

E-tongue: Multisensor device for taste assessment of tea

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E-tongue is a multisensory device dedicated to automatic analysis of liquid samples. It is based on an array of tiny synthetic membranes built on a single silicon chip, called a multisensory. It has been reportedly used to obtain data for astringency of tea. This involves detection of polyphenols (theaflavins) and predicting other sensory attributes using potentiometric chemical sensors along with pattern recognition technique. Taste sensation is result of physico-chemical interactions of food molecules with a complex system of hundreds of cell buds located randomly all over the tongue. However, the results of sensory test are usually affected by some subjective factors such as emotion, exhaustion, habits and physiological conditions. It takes years of experience to acquire the skills of quality evaluation of tea. The electronic tongue provides a rapid, inexpensive and objective method to assess the quality of tea. Moreover, the aroma of tea changes from season to season, and even small differences can significantly affect the prices of tea. Overall experience is best done by human but the minute difference of taste is difficult to understand by human brain or need very skilled tea tasters. The electrodes of electronic tongue were immersed in tea and a voltage applied across the electrodes. The current levels determine the concentration of theaflavins in the tea, which in terms express the astringency or taste of tea. E-tongue software produces the data through graphical modeling.

Tea quality assessment is a difficult task because of the presence of innumerable compounds and their diverse contribution to tea quality. As a result, instrumental evaluation of tea quality is not practiced in the industry. India's tea industry — both cultivators and manufacturers — have always relied on the palates of skilled and experienced tea tasters to assign quality scores to tea which determines the prices at which tea is sold and bought. There had been a very few reports where an electronic tongue has been used for the discrimination of taste of tea samples.

The electronic tongue is based on the principle of pulse voltammetry and consists of an array of five working electrodes along with a counter and a reference electrode. The voltage equivalent of the output current from between the working electrode and the counter-electrode generated out of the tea liquor when excited with pulse voltage between the working electrode and the reference electrode has been considered for data analysis. Different pattern recognition models based on neural networks are investigated to carry out a correlation study with the tea tasters' score of five different clones of Darjeeling black orthodox tea samples obtained from a tea garden of Tea Board of India. It was observed that the results of sensory panel and the e-tongue were very consistent.

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Effect of drugs, hormones and synthetic compounds on eatables

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In this era of wonder drugs, hormones and synthetic compounds, it may seem an anachronism to consider therapeutics based primarily on the use of plants, vegetables, fruits and grains. But is it really so? There are numerous disorders that can be prevented and treated by consuming natural foods like fruits rich in minerals, vitamins, trace elements, vital nutrients and other substances like phytochemicals which have positive medicinal and curative properties. Presently the whole world is emphasizing on malnutrition, food safety and health security. Several programmes have also been launched in this regard. The year 2008-09 was declared as the "Food Safety and Quality Year" by the Government of India. Most fruit sellers use calcium carbide for ripening the fruits. Calcium carbide is extremely hazardous to the human body as it contains traces of arsenic and phosphorus. It is banned in many countries of the world, but it is freely used in India, Pakistan, Bangladesh, Nepal and other countries.

Thus we are at risk of short-term and long term health effects simply by eating fruits that are induced to ripen.

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