Dr Bojana Obradović

Hemijska Industrija

Subject: Submission of revised paper (ID number: 494)

Dear Dr. Obradović,

First of all, we would like to express gratefulness and sincerely thank You and the reviewers for such thoughtful comments and suggestions.

We took some time to carefully review them and to revise the manuscript accordingly. All of the reviewers’ suggestions have been accepted. The comments of each reviewer are listed below, with our response (clarification and changes we made in the text) following. Changes we made are marked green in the final manuscript.

We hope the revised version is now suitable for publication in Hemijska industrija and look forward to hearing from you in due course.

Sincerely,

Sandra Stamenković Stojanović

University of Nis, Faculty of Technology

16000 Leskovac, Serbia

**Response to Reviewer A**

**Reviewer’s comment:**

My main remark is that the review is not very focused on a specific topic. The authors explained that the reason that the genus Bacillus is often used in the biological control of plant diseases is the main feature of this group of microorganisms to form endospores and it is important to achieve good sporulation and to incorporate the spore into the formulation. So I think that the review should be focused to Bacillus spore formulation, and other examples such as enzyme production, etc., especially if not related to the formulations used in biopesticidal and phytostimulatory effect, should be excluded.

**Authors’ answer:**

We appreciate the reviewer’s comments and fully agree with it. Thank You for helping us making our paper much better! Sections, as well as tables, are updated and expanded with concrete information regarding the sporulation process (all of the changes are marked green). New text, related to the spore formation, is added throughout the manuscript and 20 new papers are cited. We have also reduced other examples (like different enzymes) that are not directly connected to the formulation, adding only a brief explanation of their significance (as they can help to degrade the cell walls of pathogenic bacteria) (lines 88-89). We hope that the review is now more focused on the specific topic and that it gives a much better picture of current findings in the field.

**Reviewer’s comment:**

Moreover, concerning certain paragraphs in the paper, especially 3.1.3. Cultivation conditions and 3.1.4. Scale-up of the system were written as a school textbook, too general, without enough concrete information on a given topic. Those are known facts, we should be able to read more about the Bacillus cultivation, depending on endospore formation. At some other places throughout the whole manuscript, in order to find out concrete information we have to read the original reference instead in this paper.

**Authors’ answer:**

Paragraphs 3.1.3 Cultivation conditions and 3.1.4. Scale up of the system are also expended with many new concrete examples that are answering the question how cultivation conditions can affect spore formation and which factors can affect the scale-up of *Bacillus sp.* cultivation system (lines 239-244, 245-247, 253-259, 272-279, 281-292, 310-319). Apart from that, 3.1.2. section Medium composition has also been extended with new examples on different medium components and their effect on bacterial sporulation (lines 168-174, 177-183, 186-189).

General and repetitive sentences are either modified (by adding additional information on the subject) according to the new citations or deleted from the text.

**Reviewer’s comment:**

Furthermore, we don’t know much about formulation procedure. For example, when the spore is formed, in which ways they can be further separated from the broths or solid media, and so on. What I am trying to explain is that methodological problems and research gaps should be also identified and pointed out, as well as the major achievements in the reviewed field.

**Authors’ answer:**

As stated in the text of the review, step of separation and purification of bacteria (apart from simple centrifugation) is very often skipped in the process of making bacterial formulation. Many authors prefer to keep the metabolites from the fermentation broth within the formulation, because of their beneficial properties to the bacteria and generally to the performance of formulation itself, which is why they use “raw” fermentation broth for further processing.

Yet again, we agree with the reviewer that it cannot be skipped from this review paper, which is why 3.2. Formulation procedure is expanded (lines 326-335) with information on separation and purification procedures.

We hope that all the other changes, new literature cited and new information added throughout the text, now make this review paper complete and specifically informative.

**Reviewer’s comment:**

Minor remarks:

PGPM is not a standard abbreviation to be used as a keyword.

Page 4, line 86 correct the Phosphsolabolization to phosphate solubilization.

Page 9, line 182 Plese remove word modern from the following sentence: In a large number of papers, optimization of growth medium composition is carried out using modern multifactorial analyzes.

**Authors’ answer:**

All of the reviewer's suggestions have been accepted and corrected in the document: PGPM is removed from keyword section, phoshosolabilization is changed to phosphate solubilization (line 84) and word modern is deleted (line 203).

**Response to Reviewer B**

**Reviewer’s comment:**

There is a relatively high number of cited literature in Serbian language which is not easily readable by the main community. In addition of that its recommended to update the literature because roughly 40% are in the range “2010 or older”.

**Authors’ answer:**

Authors thank the reviewer for this suggestion. We have raised the number of international papers written in English (20 new papers in English), which now makes 94% out of a total number of papers. Also, as proposed, we have added some more recently published papers (Goswami et. al., 2019; Hashem et. al., 2019; Xia Zhang et. al., 2018; Fira et. al., 2018; Khardziani et. al., 2017; Cerozi et. al., 2016; Elsayed et. al., 2014; Man et. al., 2014, Sarrafzadeh et. al., 2014) to update the literature as recommended.

**Reviewer’s comment:**

There are some very general statements which have more "text book character" (e.g. lines 215-217, 249-251, 336-338...). Please check also for repetitions (e.g. lines 274-275 and p. 16, line 240)

**Authors’ answer:**

Authors fully agree with the reviewer. We are very thankful for all the thoughtful comments that helped us improve our paper. All general and repetitive sentences are either modified (by adding additional information on the subject) according to the new citations or deleted from the text. Paragraphs 3.1.2 Medium composition 3.1.3 Cultivation conditions and 3.1.4. Scale up of the system are also expended with many new concrete examples on the subject, aiming to give much more specific review of the current research. All of the changes and newly added sentences are marked green in the text.

**Reviewer’s comment:**

Please omit reference from the Conclusion section.

**Authors’ answer:**

The suggestion is accepted. References are excluded from the Conclusion section. The conclusion section is updated as well.