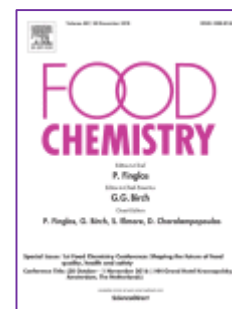


Computational intelligence applied to discriminate bee pollen quality and botanical origin



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Abstract

The aim of this work was to develop computational intelligence models based on neural networks (NN), fuzzy models (FM), and support vector machines (SVM) to predict physicochemical composition of bee pollen mixture given their botanical origin. To obtain the predominant plant genus of pollen (was the output variable), based on physicochemical composition (were the input variables of the predictive model), prediction models were learned from data. For the inverse case study, input/output variables were swapped.

The probabilistic NN prediction model obtained 98.4% of correct classification of the predominant plant genus of pollen. To obtain the secondary and tertiary plant genus of pollen, the results present a lower accuracy.

To predict the physicochemical characteristic of a mixture of bee pollen, given their botanical origin, fuzzy models proven the best results with small prediction errors, and variability lower than 10%.

Keywords

Bee pollen; Physical–chemical parameters; Botanical origin; Neural networks; Fuzzy modelling; Support vector machines