

Unmasking admixtures of extra virgin olive oils with olive oils containing sensory defects using a multi-sensor taste device

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Olive oils may be graded according to its overall physicochemical composition and sensorial attributes as extra-virgin (EVOOs), virgin (VOOs) or lampante olive oils (LOOs). Since olive oils are a food product quite prone to frauds, protection legal regulations have been implemented by the European Union Commission [1], which take into account the levels of chemical and physicochemical parameters (e.g., free acidity, peroxide value, UV extinction coefficients and alkyl esters content) as well as sensory evaluation (presence/absence of organoleptic defects and the positive fruity sensation) [2]. Unfortunately, the admixture of expensive olive oils with low quality oils aiming fraudulent economic revenue is still a common practice difficult to detect using the official methods.

In this work, it is evaluated, the capability of a lab-made potentiometric electronic tongue (Figure 1) for assessing blending levels of adulterated extra virgin olive oils with low quality olive oils for which an intense sensory defect could be perceived.

The preliminary results pointed out that the taste sensor device, together with chemometric tools (e.g., linear discriminant analysis coupled with simulated annealing variable selection algorithm) could be successfully applied to semi-quantitatively discriminate olive oils with a blend level lower or equal to 2.5% from those with higher adulteration percentages (correct classification rate greater than 82%±10% for cross-validation procedures). Thus, these results showed the practical potential of the E-tongue as a taste device for the successful detection of EVOOs adulterated with LOOs containing organoleptic defects.

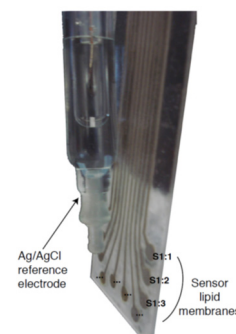


Figure 1: Lab-made E-tongue device.

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