

# Evaluation of *Coffea arabica* and *Coffea canephora* Beverages Using Electronic Tongue (ET)

E.S.M. SANTOS<sup>1</sup>, L.G. PATERNO<sup>2</sup>, F.J. FONSECA<sup>2</sup>, L.H.C. MATTOSO<sup>3</sup>,  
D.D.G.C. FREITAS<sup>4</sup>, R. DELIZA<sup>5,6</sup>

<sup>1</sup>Federal Rural University of Rio de Janeiro, Seropédica – RJ, Brazil

<sup>2</sup>Department of Electronic Systems Engineering – EPUSP, São Paulo – SP, Brazil

<sup>3</sup>Embrapa Agricultural Instrumentation, São Carlos – SP, Brazil

<sup>4</sup>Embrapa Food Technology, Rio de Janeiro – RJ, Brazil

<sup>5</sup>Embrapa Labex Europe, <sup>6</sup>Inra, UMR CSGA, Dijon, France

## SUMMARY

Sensory analysis carried out by trained assessors has been used in the assessment of coffee beverage in order to get sensory profile and avoid weaknesses inherent of the traditional classification system named of the "cup proof". However, it is desirable to find instrumental measures that correlate with sensory ones, and use the instrument as a routine analysis of a laboratory quality control. The electronic tongue (ET) may be an option. It consists of an innovative tool which allows assessing coffee beverage, enabling agility, and precision, high sensitivity at low cost. Therefore, the ET can be an effective alternative for analysis of coffee beverage. The aim of the present study was to evaluate blends of Arabica and Conilon coffee and their pure beverages by instrumental method of ET. The Arabica and Conilon beans were roasted, ground and samples were prepared at the Laboratory of Sensory and Instrumental Analysis of Embrapa Food Technology (Rio de Janeiro – Brazil), using the following proportions of Conilon: 0 (100% Arabica), 10, 20, 40, 60, 80 and 100%. The ET analyses were performed by the Molecular Electronics Group, USP, São Paulo - Brazil. The beverages were prepared with boiled mineral water at a concentration of 1% (1 g of ground coffee in 100 ml of mineral water), and were analyzed by ET which was compound of 10 polymeric sensors (films of conductive polymers) at 25 °C. The data were obtained in the form of a matrix and processed by Principal Component Analysis (PCA). The results showed that the ET discriminated extracts of coffee according to the proportion of Arabica and Conilon beans. ET could well discriminate the samples 100%, 80% Conilon and samples with higher proportions of Arabica. The breakdown of the sample with 100% Arabica was perfectly observed, however, despite this discrimination, the blends with 90, 60 and 40% Arabica were similar to each other, indicating that from 40% Arabica in the blend ET considered the samples as equals. The ET allowed in a short time to discriminate between two different varieties of coffee (Arabica and Conilon). Therefore, further studies are recommended to achieve better results and provide an appropriate instrumental method for the evaluation of blends of Arabica and Conilon.