

Review Form 3

| | |
|--------------------------|---|
| Journal Name: | Journal of Advances in Biology & Biotechnology |
| Manuscript Number: | Ms_JABB_129016 |
| Title of the Manuscript: | A Review on the Potential of Insect Gut Microbes in Advancing Renewable Energy Production |
| Type of the Article | Review Article |

General guidelines for the Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

<https://r1.reviewerhub.org/general-editorial-policy/>

Important Policies Regarding Peer Review

Peer review Comments Approval Policy: <https://r1.reviewerhub.org/peer-review-comments-approval-policy/>

Benefits for Reviewers: <https://r1.reviewerhub.org/benefits-for-reviewers>

PART 1: Comments

| | Reviewer's comment | Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i> |
|---|---|---|
| Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part. | This manuscript is significant for the scientific community as it provides a comprehensive overview of the metabolic potential of insect gut microbes in bioenergy production. By detailing the enzymatic pathways and symbiotic relationships within insect gut microbiomes, it highlights novel biocatalysts and processes that could revolutionize sustainable energy production. Additionally, the manuscript addresses current challenges and proposes future research directions, offering a roadmap for harnessing these microbial systems to meet global energy demands and mitigate climate change. This work not only advances our understanding of microbial ecology but also opens new avenues for interdisciplinary research and industrial applications. | |
| Is the title of the article suitable? (If not please suggest an alternative title) | The title "A Review on the Potential of Insect Gut Microbes in Advancing Renewable Energy Production" is quite suitable as it clearly conveys the focus of the manuscript. It highlights both the review nature of the article and the specific topic of insect gut microbes in the context of renewable energy production. | |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | The abstract comprehensively covers a wide range of aspects related to insect gut microbes and their potential in renewable energy production, including enzymatic pathways, microbial consortia, and integration with advanced biotechnologies. In addition, it clearly outlines the main focus areas, such as the types of biofuels produced, key insect models, and the challenges faced in this field. Suggestions for Improvement: <ol style="list-style-type: none"> 1. Clarity and Flow: The abstract could benefit from improved clarity and flow. Consider breaking down long sentences into shorter, more digestible ones. 2. Specificity: While the abstract is comprehensive, adding specific examples or findings from recent studies could strengthen it. For instance, mentioning specific enzymes or microbial strains that have shown promise in recent research. 3. Challenges and Solutions: The abstract mentions challenges but could also briefly touch on potential solutions or ongoing efforts to address these challenges. This would provide a more balanced view. 4. Conclusion: Adding a concluding sentence that summarizes the potential impact of this research on the field of renewable energy would provide a strong ending. For example: "Overall, leveraging insect gut microbes for bioenergy production holds significant promise for advancing sustainable energy solutions." | |
| Is the manuscript scientifically, correct? Please write here. | Based on the provided content, the manuscript appears to be scientifically accurate and well-researched. It covers a wide range of topics related to insect gut microbiomes and their potential in bioenergy production, supported by relevant studies and references. The detailed analysis of enzymatic pathways, microbial interactions, and potential applications demonstrates a thorough understanding of the subject matter. Additionally, the manuscript addresses current challenges and future opportunities, providing a balanced and comprehensive overview. However, a full assessment of scientific correctness would require a thorough review of the entire manuscript, including all data, methodologies, and references. | |
| Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. | Based on the provided content, the references appear to be relevant and recent, covering studies and advancements up to 2023. The inclusion of both foundational and recent studies helps to provide a comprehensive overview of the topic. However, to ensure the manuscript is as current and comprehensive as possible, here are a few suggestions for additional references that could be included: <ol style="list-style-type: none"> 1. Recent Advances in Metagenomics: "Recent Advances in Metagenomics and Its Applications in Agriculture" by Sharma et al., 2023. This paper discusses the latest metagenomic techniques and their applications, which could provide additional context for the advances in omics technologies section. 2. Synthetic Biology and Biofuel Production: "Synthetic Biology Approaches for Biofuel Production" by Chukwuma et al., 2022. This review covers recent synthetic biology strategies for enhancing biofuel production, which could complement the discussion on synthetic biology applications. 3. Microbial Consortia and Bioenergy: "Engineering Microbial Consortia for Enhanced Bioenergy Production" by Li et al., 2023. This paper explores the design and optimization of microbial consortia for bioenergy applications, relevant to the sections on microbial interactions and community dynamics. | |

