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BOOK OF ABSTRACTS

P10 - EXPLORING EXTRACTION DYNAMICS OF GREEN TEA VOLATILES BY PTR-TOF-MS

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Tea brewing is considered an art in some cultures and recommendations on temperature, brewing time, water to tea ratio or the number of times that tea leaves can be brewed highly depend on the tea type, region and personal preferences. The effect of those brewing variables in the kinetics of extraction for some non-volatiles has been studied (Spiro 1992, Price 1994, Astill 2001). In the case of volatile aroma compounds, previous studies have focused in the analysis of either the leaves or the final infusion but, to our knowledge, no work has been performed on the kinetics of tea volatiles extraction and how different brewing parameters can influence the final aroma. In this work, we exploited the high analysis speed of PTR-ToF-MS coupled to a direct headspace autosampler to determine aroma composition of the tea infusion over time.

Teas were brewed in triplicate at three different temperatures (60, 80 and 90°C), with two leaf shapes (full and broken leaves) using two different waters (soft and hard). All samples were brewed during 5 minutes and an aliquot was taken every 30 seconds for analysis.

Brewing conditions resulted in significantly different volatile composition of the samples (Figure 1). As general trend, concentration of aroma compounds in the tea infusion increases with brewing time and the brewing temperature although not all measured compounds were equally impacted by these parameters. Tea shape also significantly influenced the extraction of aroma compounds. Broken leaves were extracted faster at the beginning, but differences with full leaves were reduced with increased brewing times and most compounds were in the same range for broken and full leaves after 5 minutes brewing. Water

hardness was the only variable considered that resulted in no significant differences in extractability.

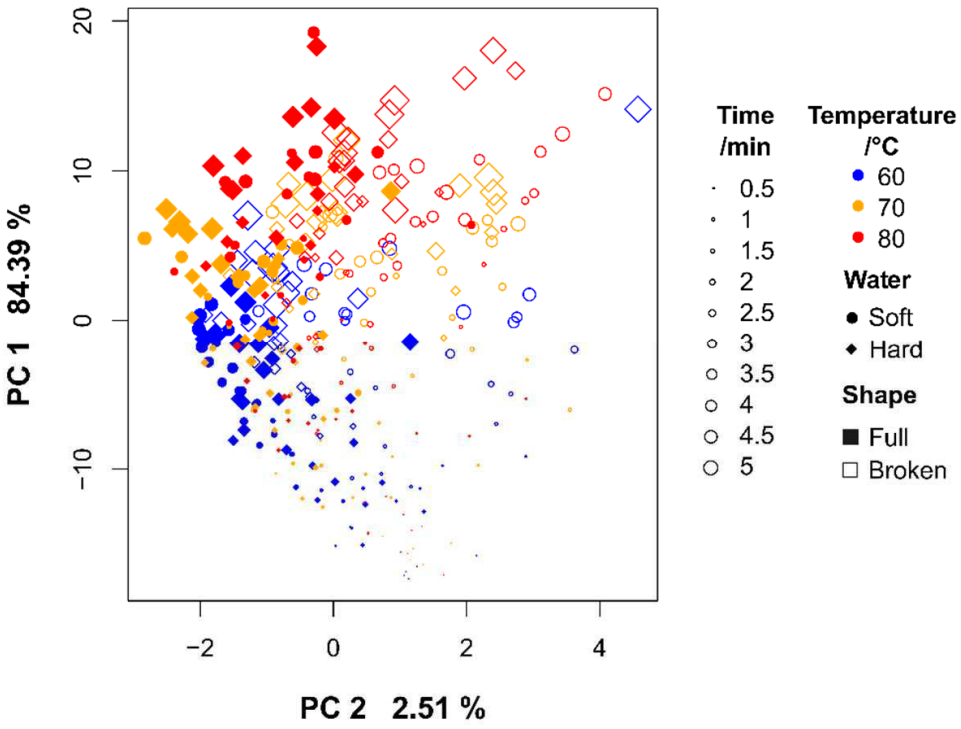

Figure 1. Principal component analysis performed with all the data points from this study. Interesting trends can be observed: time evolution of the extraction and increase of temperature along PC1, and partial separation of broken and full leaves on PC2

References

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