

Reviewer report of the Manuscript ID PEERJ-REVIEWING-85145

Congratulations on the present study! The present review is a relevant topic nowadays.

General comments

The present study is well-written and no major English Editing is needed. However, I found some errors that I stated in the minor comments.

The *Abstract* section could show more concrete data obtained in studies involving probiotics and mainly postbiotics (there no information about the postbiotics).

The *Introduction* section must be reviewed in terms of English editing of certain sentences and terms. Please see my minor comments below.

The *Methodology* section is poorly described. If it is an integrative review, it must show the PRISMA guidelines and statement. Otherwise, the present work is merely a review article. This is major comment is mandatory to maintain the endorsement publication of an integrative review. Please see my minor comments below.

The *Results* section must be reviewed by the authors because it is also poorly described. The main information of Chart 1 should be extended, and the description of summarized information should be written. Please see my minor comments below.

I am really concern with the confusing description and discussion of the data, where the authors initially talked about probiotic and postbiotic studies and then prebiotic appeared and synbiotics, without clarifying what is synbiotics.

It seems that the present version of the manuscript is a draft, and it will clearly confuse the non-familiar Readers without a major revision. The present review is important and should be publish, but a serious revision and effort by the authors must be realize in the revised version.

In conclusion, the authors must realize a major revision of the present work for publication endorsement.

Minor comments

Abstract – I recommend the authors to add more concrete data obtained in studies involving probiotics and mainly postbiotics. There is no information about the postbiotics in the PRISMA analysis.

Lines 51-68- I do not understand the information added in these lines... Is it part of the Abstract section or it is a subsection of the journal?

Introduction

Lines 83-84- Please rectify "... (Centers for Disease Control and Prevention. (ANTIBIOTIC RESISTANCE THREATS IN THE UNITED STATES, 2019) ...".

Lines 92-93- "(PETROVA et al., 2015; WAGNER et al., 2012; PANIAGUA et al., 2021)" The authors must be written in the same format. All capital or just the first name letter. Please choose one format.

Lines 97-105- Please rectify the sentences... All words are in italics and the reference here is separated from the sentence with a final dot. The authors should maintain the same format along the text of the manuscript.

Line 106- Microorganisms' names should be all in italic form.

Lines 122-123- I invited the authors to further describe these antimicrobial molecules: "... antimicrobial compounds, and substances...".

Line 137- Please choose one format and maintain it: "...between probiotics and post-biotics...". Postbiotics or post-biotics – both terms are acceptable but use one.

Methodology

Line 155- Please add the PRISMA flow chart of the integrative review "integrative review" accordingly with PRIMA guidelines" and cite the proper reference. See model:

https://www.researchgate.net/figure/PRISMA-flow-chart-of-the-integrative-review-abstracts-screened-using-the-following_fig1_260167374

Line 158- Please clarify Lilacs database: <https://lilacs.bvsalud.org/es/> or <https://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?lang=e&IscScript=iah/iah.xis&base=LILACS&form=E?>

Line 168- Please rectify: "microbicidal activity of *Lactobacillus* in the presence of bacteria". Well-diffusion assays, MIC, biofilm assays? What type of assays did you search? All studies were original research article, right?

How many authors were the reviewer, and which made the eligibility decision? How was the information compiled?

The Methodology section is poorly described. If it is an integrative review, it must show the PRISMA guidelines and statement.

<https://pubmed.ncbi.nlm.nih.gov/15839365/#:~:text=The%205%2Dstage%20integrative%20review,interpretation%20and%20presentation%20of%20results.>

"The 5-stage integrative review process includes (1) problem formulation, (2) data collection or literature search, (3) evaluation of data, (4) data analysis, and (5) interpretation and presentation of results."

Otherwise, the present work is merely a review article. This is major comment is mandatory to maintain the endorsement publication of an integrative review.

Results

Flowchart 1 – "Justification: not consistent with the purpose of this work." It is not a well-done description. Please the example in:

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263522>

Chart 1 – Please add a column indicating if the studies are probiotic and/or postbiotics, another column if the studies are in vitro or/and in vivo assays, and other column with the applied methodology and the number of isolates used.

The Results section is also poorly described. The main information of Chart 1 should be extended, and the description of summarized information should be written. The Readers should not be obligated to the math of the number of probiotic and/or postbiotics, in vitro or/and in vivo assays, and the methodologies applied in the selected studies of Chart 1. Please revise the Results section description.

Discussion

Subtitles should not finish with a final dot.

Line 195 – “human skin” *S. aureus* is usually present in skin and mucosal microbiota, more exactly, upper respiratory tract. Please rectify it.

Lines 196-197- Careful with the statement. “... under specific circumstances, this bacterium can transition from commensalism to pathogenicity...”. There are *S. aureus* strains (susceptible strains) that can transition from commensalism to pathogenicity, but there are other strains (mainly MRSA) that are not present in the human microbiota and when present they will induce an infection, as primary pathogens as they are. Please rectify the sentence to avoid misunderstanding the non-familiar Readers. Also, the same situation is for *K. pneumoniae* in the next paragraph. Please clarify it too.

Line 203- Put *S. aureus* in italic form. Check the remaining text.

Line 218- “ANVISA data” is the abbreviation of “Agência Nacional de Vigilância Sanitária”? Please clarify to the Readers.

Lines 230-231- Delete empty lines.

Lines 232-244- The present integrative review included probiotic and postbiotics studies, right? Are there prebiotic studies too? It is confusing the inclusion of prebiotics in the *Discussion* section when previously the author only cited probiotic and postbiotic studies. Please clarify and revise the original manuscript.

Lines 254-255- “Unlike live probiotics, postbiotics are non-viable components derived from the fermentation process.” It is not necessary that postbiotics are derived from fermentation, it could be derived from aerobic metabolic process. Please rectify it for the non-familiar Readers. Postbiotics are non-viable components derived from the a microorganism (probiotic or not) metabolism that show antimicrobial activity and/or promote health benefits to the human host through its microbiota or immune/metabolism responses.

Line 267- Please rectify: “CHEN, Chi-Chung, and other researchers”.

Line 267-268- Please replace “antimicrobial capacity” with antimicrobial activity or ability.

Line 273-276- Please clarify “three variants of *Lactobacillus* spp.”. What specific strains of the indicated *Lactobacillus* species the authors studied?

Line 279- The same previous comment for *L. gasseri* strain.

Line 280- Add the full name *Staphylococcus haemolyticus* before abbreviation.

Lines 292-297 – Please state the antimicrobial assays used by the authors... by the results, I guess that it was the well-diffusion assay. The text is in a different format.

Lines 300-304- Here the authors state the type of strain used in the study. This type of information and the source of the lactobacilli must be added to the *Discussion* section, as well as Chart 1 of the *Results* section.

Lines 311-325- “the combination of sodium butyrate with the probiotics *Lactobacillus*” This combination is called synbiotics. Please see the example Table 4 of the following paper: <https://www.mdpi.com/2673-9879/3/3/34>; where the authors clearly distinguish prebiotics, probiotics, synbiotics, and postbiotics studies and in vitro and in vivo assays.

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It seems that the present version of the manuscript is a draft, and it will clearly confuse the non-familiar Readers without a major revision. The present review is important and should be publish, but a serious revision and effort by the authors must be realize in the revised version.

I look forward to reviewing the revised version of the manuscript.
Best regards