Review Form 3

| | | |
|---|--|--|
| <p>Is the language/English quality of the article suitable for scholarly communications?</p> | <p>Based on the provided content, the language and English quality of the article appear to be suitable for scholarly communications. The manuscript is well-structured, with clear and coherent sentences that effectively convey complex scientific concepts.</p> | |
| <p>Optional/General comments</p> | <p>Comments on the Introduction Although the introduction is well-structured, with distinct sections that logically flow from the global energy crisis to the role of microbes and the specific focus on insect gut microbes, the following suggestions would help in improving it further. Suggestions for Improvement: 1. Clarity and Conciseness: Some sentences are quite long and could be broken down for better readability. For example: • Original: "The increasing demand for energy driven by industrialization and population growth, coupled with the environmental challenges posed by fossil fuel consumption, has underscored the urgent need for sustainable energy solutions." • Revised: "The increasing demand for energy, driven by industrialization and population growth, coupled with the environmental challenges of fossil fuel consumption, underscores the urgent need for sustainable energy solutions." 2. Specific Examples: While the introduction mentions the potential of insect gut microbes, it could benefit from specific examples or findings from recent studies to strengthen the argument. For instance, mentioning particular enzymes or microbial strains that have shown promise in bioenergy production. 3. Highlighting Challenges and Solutions: The introduction mentions challenges but could also briefly touch on potential solutions or ongoing efforts to address these challenges. This would provide a more balanced view and set the stage for the detailed discussion in the review. 4. Engaging Opening: Consider starting with a more engaging opening sentence to capture the reader's attention. For example: "As the world grapples with the dual challenges of energy scarcity and climate change, the search for sustainable energy solutions has never been more critical." Comments on Section II: Insect Gut Microbial Communities: An Overview The section provides a comprehensive overview of the structure and diversity of insect gut microbiota, their functional roles, and how they differ from other microbial systems. This depth of information is valuable for readers to understand the significance of these microbial communities. Suggestions for Improvement: 1. Clarity and Conciseness: Some sentences are quite dense and could be simplified for better readability. For example: • Original: "Insects represent one of the most diverse groups of organisms on Earth, with millions of species adapted to a variety of ecological niches." • Revised: "Insects are one of the most diverse groups of organisms, with millions of species adapted to various ecological niches." 2. Highlighting Key Points: Consider using bullet points or numbered lists for key points to enhance readability and emphasize important information. For example, when listing the factors influencing microbial diversity, a bullet point format could be used. Comments on Section III: Metabolic Potential of Insect Gut Microbes in Bioenergy Production The section thoroughly covers the enzymatic degradation of biomass, bioconversion processes, and advances in metagenomics and synthetic biology. This provides a well-rounded view of the metabolic potential of insect gut microbes. Suggestions for Improvement: 1. Highlighting Key Points: Consider using bullet points or numbered lists for key points to enhance readability and emphasize important information. For example, when listing the roles of different enzymes, a bullet point format could be used. 2. Engaging Opening Sentences: Start each subsection with a more engaging opening sentence to capture the reader's attention. For example, "The enzymatic degradation of lignocellulose, a major component of plant biomass, is a critical step in the production of biofuels" could be revised to "Breaking down lignocellulose, a major component of plant biomass, is essential for producing biofuels." Comments on Section IV: Current Research and Applications This section provides a thorough overview of current research and applications, covering various insect gut microbes and their roles in bioenergy production. The detailed examples and case studies enhance the credibility and depth of the discussion. Suggestions for Improvement: 1. Clarity and Conciseness: Some sentences are quite dense and could be simplified for better readability. For example: • Original: "Termites are a model system for studying lignocellulose degradation due to the exceptional efficiency of their gut microbial communities." • Revised: "Termites are ideal for studying lignocellulose degradation because of their highly efficient gut microbial communities." 2. Highlighting Key Points: Consider using bullet points or numbered lists for key points to enhance readability and emphasize important information. For example, when listing the types of enzymes or metabolic pathways, a bullet point format could be used. Comments on Section V: Challenges and Limitations This section provides a detailed analysis of the challenges and limitations associated with using insect gut microbes for bioenergy production. It covers a wide range of issues, from technical difficulties in cultivation to ethical and environmental concerns. Suggestions for Improvement: 1. Clarity and Conciseness: Some sentences are quite dense and could be simplified for better readability. For example: • Original: "One of the major challenges in leveraging insect gut microbes for bioenergy production is the difficulty in isolating and cultivating these microbes under laboratory conditions." • Revised: "A major challenge in using insect gut microbes for bioenergy production is isolating and cultivating them in the lab." 2. Integration of References: Ensure that references are seamlessly integrated into the text. For example, instead of "with metagenomic studies revealing that over 70% of microbial taxa in insect guts lack cultured representatives (Pernice et al., 2014)," it could be "with metagenomic studies revealing that over 70% of microbial taxa in insect guts lack cultured representatives (Pernice et al., 2014)." 3. Highlighting Key Points: Consider using bullet points or numbered lists for key points to enhance readability and emphasize important information. For example, when listing the factors that make it difficult to replicate the insect gut environment in vitro, a bullet point format could be used. Comments on Section VI: Future Perspectives and Opportunities This section effectively highlights the future potential and innovative opportunities in the field of insect gut microbiome research for bioenergy production. It covers a broad range of emerging technologies and interdisciplinary approaches. Suggestions for Improvement:</p> | |

