P 298

OPTIMIZATION OF A-AMYLASE PRODUCTION OF *ASPERGILLUS FOETIDUS* FROM BUG-DAMAGED WHEAT USING ARTIFICIAL NEURAL NETWORKS

H. M. Velioğlu[1*], G. Çelikyurt[2]

[1)] Namık Kemal University, Faculty of Agriculture,
Dept of Agricultural Biotechnology, Tekirdağ, Turkey
[2)] Namık Kemal University, Faculty of Agriculture,
Dept of Food Engineering, Tekirdağ, Turkey

α-amylase production of *Aspergillus foetidus* in submerged cultivation media including bug-damaged wheat, an agricultural waste, was optimized using both response surface methodology (RSM) and feed forward artificial neural networks (ANN). Firstly, experimental design of the study was done with RSM. The range levels of three independent variables (i) temperature (28-32 ^{o}C), (ii) fermentation time (5-7 days) and (iii) bug-damaged wheat ratio in cultivation media (1-5%) were investigated. According to central composite design, six replicates at the center points and a single run for each of the other combinations, 20 runs were performed in a completely random order. Secondly, 75 different experiments were done for 5 different temperature, 3 different time and 5 different bug-damaged wheat ratio points of which the intervals given above. ANN was fed with 3 inputs namely temperature, time and wheat ratio, consisting 3 hidden neurons and one output representing the final α-amylase activity in the submerged cultivation medium. There were 95 different experiment points for ANN modeling and data obtained 55 out of 95 cultivation was used for training, 20 for validation and 20 for testing the network. The results obtained from ANN were compared with that measured with analytical method for enzymatic activity. There was strong correlation between the result was found with *R* value of 0.967 for enzymatic activity. As a result, bug-damaged wheat was found as good source for α-amylase production under optimized conditions.

Keywords: α-amylase, *Aspergillus foetidus*, artificial neural networks, optimization

* Corresponding author: mvelioglu@nku.edu.tr