Prof. Menka Petkovska

Editor,

Journal of the Serbian Chemical Society

Title: "Extraction of chlorophyll from pandan leaves using ethanol and mass transfer study",

Dear Prof. Petkovska

We are very grateful for your email of March 2, 2017 regarding our above mentioned paper that was submitted to Journal of the Serbian Chemical Society for the second review. We would like to express our great thanks and gratitude for the valuable comments on our manuscript. We have taken into consideration all comments that were raised by the reviewers in the revised manuscript. Our itemized response to their comments is listed below. We do hope that the revised version with “red font” will come to your satisfaction.

Thanks for your attention. We do hope to hear positively from you soon.

Best Regards,

M.D. Putra, Corresponding author, on behalf of the coauthor

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Response to Reviewers

**Reviewer A:**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?:        yes
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?:        no

ADDITIONAL COMMENTS
Please indicate the page numbers for suggested corrections.
Please, be as specific as possible if major correction by the author(s) is recommended! :

Part related to the mathematical model should be broaden in accordance with
the major remark given in the report.

REPORT:
        The Manuscript deals with the extraction of chlorophyll from pandan leaves. The influence of temperature and agitation speed on the equilibrium concentration in the system was investigated. Optimal extraction conditions were established.  Mass transfer coefficients were calculated using simplified mathematical model which neglected internal mass transfer and change in chlorophyll concentration in the particle. Based on the obtained mass transfer coefficients, dimensionless analysis was performed. The experimental data presented is of interest for publication. However, there are considerable remarks related to the model and the text submitted, so it is not possible to accept the manuscript in this form.

Response: We are very grateful to the reviewer for his thorough reading and valuable comments and suggestions. Please find below our itemized response to the comments. Changes have been in the revised manuscript in red font.

INTRODUCTION: The first paragraph of the Introduction should be rewritten in order to have more sense. The last sentence should be more precise (this pigment?).

R1: The first paragraph has been revised to enhance readability in the revised manuscript (Lines 24-29)

Line 33. – please put leaf instead of leave

R1: The word “leave” has been changed to “leaf” (Line 32). We do thank the reviewer.

Lines 33 and 34 - Should be  plural: alkaloids, saponins....

R2: The said words have been changed to plural (Lines 32-33).

EXPERIMENTAL:
I - in the Mass transfer coefficient part I strongly disagree with the statement (lines 82-84): “Since the size of the leaves (SHOULD BE PARTICLE SIZE INSTEAD OF THE SIZE OF THE LEAVES)  used in this study is very small, the internal diffusion (or mass transfer) of chlorophyll in the solid phase can safely be neglected.” because of the following:
1.      Particle size of 0.7 mm is not very small at all in the extraction process of natural matter
2.      A lot of data exist in literature on diffusion and mass transfer coefficients in different extraction processes in cases of even smaller particle sizes of plant material. So, according to my opinion, the authors could write that in their mathematical model the internal resistance to mass transfer was neglected. Some comparison of internal and external (film) mass transfer coefficients from the literature is highly desirable, or citing the studies with the same simplification (neglecting the internal mass transfer resistance).

Response: We thank the reviewer for his/her highly important observation. The statement has been corrected and citations have been added as suggested by the reviewer. We have also written an explicit statement (Line 92) that says “neglecting the internal mass transfer resistance”. A more elaborate discussion has been provided and citations were added in the revised manuscript as follows:

It has been reported that grinding into smaller particle size facilitates the mass transfer of chlorophyll within the solid phase that could result in negligible internal diffusion. 1 Sulaiman et al. 2 used three particle sizes (0.5, 0.7 and 1.2 mm) to compare the yield of oil extracted from solid coconut waste. The obtained yields were relatively close to one another; the smallest size gave an only 0.9 % higher oil yield. A negligible internal mass transfer resistance for all sizes was furthermore observed. In another study on the extraction of oil from Jatropha seeds, 3 three particle sizes (<0.5 mm, 0.5-0.75 mm and >0.75 mm) have been used. The optimum condition was obtained for particle size in the range 0.5-0.75 mm. Moreover, particle size below 0.5 mm suffered from agglomeration problems that reduced the effective surface area. (Lines 82-91)

1. M. T. Fernández-Ponce, B. R. Parjikolaei, H. N. Lari, L. Casas, C. Mantell, E. J. Martínez de la Ossa, Chem. Eng. J. 299 (2016) 420

2. S. Sulaiman, A. R. Abdul Aziz, M. Kheireddine Aroua, J. Food Eng. 114 (2013) 228

3. S. Sayyar, Z. Z. Abidin, R. Yunus, A. Muhammad, Am. J. Appl. Sci. 6 (2009) 1390

Line 81 – should be: solid and liquid phase

Response: The sentence has been corrected in the revised manuscript (Line 81).

