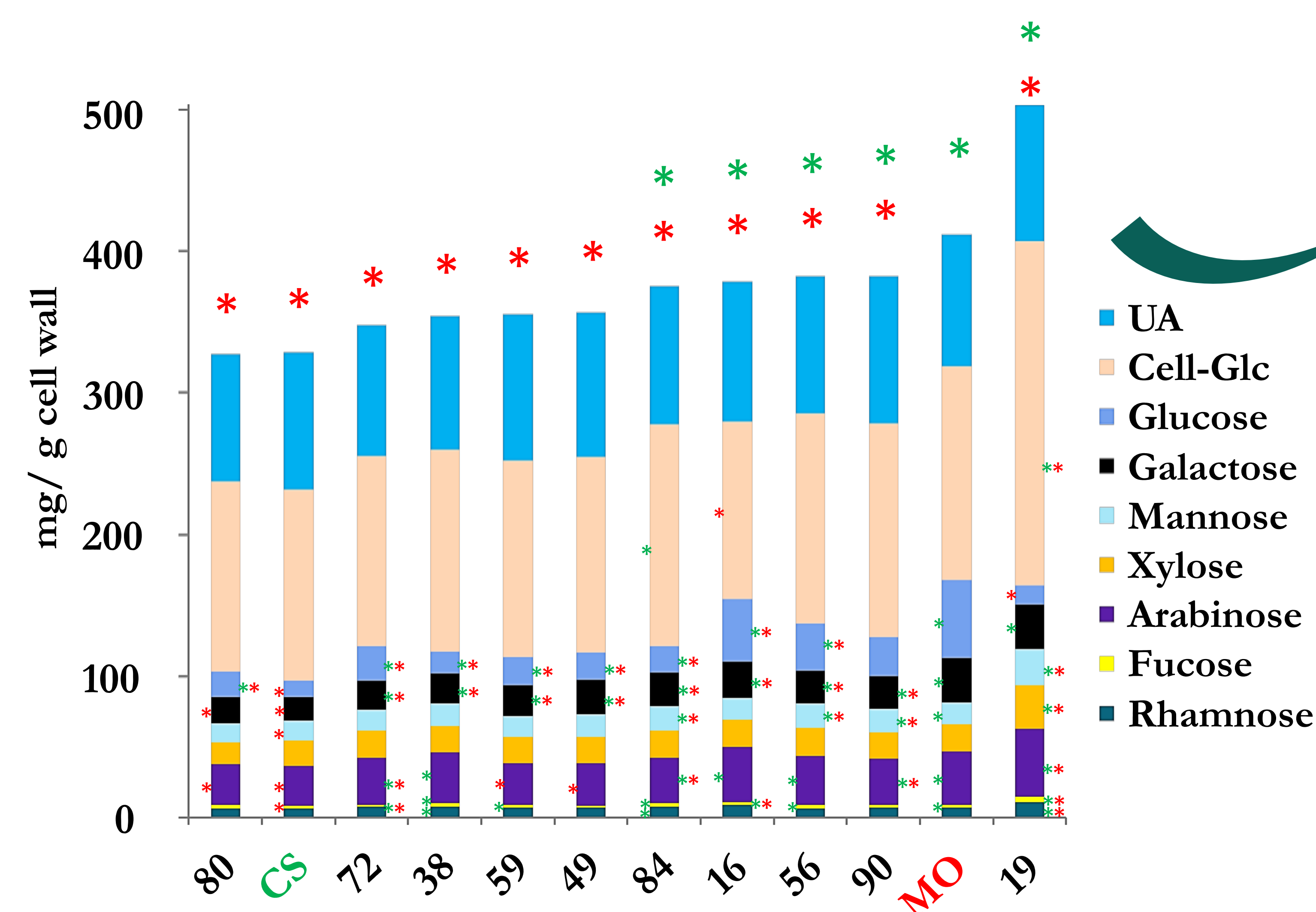


Figure 2. Carbohydrate composition of the cell wall material from the skin of Monastrell, Cabernet Sauvignon and different Monastrell x Cabernet Sauvignon hybrids grapes (each bar represents the mean value of three samples).

Samples selection for Infrared Spectral acquisition and Aas analysis: 16, 19, 38, 72, 84

*Green asterisk represents significant differences with Cabernet Sauvignon samples according to an LSD test ($p < 0.05$).

