

What does wine taste of?

Grapes and wine appear to be strongly influenced by many factors of the environment in which they are produced. Debates can arise as to which, if any of these factors are predominant in producing the flavour of the wine.

One word that is invariably mentioned in connection with wine production is terroir. This is described as the combination of geography, geology and climate and human influence that interact to give the grapes their characteristics and thus give a specific character to the wine. The French, who first used the term, have a firm belief in terroir. According to its advocates, it is this that makes, say, the Chardonnay of the Champagne taste differently from those grown in California, or in Dorset. It is certainly apparent that where the soils are rich, the grapes appear to produce 'flabby' wines. Good wine grapes appear to come from soils where the vines have to fight for life- geological and climatic aspects that in turn, may affect the wine. It is also apparent that the microclimate of one valley in a region can produce different features in the wine from those in an adjacent location. However, in addition to these natural influences, it is the skill of the winemaker in choosing the type of yeast (including the ambient yeast), in blending, and in determining the length of maturation that also have major impacts on the final taste.

With all these factors influencing it, it is hardly surprising that each vineyard produces wines with a subtlety different flavour to those of the vineyard's neighbours - but what actually are those flavours? Wine tasters will sniff, slurp and spit with variable enthusiasm and will then pronounce that the wine has certain characteristics. Most tasters use a wide range of descriptors to describe wines in terms that they believe the target audience will understand. Pinot Noir for example can have the terms 'cherry, ripe tomato, barnyard, mushroom' attached to it. Reisling is often described as 'petrolly' and (when from Moselle) 'flinty' or **steely** – (*A word implies a crisp refreshing white that leaves an near metallic taste in the mouth*)(1)

Such descriptors as 'earthy', 'flinty', 'steely' and 'liquorish flavoured' appear in many descriptions with the implication that the soils of a particular site on which they grow has influenced this flavour. Is there any truth in such an implication?

Professor Alex Maltman of Aberystwyth University(2) has examined all the tasters' descriptions to see if any underlying rocks of the vineyards influence the flavour of the wine. His main conclusion is that by themselves, they do not.

His main reasoning is that the level of mineral present in any wine is far below that discernable by the human palate. Most of the minerals present in vineyards are apart from limestone, are insoluble. *The only significant exception is the halide mineral called halite (sodium chloride, salt) which, of course gives the sensation of saltiness on the tongue.* He notes that vineyards tend to avoid salty locations, probably for this very reason. The other sensation that we get from wine is smell, and very few minerals give off any vapours that are discernable.

Some scientists mentioned in the same paper have tried to see if other minerals are present in wine. Studies in Raimat (Spain) showed levels of zinc at 3 parts per billion (ppb) in red wine. The World Health Organisation has showed

that the taste detection level for zinc in tap water is 4ppm (i.e. a thousand times greater) and therefore this zinc could not be detected in the wine.

Where grapes have a high concentration of mineral or mineral-based substances, they could be dangerous. Prof. Maltman points out that if such concentrations were present, they would present a severe challenge to the wine maker and the resultant wine could be a risk to public health. Such substances include metals such as copper and iron, and residues from agro-chemicals.

So what can we taste in wine?

Professor Maltman suggests that what we can taste are substances known as mercaptans and methoxypyrazines that are compounds from the vine and which give the wine its flavour. These are noticeably present in Sauvignon Blanc, a wine to which the term ‘minerally’ is often applied. They also have an odour threshold of only 0.0001-0.0005ppb, so humans can smell them.

Many of the terms used by tasters are metaphorical. **Flinty** for example implies a sharp edge, not a reference to the presence of flint. Maltman points out that flint is a silica, as is the glass of the bottle and the glass in which it (briefly) resides. One could hardly affect it, if the other two did not. Similarly, the term ‘**earthy**’ is due, not to the soil, but to moulds and bacteria which have very low sensory thresholds.

One descriptor that he cites – applied to the Priorat wines of Spain - is that they appear to have a liquorish flavour. This could be a linguistic misunderstanding based on the local Catalan term for the rocks which is ‘llicorella’ - a slaty material. However, liquorish is, as he comments ‘*an aromatic phenylpropene called anethole, of biological origin. It is not clear how any geology might generate this substance in wine*’. He also notes that the Catalan word for liquorish is **regallessia** and the Spanish is **regaliza** (pronounced **lakoréle**) so possibly some Englishman, reading it, was confused between the geological term and the word for liquorish.

On the geological factor Professor Maltman agrees with the terroir-ists. He concludes that ‘*the soils that are able to yield most nutrients to the vine would seem most likely to imbue the wine with a high (nutrient) mineral content*’ This would be where there are very fertile soils near the surface. However he notes that minerality in wines is most associated with areas where the soils are infertile. In those areas, vines are putting down deep roots in order to find water and in that deep zone there are few soluble minerals for the roots to pick up and give taste to the grapes. However, he also notes that the anecdotal belief in ‘minerality’ may not be entirely unfounded. ‘*For example, it may be that the low nitrogen content of infertile soils leads to grape musts in which the yeast has to metabolise sulphur instead of nitrogen, and there has been much speculation that minerality may involve sulphur-bearing compounds*’

It would be interesting to examine any similar papers on others aspects of terroir and wine making in order to see how the different aspects of ‘terroir’ affect the wine and give a specific wine particular flavours and aromas. In the meantime we must accept the florid descriptions such as “*exotic, tropically-laden scent - with a fair measure of pungent rose petals and, in some of the most concentrated examples, a savoury element that some have likened to bacon fat.*”(3) and hope

that, as with Alex Maltman's findings, not all the descriptors used have too much basis in reality!

1) Web site- Logabottle.com – Wine taste descriptors

2) Minerality in Wine- a geological perspective

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3) JancisRobinson.com describing gewurztraminer