Line 82 - Please use the expression: particle size, instead of: size of the leaves

Response: The expression “particle size” has been used to replace “size of leaves” in the revised manuscript (Lines 83, 90)

Line 86 – R, A, V, t and C are missing in the NOMENCLATURE

Response: The terms are now defined in the nomenclature (Lines 249, 250, 256, 257, 259)

RESULTS AND DISCUSSION:

Lines 120 and 121: “It assertively declined the resistance between phases.” Resistance between phases? Please reformulate.

Response: The sentence is clarified in the revised manuscript (Line 127)

Line 141: please reformulate the sentence in order to omit to expression "resistance between phases"
Response: The sentence is clarified in the revised manuscript (Line 147)

MAJOR REMARK: In Eqs. 2-5, concentration of chlorophyll at the at the solid-liquid film interface CL\* is considered to be constant. Is this true? This simplification should be added to the model description. Data on the chlorophyll content in leaves and % which makes the extracted amount should be provided.

Response: As rightfully stated by the reviewer, the CL\* is a constant value. The value was determined at equilibrium conditions. The equilibrium was evaluated when the value of CL was almost constant with time; hence, at this time the value of CL\* equals CL. We have added this clarification in the revised manuscript and the reference was also added (Lines 98-99). We do thank the reviewer for this comment that helped in improving the revised version of this manuscript.

In my opinion, this manuscript should:
        be published after major revision and additional review

If manuscript is suitable for publishing, referees recommendation :
        Original scientific paper

**Reviewer B:**
Does the manuscript contain enough significant original material?         yes
Is the manuscript clearly and concisely written?         no
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?:        no

ADDITIONAL COMMENTS
Please indicate the page numbers for suggested corrections.
Please, be as specific as possible if major correction by the author(s) is recommended! :
        All comments are in attached file.
REPORT:
        All comments are in attached file.

In my opinion, this manuscript should:
        be published after major revision and additional review

If manuscript is suitable for publishing, referees recommendation:
        Original scientific paper

We are very grateful to the reviewer for his/her valuable comments and corrections that were included in the manuscript. Please find below our response. Corrections are made into the revised manuscript in RED font.

Comment n1:

Response n1: The word “speed” has been added in the revised manuscript. (Line 11)

Comment n2: Must be in plural

Response n2: The words have been written in plural. (Lines 32 – 33)

Comment n3: English must be corrected

Response n3: The sentence has been rephrased in the revised manuscript. (Lines 37-39)

Comment n4: English must be corrected

Response n4: The sentence has been rephrased in the revised manuscript (lines 51-53)

Comment n5: agitation speed

Response n5: The word “speed” has been added in the revised manuscript. (Line 64)

Comment n6: English must be corrected

Response n6: The sentence has been rephrased in the revised manuscript. (Lines 64-65)

Comment n7: English must be corrected

Response n7: The sentence has been rephrased in the revised manuscript (Line 81) as suggested by reviewer A.

Comment n8: correct bracket

Response n8: The bracket has been rephrased in the revised manuscript (between lines 97 and 98). Many thanks for the observation

Comment n9: It must be explained how CL\* was determinated.

Response n9: The value of CL\* was determined at equilibrium conditions. The equilibrium was evaluated when the value of CL was almost constant with time; hence, at this time the value of CL\* equals CL. We have added this clarification in the revised manuscript and the reference was also added (Lines 98-99). We do thank the reviewer for this comment that helped in improving the revised version of this manuscript.

Comment n10: English must be corrected

Response n10: The sentence has been rephrased in the revised manuscript (lines 117-118)

Comment n11: English must be corrected

Response n11: The sentence has been rephrased in the revised manuscript. (Lines 129-130)

Comment n12: higher

Response n12: The word has been corrected. (Line 148)

Comment n13: The peaks on the diagram are not well explained. It was also remark on first revision!

Response n13: The description has been modified to show the significance of the two main peaks and how the intensity of the peaks relates to crystallinity of cellulose (Lines 169-175). In the extracted sample, the intensity is higher. Typical results were obtained and explained by other investigators, e.g.

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| Kaitao Zhang, Peipei Sun, He Liu, Shibin Shang, Jie Song, Dan Wang, Carbohydrate Polymers 138 (2016) 237–243 | Hua-Min Liu, Fei-Yun Wang, Yu-Lan Liu, Food Chemistry 202 (2016) 104–109 |

Comment n14: ????

Response n14: We thank the reviewer for this observation. It is a mistake of placement of reference due to use of endnote. It has been deleted in revised manuscript.

Comment n15: Schmidt mixing number does not exist. Just Schmidt number

Response n15: We do agree with reviewer regarding Schmidt number. The word “mixing” has been deleted in the revised manuscript. (Line 217)

Comment n16: Schmidt mixing number does not exist. Just Schmidt number

Response n16: We do agree with reviewer regarding Schmidt number. The word “mixing” has been deleted in the revised manuscript. (Line 223)

Comment n17: This is not done properly

Response n17: The sentence and figure caption have been rephrased. (Lines 229-231 and Lines 235-237)