



Geomorphology and wine: the case of Malvasia Istriana in the Vipava valley (Slovenia)

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The concept of terroir incorporates interaction between geogenic and anthropogenic parameters and defines the typicity and quality of wine in a particular geographic area. Geomorphology represents one of the most important geogenic parameters of terroir and in some cases defines the quality of grapes and wines. The geomorphological position of not only the vineyard but also the grapes within individual vineyards has a marked influence on vine quality. In 2008 we produced two wines (Upper Malvasia Istriana (UM) and Lower Malvasia Istriana (LM)) from two different sites located within the same Lončarjevec vineyard. The UM was planted on the terraced slope while the LM was planted in the relatively flat bottom of the valley. Despite identical vine growing techniques and winemaking techniques the two sites yielded grapes of different quality (differences in total acidity and pH values of grape juice) and also vines of different quality (the upper site was of better quality). Because the Lončarjevec vineyard has uniform bedrock geology and the same macroclimatic conditions the significant differences in the grapes and vines produced must be related to differences in the soil composition, humidity, and overall temperature. These parameters are directly linked to the different geomorphic positions of the sites. In detail, the geomorphology of the Lončarjevec vineyard defines: 1) vineyard cultivation techniques (terraced slope vs. non-terraced flat valley bottom), which mainly affect the depth of the soil profile and soil-nutrient washing. The terraced UM site has soil depths from 20 cm to 2 m, which allowed thorough tilling and good homogenization of the nutrients in the soil profile, while in the 5 m deep soil of the LM site the homogenization is not so good, because tilling could not reach deeper horizons of the soil; 2) drainage patterns (and thus soil humidity). This UM position allows better drainage conditions with excellent surface and subsurface drainage through flysch soils compared to the LM site; 3) microclimate, which affects the differences in thermoregulation of the sites (temperature in the individual rows of the vineyard). The UM site is located on the slope and enjoys stronger solar radiance, has a stronger evapotranspiration rate, and is less prone to frost than the LM site.