Review Form 3

| | | |
|--|--|--|
| | <p>1. Clarity and Conciseness: Some sentences are quite dense and could be simplified for better readability. For example:</p> <ul style="list-style-type: none"> • Original: "Omics technologies, such as genomics, transcriptomics, and proteomics, are revolutionizing the study of insect gut microbes by providing deeper insights into their structure, function, and metabolic potential." • Revised: "Omics technologies like genomics, transcriptomics, and proteomics are transforming the study of insect gut microbes by revealing their structure, function, and metabolic potential." <p>2. Integration of References: Ensure that references are seamlessly integrated into the text. For example, instead of "leading to the identification of genes encoding lignocellulolytic enzymes, fermentation pathways, and other bioenergy-relevant functions (Sun et.al., 2018)," it could be "leading to the identification of genes encoding lignocellulolytic enzymes, fermentation pathways, and other bioenergy-relevant functions (Sun et al., 2018)."</p> <p>3. Highlighting Key Points: Consider using bullet points or numbered lists for key points as an infographic to enhance readability and emphasize important information. For example, when listing the benefits of omics technologies, a bullet point format could be used.</p> <p>Suggestions for Improvement of Conclusion:</p> <p>1. Clarity and Conciseness: Some sentences could be simplified for better readability. For example:</p> <ul style="list-style-type: none"> • Original: "Insect gut microbes hold immense potential for advancing bioenergy production due to their ability to efficiently degrade lignocellulose, produce biofuels, and function under challenging environmental conditions." • Revised: "Insect gut microbes have great potential for bioenergy production because they can efficiently degrade lignocellulose, produce biofuels, and function in challenging conditions." <p>2. Balancing Optimism with Realism: While it's important to highlight the potential of insect gut microbes, balancing this with a realistic assessment of the challenges can provide a more nuanced conclusion. For example, acknowledging the current limitations and the ongoing efforts to address them can add depth to the conclusion.</p> <p>3. Engaging Closing Sentence: Ending with a strong, engaging sentence can leave a lasting impression on the reader. For example, "By integrating these microbial systems with other renewable energy technologies and creating supportive policies, insect gut microbes can play a transformative role in meeting global energy demands sustainably and mitigating the effects of climate change" could be revised to "With continued research and supportive policies, insect gut microbes could revolutionize sustainable energy production and help combat climate change."</p> <p>Based on the provided content, the manuscript appears to address ethical issues related to the use of insect gut microbes for bioenergy production. It discusses concerns such as the risks of bioprospecting insect populations in the wild and the potential impacts of engineered microbes on ecosystems. These considerations are important for ensuring that the research and its applications are conducted responsibly and sustainably.</p> <p>Based on the provided content, there are no obvious indications of competing interest issues in the manuscript.</p> <p>There is no significant plagiarism in the provided content of the manuscript</p> <p>Based on the provided content, the manuscript appears to be well-researched, scientifically accurate, and relevant to the field of bioenergy production. It addresses important topics, provides detailed analyses, and includes recent references. The language quality is suitable for scholarly communication, and the manuscript effectively discusses both the potential and challenges of using insect gut microbes for bioenergy. However, there are areas where minor revisions could enhance clarity, readability, and integration of references.</p> | |
|--|--|--|

PART 2:

| | Reviewer's comment | Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here) |
|--|--|---|
| Are there ethical issues in this manuscript? | <i>(If yes, Kindly please write down the ethical issues here in details)</i> | |

Reviewer Details:

| | |
|----------------------------------|--|
| Name: | Aremanda Ramesh Babu |
| Department, University & Country | Mainefi College of Engineering & Technology (MCET), India |