

Discrimination of Korean tobacco's aroma and tastes using the electronic nose/tongue and their feasibility in tobacco sensory evaluation

Whan-Woo Lee, Seung-yong Lee, Hyun-Joo Shon and Young-Hoh Kim
KT&G Central Research Institute

In tobacco sensory evaluation, sensitivity, repeatability, reproducibility, tiredness and subject's condition are very important factors for reliability. The human sensory result is frequently a non-linear or non-sensitive response to the tobacco. So we present the electronic nose and tongue systems to supplement human sensory evaluation of tobacco. The purpose of this study is the discrimination of different tobacco types by e-nose/tongue and the analysis of what human sensory attributes are correlated with e-instrument's sensors. Samples are five groups of Korean domestic tobacco leaves, aged burly and not aged, aged flue-cured and not aged and blending types of the four. Sensory attributes of tobacco tastes are impact, irritations, bitterness, hay-like, tobacco taste, smoke volume, smoke pungent and mouth clean. Tests were conducted to discriminate characteristics among different tobacco samples by e-nose(α -Fox 4000) and e-tongue(α -ASTREE). Sensory evaluation was performed by verified trained panel. Correlation between the human data and the e-instrument data was statistically analyzed by the STATISTICA software. Discrimination can be achieved using principal components analysis (PCA) and discriminant factorial analysis (DFA). As a result, impact, bitterness, irritations, smoke volume and smoke pungent of human sensory attributes were specifically correlated with data from the several clustered e-nosesensors($p < 0.10$). PCA plot by e-nose showed that aged tobacco and not aged were discriminated and DFA plot showed that three groups

(aged burly, not aged burly and flue-cured) were discriminated. And also we can find bitterness, irritations, and smoke pungent of human sensory attributes were correlated with data from the e-tongue sensors($p < 0.10$). PCA plot by the e-tongue showed that flue-cured tobacco was separated from burly. Results have shown that the e-nose and the e-tongue are sensitive enough to distinguish among tobacco types and their several sensors are reacted to the human sensory attributes. And that become a reasonable basis to supplement human sensory evaluation of tobaccos being tested delicately and repeatedly.