*Red asterisk represents significant differences with Monastrell samples according to an LSD test ($p < 0.05$).

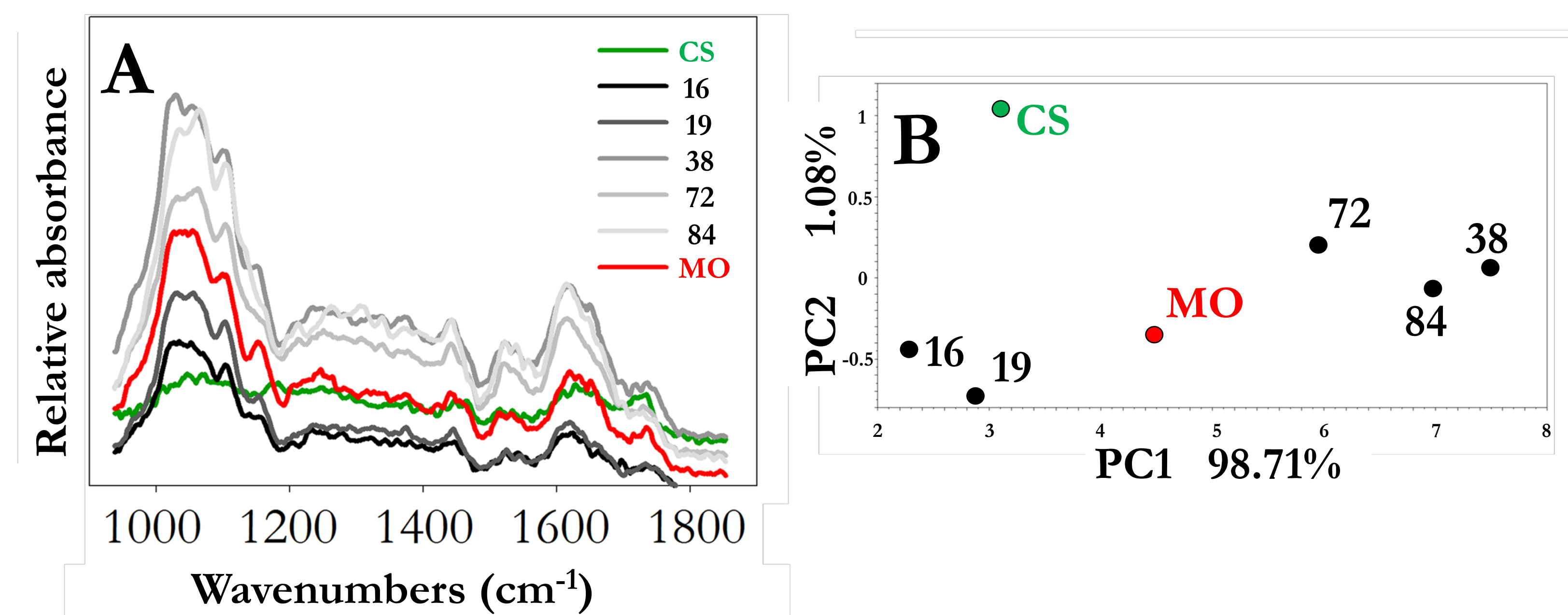


Figure 3. Infrared spectra (A) and PCA (B) of the cell wall material from the skin of Monastrell, Cabernet Sauvignon and different Monastrell x Cabernet Sauvignon hybrids grapes.

