Influence of water quality on the presence of off-flavour compounds (geosmin and 2-methylisoborneol)

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Abstract

Geosmin and 2-methylisoborneol are off-flavour compounds related to poor organoleptics and a decrease in consumer satisfaction with drinking water. The relationship between these off-flavour compounds and 39 parameters of water quality (chemical, physical and biological) for three different surface waters from lotic systems that supply potable water to Quebec City and Lévis (Canada) was studied using principal component analysis. The objective of this study was to show that a multidimensional approach with principal component analysis using the component matrix serves to differentiate the processes involved in the appearance of the olfactory compounds from those not involved or little involved and to extract the most representative data of these processes. Our study shows that the presence of geosmin can be explained, in the case of the water studied, by a process associated primarily with the eutrophication of water and, to a lesser degree, by an allochthonous origin. However, the presence of 2-methylisoborneol may be linked to two processes with different origins, but of equal importance: a winter origin – most likely allochthonous – involving anthropic contributions and an autochthonous bacterial origin.

Keywords: Water quality; Drinking water; Off-flavour compounds; Geosmin; 2-Methylisoborneol; Principal component analysis