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ABSTRACTS

5TH MEETING  
OF YOUNG RESEARCHERS  
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IJUP'12

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# CREDITS

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# Furanic compounds in *espresso* coffee capsules: validation of a HS-SPME –GC-MS methodology

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Furan and its derivatives are actually receiving increased attention due to their potential harmful effects on human health. They have been known to occur in thermally processed food and are mainly formed from thermal degradation of carbohydrates, specially reducing sugars. In nature, 2-furfural, furfuryl alcohol and furfuryl ester occurs naturally in many foods and drinks, such as coffee. Nowadays; due to the increasing of the consumption of *espresso* coffee capsules, it became of extremely importance to evaluate the potential harmful compounds present in this type of beverage. In literature there are many articles related to the screening and quantification of furan, but quantification of furanic compounds in *espresso* coffee is still scarce [1-3]

The aim of the present work was to develop and validate a HS-SPME-GC-MS methodology for the simultaneous quantification of the four major furanic compounds in *espresso* coffee capsules, namely, 2-furfural, 2-furfuryl alcohol, 5-methylfurfural and furfuryl acetate. For this purpose, a Headspace – Solid phase microextraction coupled to Gas Chromatography – Mass Spectrometry method was validated. Quality parameters of the method were established, Good linearity with a correlation coefficient ( $r_2$ ) higher than 0.99 was obtained, and low LODs (0.0008 mg L<sup>-1</sup> for 2-furfural, 0.0026 mg L<sup>-1</sup> for furfuryl alcohol, 0.00079 mg L<sup>-1</sup> for 5-methylfurfural and 0.000018 mg L<sup>-1</sup> for furfuryl acetate) and LOQs (0.00232 mg L<sup>-1</sup> for 2-furfural, 0.00767 mg L<sup>-1</sup> for furfuryl alcohol, 0.00238 mg L<sup>-1</sup> for 5-methylfurfural and 0.00015 mg L<sup>-1</sup> for furfuryl acetate) were achieved. The recoveries of furanic compounds were 91.04% for 2-furfural, 97.92% for 2-furfuryl alcohol, 102.13% for 5-methylfurfural and 101.99% for furfuryl acetate. Relative standard deviation (RSD, %) was lower than 5% for intraday assays and lower than 10.6% for interday assays. The results show that a quantitative analysis of the four major furanic compounds in coffee is of extremely importance, due to their possible harmful effects that could be related with dose intake. Considering the high consumption levels of *espresso* coffee by Portuguese population, these compounds should be also monitored and quantified in other processed foodstuffs.

In conclusion, this work allowed for the first time the development and validation of a HS-SPME-GC-MS method for the simultaneous quantification of 2-furfural, furfuryl alcohol, 5-methylfurfural and furfuryl acetate in *espresso* coffee samples.

## References:

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