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Selection of Aroma Components to Predict Sensory Quality of Kenyan Black Teas Using a Genetic Algorithm for Multiple Linear Regression Models

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A genetic algorithm (GA) was applied to optimizing sets of aroma components in black teas for calculating multiple linear regression (MLR) models to predict sensory scores. Selections of components were performed so as to maximize the coefficients of determination (R^2) based on three and four components. True optimum combinations of components seemed to be found by GA because almost the same components were repeatedly selected by optimization starting from randomized conditions. Comparing R^2s calculated from stepwise MLR and GA-MLR, the predictability of GA-MLR was generally superior over those from stepwise MLR. Although GA-MLR requires a much longer time than that for stepwise MLR, the time is much shorter than those required for all possible regression methods. (*E*)-2-hexenal, (*Z*)-3-hexen-1-ol, linalool and α-cedrene tended to be selected by GA-MLR while 1-penten-3-ol, linalool oxide (*trans* furanoid), (*E*,*E*)-2,4-heptadienal, *α*-cedrene were selected by stepwise MLR.

Keywords: black tea aroma, genetic algorithm, multiple regression analysis, chemometrics

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