**Reference: [JSCS 9367]**

**Title: Prediction of denitrification capacity of alkalotolerant bacterial isolates from soil - an artificial neural network model**

**Reviewer I:**

Does the manuscript contain enough significant original material?: yes

Is the manuscript clearly and concisely written?: yes

Are the conclusions adequately supported by the data?: yes

Does the manuscript give appropriate credit to related recent publications?: yes

Are the references appropriate and free of important omissions?:  yes

Is the length of the manuscript appropriate?: yes

Does the manuscript need condensation or extension?: no

Is the quality of the figures (including legends and axes labelling) satisfactory?: yes

Are the nomenclature and units in accordance with SI?: yes

Are the English grammar and syntax satisfactory?: yes

AUTHORS: The authors would like to thank the Reviewer for professional and helpful comments. It is obvious that the Reviewer is an expert in this field. The reviewer`s comments contribute to a better quality of the paper that was submitted. All remarks are accepted and paper is changed according to these comments.

**ADDITIONAL COMMENTS**

Please indicate the page numbers for suggested corrections.

AUTHORS: Page numbers are added to the text, according to the Reviewer's suggestion.

**REPORT:**

In this manuscript, the prediction ability of artificial neural networks for denitrification capacity and bacterial behavior of newly isolated bacterial strains during the denitrification process was investigated. The results are correctly presented and should be of interest to the scientific community, especially when having in mind the actuality of the topic. However, there

are some points that need to be revised before publication.

Line 113: Some details on the multi-layer perceptron model should be provided for readers less familiar with the topic.

AUTHORS: A few sentences were added to the Manuscript, according to the Reviewer's comment.

Line 116: Which normalization method was applied?

AUTHORS: Min-max normalization strategy was applied, according to the StatSoft Statistica's default. This normalization strategy is a linearly transformation of x: y(x)= (x-min(X))/(max(X)-min(X)), where min and max are the minimum and maximum values of x in X, X is the set of observed values of x.

Line 157: The word ’complex’ should be omitted.

AUTHORS: This term was corrected, according to the Reviewer's comment.

Table I: The acronym ’SD’ should be explained.

AUTHORS: The term SD was explained, according to the Reviewer's comment.

Table III: Standard deviation was abbreviated as ’SD’ in Table I. This should be uniformed.

AUTHORS: Thank You very much for this observation. Corrected, according to the Reviewer's comment.

Results and discussion - The discussion should be strengthened by exploring and explaining the significance of the results obtained in the study. This could be added as a separate paragraph at the end of the Results and discussion section or could be included in the appropriate parts of this section.

Conclusion – A relatively small number of isolates was used for experimental verification of the predictions obtained by an artificial neural network. A higher number of samples should be used in the future to yield some statistically valid information on the prediction ability of the network. This should be addressed in this section.

AUTHORS: The Authors wish to express their gratitude for the Reviewer's observation. The ANN model results were compared to the experimental results, and the verification results were presented in Table II and Table III. The predicted values were very close to the desired values in most cases, which confirms the adequacy of the ANN model (mathematical verification).

Furthermore, the gained experimental results for 4 chosen bacterial isolates (out of 43 bacterial isolates evaluated in the experiment) were compared with predicted results for two previously untested incubation time points (36 and 60 hours), in order to perform the experimental verification of the ANN model. These four bacterial isolates were chosen as representatives of each isolation group (I-IV), according to their temperature and pH biokinetic zones (explained in our previous article Šovljanski et al., J. Sci. Food. Agric. 100 (2019) 1155).

One of the main advantages of the mathematical methodology is a reduced number of experimental runs that provide sufficient information for statistically valid results. The developed model describes the effects of the test variables on the observed outputs, enabling the experimenter to make efficient exploration of the process (Hajnal et al. (2016). Possibility of *Alternaria* toxins reduction by extrusion processing of whole wheat flour, Food chemistry 213, 784-790. https://doi.org/10.1016/j.foodchem.2016.07.019).

In my opinion, this manuscript should: be published after minor revision without additional review

If manuscript is suitable for publishing, referee’s recommendation: Original scientific paper

AUTHORS: Thank You very much for the helpful comments and goodwill to help us to improve the Manuscript, according to the rigorous standard of the Journal of the Serbian Chemical Society