

Application of Electronic Nose Coupled with Chemometric Tools for Evaluating the Quality of Black Tea

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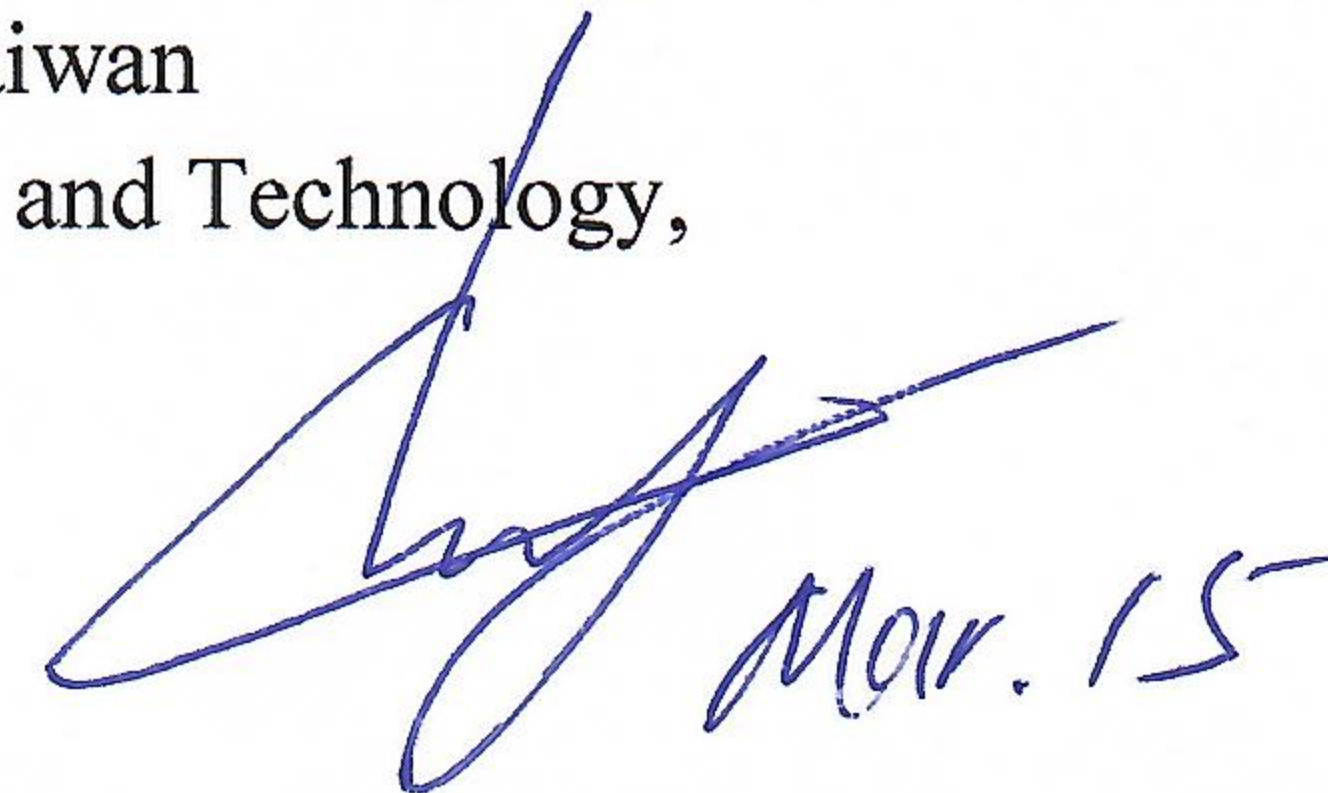
Abstract

The understanding of facts related to tea, consumer acceptability, and maintaining high quality for marketing and processing is highly essential. Therefore, in this study, the quality identification of different black teas were investigated using electronic nose (E-nose) via using different metal oxide semiconductor gas sensors and morphological attributes. Further, the performance of E-Nose on samples was checked using multivariate supervised statistical methods using support vector machine (SVM), principle component analysis (PCA), cluster analysis, K-fold cross validation methods and computer vision system (CVS). The results pointed out that the E-nose-SVM-linear model allowed 100% of correct predictive classifications of the samples according to their quality levels. The clustering nature (PCA plot) and classification accuracy (10-fold cross-validated based on KNN) have improved (accuracy 99.75%) with the applied method on the combined data. Also, SVM results of both E-nose and CVS was effective with the classification accuracy rates of 100% for training and testing sets.

Keywords: Aroma, Identification, Principal component analysis (PCA), Support vector machine (SVM)

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