



Minerality in Sauvignon Blanc Part 3:

The romantic notion of soil minerals in wine...unromantically disproven

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[Basic Wine](#)

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Unlike virtually all other sensory attributes used to describe a wine, the word, “mineral”, is often taken to have a literal origin. Tasters reporting this descriptor claim to actually perceive the minerals that has been romantically transported from the rocks and soils, through the vine into the grapes ending up in the wine. Whether this is even possible is blissfully ignored by many.

A review article published by Parr and co-authors titled “[Minerality in wine: Towards the reality behind the Myths](#)” addressed this notion and deconstructed the concept of minerality¹. In today’s blog post, the realistic possibility of minerals being transported through the vine and literally tasted by the consumer, is summarised.

Geology vs Nutrient²

Minerals in soil are usually in the form of various chemical compounds complexed in intimately bonded crystalline structures. These solid, inorganic compounds are the physical minerals in the **geological** sense.

On the other hand, the minerals, that we all know are essential for the healthy growth of grape vines, are almost all single elements (mostly metals). For the vine to be able to take up the minerals and utilize it as a nutrient, it **needs to be dissolved in water in the form of cations**. These are the minerals in the **nutrient** sense.

Mineral uptake

So, what form of minerals does the vine take up via the roots? As mentioned previously, for the minerals to enter the vine's system, it needs to be dissolved in water in the form of cations. From a geological point of view, the **minerals are all locked into complex crystalline structures**. In nature, the release of minerals from geological origin is **too slow** to make a year-to-year contribution to vine health.

Therefore, the **main source of minerals in the soil is from the organic, humus component in the soil**³. If a nutrient/mineral imbalance occurs in the vine, it is usually corrected by the viticulturist in the form of fertiliser.

Other than that, the vine does not simply gobble up all the nutrients available to its disposal⁴. **The vine will take up nutrients as needed**. Therefore, the **amount and proportions of minerals in the soil will not relate to the amount and proportions of minerals in the vine and resulting wine**.

Minerals in the wine

Chemical deposits on ripening grapes due to irrigation and viticultural treatments can lead to a change the mineral content of the resulting wine. During vinification, the nutrient and **mineral content in the wine fluctuate due to various winemaking treatments, such as fermentation, additives (such as bentonite and sodium/potassium bisulfite), filtering, maturation and fining**⁵⁻⁷. **Contamination from winery plumbing, pollution and/or agrochemicals** can also significantly alter the mineral content in wine⁸.

The ultimate source(s) of minerals in the wine is uncertain especially considering the large impact of external factors. It is no surprise that the attempt to find a correlation between vineyard soil nutrient/mineral content and the perception of "mineral" in wine has been unsuccessful^{9,10}.

The concentration of minerals in wine

If the above facts are not convincing enough, consider the fact that the **mineral content in wine is miniscule**. Studies looking at the sensory perception of minerals in drinking water

found that the **human detection thresholds are higher than the concentrations found in wine**¹¹. The complex wine medium also contains a vast number of aromatic compounds which could easily mask any aroma attributed to minerals (in the unlikely case that the mineral content in the wine is above the reported threshold).

The flavour of rocks and minerals

As mentioned before, **geological material is not something that dissolves easily neither does it vaporise. It basically lacks taste and smell.**

The popular sensory reference of licking a rock or mineral does not relate to an aromatic sensation, but only a tactile one. **The taste perceived when licking a rock is probably due to rock salt (sodium chloride) leading to a salty taste.**

Could the minerality in wine be linked to salt in the soil? Perhaps, but in general, growers avoid salt in vineyard soils and grapevines also reject its uptake¹², so the **contribution of salt from the soil to perceived minerality is negligible.**

Salt

Perceived saltiness in wine is a growing topic of interest when it comes to minerality as multiple studies associated salty taste to minerality in wine¹³⁻¹⁶. As mentioned previously, higher concentrations of salt due to the uptake of minerals through the vine is highly unlikely. However, the **effect of sea breezes and coastal mist leading to salt deposits on ripening grapes** can have a significant influence on the salt content of wine.

A recent blog post by Malu Lambert titled "[Sauvignon of the sea](#)" highlighted South African wineries with close proximity to the sea and the prominent association with "minerality". Wine may contain atypical concentrations of sodium chloride (as high as 1000 mg/L rather than the usual 10 to 40 mg/L) if vineyards and wineries are situated in close proximity to the ocean. This can have a significant effect considering the detection threshold for sodium chloride in white wine reported to be around 570 mg/L¹⁷. The actual amount of salt deposited on the grapes and the amount of sodium chloride in the South African wines mentioned in Lambert's article were not measured and could make for a very interesting research project. More on sodium chloride in a future blog.

Conclusion

As Parr and co-authors conclude in their review article: “Minerality cannot be the taste of minerals, geological or nutrient, in any direct, literal way”.

This very unromantic debunking the myth that minerality is a long-treasured connection between wine and the land will have many a French winegrower up in arms. However, there might still be a happy ending to this fairy tale. The exact chemical compound(s) responsible for the perception of minerality still needs to be confirmed and a link to site specific properties could still be identified. However, as is the norm in wine research, the unknown mechanism is most likely more complicated than expected and the concept of minerality will remain enigmatic and controversial until more scientific evidence is published.

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