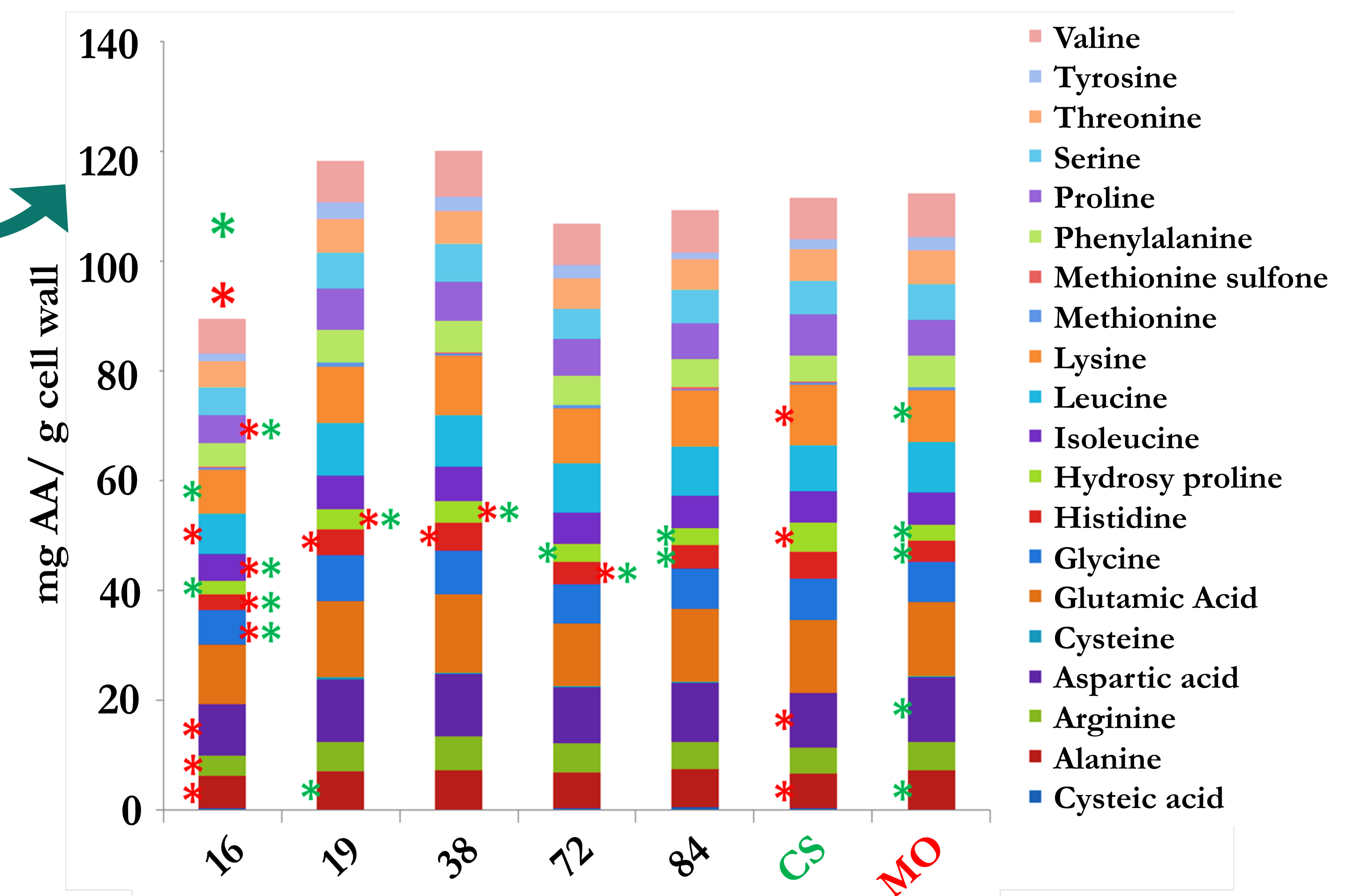


Figure 4. Amino acid content (mg / g cell wall) of the CWM from the skin of Monastrell, Cabernet Sauvignon and different Monastrell x Cabernet Sauvignon hybrids grapes (each bar represents the mean value of three samples).

CONCLUSIONS

Skin cell walls from Monastrell x Cabernet Sauvignon hybrids grapes showed major differences of composition and morphology compared with their parental.

Our study provides relevant information for future breeding programs in order to develop new varieties with an optimal cell wall composition which will improve quality and competitiveness of wines.

REFERENCES

- ^aFangmei, L. and Fengqin, Z. Grape breeding in China. In: *Proceedings of the Fifth International Symposium on Grape Breeding*, (1989), pp 212-215.
^bOrtega-Regules, A.E.; Romero-Cascales, I.; Ros-García, J.M.; López-Roca, J.M.; Gómez-Plaza, E. *Analytica Chimica Acta*, 563 (2006), pp 26-32.
^cde Vries, J.A.; Rombouts, F.M.; Voragen, A.G.J.; Pilnik, W. *Carbohydrate Polymers*, 1 (1981) pp 117-127.