PharmacologyOnLine

2019 - Supplementary Issue - vol. 1, December 30

28° SILAE Congress

16th-20th of September, 2019

La Habana, Cuba

ABSTRACTS BOOK

ISSN: 1827-8620

PhOL 2019 - Supplementary Issue - vol. 1, December 30, 2019

Edited by

Maria D'Elia, Serena Rizzo, Luca Rastrelli

abstracts@silae.it, habana2019@silae.it

Journal of SILAE - Società Italo-LatinoAmericana di Etnomedicina Cibo e Salute

ISSN: 1827-8620

December 30, 2019

PharmacologyOnLine

ISSN: 1827-8620 PhOL 2019 - Supplementary Issue - vol. 1, December 30, 2019

Feasibility study on the potential of e-tongue in craft beer discrimination and nutracuetical description

Di Sanzo, R.[1], Carabetta, S.[1], Fuda, S.[1], Crea, G.[1], Russo, Mt.[1*]

[1]*Food Chemistry, Safety and Sensoromic Laboratory (FoCuSS Lab), University of Reggio Calabria, Via dell'Università, 25, 89124 Reggio Calabria, Italy*

mariateresa.russo@unirc.it

Introduction

Beer is the world's most widely consumed and probably oldest alcoholic beverages. It is the third most popular drink overall, after water and tea. Beer is obtained by fermentation of starch-rich wort from cereal grain, mainly malted barley, but also wheat, maize, and rice. Most beer is flavoured with hops, which add bitterness and act as a natural preservative. Other flavourings such as fruits or herbs may be included especially in craft beers. Beer alcoholic content is between 3 and 8% and can be considered a good source of polyphenols derived both from malt and hop. There is a wide variety of beers produced all over the world, however, there is an effort to differentiate and classify them taking into account both chemical composition and production techniques and mainly between commercial and craft beers.
In this work is presented a feasibility study on the potential of a potentiometric electronic tongue as a tool for fast discrimination of different styles of commercial and craft beers and of their nutraceutical characteristics.

Method

The E-tongue analysis were performed with the α-Astree electronic tongue (Alpha MOS company), that consisted of seven different liquid cross-selective potentiometric sensors (JB, BA, BB, HA, ZZ, CA and GA) (Alpha M.O.S.), an Ag/AgCl reference electrode (Metrohm, Ltd). The sensors used are chemically sensitive field-effect transistors (chemFET). Also, the physicochemical parameters color, pH, bitterness were measured. Measurements were carried out on three styles (blonde, red and weizen) of commercial and craft beer. All the obtained data were analyzed individually and then a data fusion was carried out.

Conclusion

There are some differential aspects in the composition and organoleptic characteristics among the different styles. Among the substances that contribute to beer characteristics, especially to color, there are a large number of active compounds which include polyphenolic compounds. Normally, most polyphenolic compounds, mainly phenolic acids, flavan-3-ol derivatives and flavone glycosides, come from malt and a residual part from hops. There is a relationship between the content of polyphenols and a relationship has

PharmacologyOnLine

ISSN: 1827-8620 PhOL 2019 - Supplementary Issue - vol. 1, December 30, 2019

also been established between free phenols and phenolic acids content and the antioxidant activity. Due to its antioxidant capacity and low alcoholic content, beer is able to improve plasma antioxidant activity and reduce the risk of cardiovascular diseases without the negative effects of high doses of alcohol.
PCA, an unsupervised statistical technique, was run on the data matrix of physicochemical and e-tongue sensors response to discriminate between craft and commercial beer and nutraceutical characteristics. The samples, craft and commercial beer, are clearly separated. The first and the second principal components account for 38,1% and 29,6% of the total variance, respectively. The main contribution to the first component is due to the pH and bitterness. Separation along the second principal component is mainly caused by the colour and two e-tongue sensor response (CA, HA). This work confirm the ability of biomimetic systems combined by robust statistical elaborations for discriminant model able to classify beer by styles and nutraceutical quality.

Acknowledgement: This work was financially supported by EU and Italian Ministry of Research - PNR 2015/2020(D.D. 1735 del 13.07.2017) Project ARS01_00582 *e-Brewery* and by Research Infrastructure Saf@med - Food Safety platform (PONa3_00016).

Bibliographic References

Cetó X. et al., 2013. Beer classification by means of potentiometric electronic tongue. Food Chemistry, 151, pp. 2533-2540
Rudnitskaya A. et al., 2009. Instrumental measurement of beer taste attributes using an electronic tongue. Analytica Chimica Acta, 646, pp. 111-118