COFFEE TERPENES: EXTRACTION AND SELECTION OF FUNCTIONAL MONOMERS

Ana Oreški,[a] Federico Berti,[a] Cristina Forzato,[a] Luciano Navarini.[c]

[a]*Dipartimento di Scienze Chimiche e Farmaceutiche, Università degli Studi di Trieste, via L. Giorgieri 1, 34127 Trieste*
[b]*School of Biological and Chemical Sciences, Queen Mary University of London, Mile End Road, London E1 4NS, United Kingdom*
[c]*illycaffè S.p.A., via Flavia 143, 34100, Trieste*

Coffea canephora and *Coffea Arabica* are industrially the widest used species of coffee. The price of *C. arabica* is, due to its high quality, nearly twice the price of *C. canephora*[1], and this increases the frequency of fraudulent behaviour, influencing the quality of the end product. To avoid it, a simple way to distinguish between the two species is desired. Studies have shown an interesting deviation between the contents of various diterpene molecules in the coffee oil extracted from the beans of both plants. As such, cafestol and its derivative 16-O-methylcafestol (Figure 1) are pentacyclic kaurane diterpenes specifically found in coffee beans and brews. Cafestol is contained in the beans of both species, whereas 16-O-methylcafestol is found only in the beans of *C. canephora* and thus accepted as a specific marker.[2]

Figure 1. Structural formula of cafestol (left) and 16-O-methylcafestol (right).

The only difference between cafestol and 16-O-methylcafestol is the methoxylated hydroxyl group on the atom C_{16} of 16-O-methylcafestol. As MIP technology provides us with the possibility of creating a polymeric system with highly specific molecular recognition properties,[3] we predict that creation of MIP-based sensors could lead to a sufficient differentiation between the two molecules. Given the characteristics of the functional groups, we decided upon the covalent approach to molecular imprinting. In cafestol both vicinal hydroxyl groups can be esterified, whereas in 16-O-methylcafestol it is possible to esterify the hydroxyl group and form a π-methyl interaction between an aromatic ring and the methoxylated group. To this purpose, proper monomers must be selected and an optimal solvent must be used. In this poster we will present the process of isolation of both diterpenes and introduce the process of creating a library of possible monomers in possession of all of the desired characteristics to be used for the preparation of molecularly imprinted polymers.

References

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