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Multivariate approach to highlight the effects of soil physical, chemical and microbial features on grape quality

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Recent literature suggests that soil features can strongly influence the grape, and then wine, characters not only within a wine district, but also within a farm or a vineyard. Although the role of soil hydrology played a basic role for grape features, soil chemistry and microbiology can also have important effects. This multidisciplinary work wants to assess, through a multivariate approach, the possible role of soil microbial communities on winegrape features. Indeed, the study investigated the multivariate relationships among soil features, soil microbial communities and grape quality (Sangiovese cv.) in 8 sites (4 vineyards) of Chianti Classico DOCG districts (Tuscany, central Italy), during three years (2012-13-14). The sites represent four typical terroir of Chianti Classico, which are: i) CALC- stony clayey soils, strongly calcareous, developed on clay-calcareous flysch; ii) SAND – stony sandy soils, non calcareous, developed on feldspathic sandstone; iii) MAR- loamy soils, with medium calcium carbonate, developed on marine sands of Pliocene period; IV) FLUV – loamy soils, with medium calcium carbonate, developed on ancient fluvial terrace. The vineyards have similar age (12-16 years) and belong to the same winery, which uses the same cultivar (Sangiovese cv.) and the same vine and soil management.
The overall results of the three years highlighted some significant relationships between grape quality and soil features, in particular gravel content, calcium carbonate, and rooting distribution. On the other hand, microbial richness seems to play a role on grape anthocyanins content, one of the most important index of red grape quality.