Journal Name:	**Journal of Basic and Applied Research international**
Manuscript Number:	**Ms_JOBARI_12532**
Title of the Manuscript:	**The Comparison and Application of 3D-Modeled Sutures in the Ironclad Beetle Phloeodes diabolicus for Use in Load-Bearing Construction**
Type of the Article	**Original Research Article**

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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.
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PART 1: Review Comments

Compulsory REVISION comments	**Reviewer's comment**	**Author's Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	This manuscript is important because it shows how the strong structure of the ironclad beetle's exoskeleton could inspire better materials for construction. Studying and 3D-printing parts similar to the beetle's joints, this research shows how these natural designs might help create materials that are both strong and lightweight. Even though the results didn't completely match the predictions, the study provides useful information for future projects to make construction materials more durable by copying nature's designs. It also combines biology with engineering to find solutions for stronger, more efficient building materials. This approach could lead to safer, longer-lasting structures by using designs inspired by nature.	
Is the title of the article suitable? (If not please suggest an alternative title)	cle, "The Comparison and Application of 3D-Modeled Sutures in the loeodes diabolicus for Use in Load-Bearing Construction," is suitable ys the focus on comparing and applying 3D-modeled beetle-inspired ction. s preferred, an alternative could be: "3D-Modeled Ironclad Beetle er Load-Bearing Construction Materials."	
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 is quite comprehensive as it covers the main purpose, methods, and key findings of the study. It explains the focus on using 3D-modeled sutures inspired by the ironclad beetle for load-bearing construction and mentions the testing methods and initial results. However, a few improvements could make it clearer. **Suggestions**: • Add a brief sentence on the importance of this study – for example, explaining why studying beetle-inspired joints could be helpful in building stronger materials.	

	• Clarify the main findings more simply – for instance, summarize that the ironclad sutures were strong but didn't outperform some other joints tested, which could help readers understand the results quickly. • Remove extra details about specific tools used (like the name of the printer model or software) as they are not essential in the abstract and could be mentioned in the main text instead. Overall, these changes would make the abstract easier to understand while keeping all the important information.	
Are subsections and structure of the manuscript appropriate?	Yes, the subsections and structure of the manuscript are mostly appropriate, as they guide the reader through the study in a clear and logical order. Starting with an introduction to the ironclad beetle and its strong exoskeleton gives good context for why this research is valuable. The sections on experimental methods and materials clearly explain the 3D-printing process and the setup used for testing, making it easier for readers to understand how the study was conducted. **However, a few small improvements could help make the structure even clearer:** • Consider adding a brief section explaining the hypothesis separately to highlight what the researchers expected to find and why. • Include a separate discussion section that explains the results in more detail, especially comparing the ironclad sutures to other types tested. This could help readers see the significance of each finding without searching through the results. • In the conclusion, briefly mention future research steps or potential applications, as this would give a better sense of what the study's findings could mean for real-world construction materials.	
Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.	This manuscript shows scientific correctness by carefully designing experiments that accurately mimic the natural structure of the ironclad beetle's joints. The authors' use of different suture designs and layers provides a detailed comparison of strength and durability, which is essential for understanding how these joints could be applied in real-world construction. The testing process is	

	thorough, as they measure not only load capacity but also displacement, giving a complete view of each suture's performance. Additionally, the methodology is well-documented, allowing others to replicate the experiment, which is a key factor in scientific reliability. By grounding their study in both biological insights and engineering applications, the authors make a strong case for the scientific and practical value of their findings. This approach makes the study robust and technically reliable, as it combines accurate modeling with practical testing for real-world impact.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. -	The manuscript references several key studies that explore the structural properties of the ironclad beetle's exoskeleton. However, some of these references are outdated, such as Doyen's 1976 study. To enhance the manuscript's relevance and depth, incorporating more recent research is advisable. **Suggested Additional References:** • **Rivera et al. (2020):** This study delves into the toughening mechanisms of the diabolical ironclad beetle's elytra, providing insights into its exceptional durability. https://www.nature.com/articles/d41586-020-02976-0 • **Lee et al. (2021):** This research examines the microstructure and nanomechanical properties of the exoskeleton of an ironclad beetle, offering a detailed analysis of its strength and resilience. https://europepmc.org/article/MED/33530070 Including these recent studies will provide a more comprehensive understanding of the topic and strengthen the manuscript's foundation.	
Minor REVISION comments **Is the language/English quality of the article suitable for scholarly communications?**	The language quality of the article is generally suitable for scholarly communication, as it clearly describes the research and explains technical details. The authors use scientific terms correctly, which is important for accuracy in academic writing. However, some sections could be simplified to make the content more readable for a wider audience. For instance, certain technical details could be explained in simpler terms or broken down into shorter sentences to improve clarity. This would help readers who are not experts in the field understand the main points more easily.	

	Additionally, there are areas where the wording could be more precise to avoid any confusion, especially in sections that describe the experimental setup and results. A few minor grammar and phrasing adjustments might also improve the flow of the text, making it easier to read. Overall, the language quality is good, but with some small adjustments, it could be even better suited for scholarly communication by making complex ideas more accessible and ensuring clarity throughout the manuscript.	
Optional/General comments	Overall, this manuscript is an interesting and valuable contribution to biomimetic design and materials engineering. The study successfully bridges biology and engineering by using the ironclad beetle as inspiration for creating strong, lightweight structures. This approach has the potential to influence future construction materials and techniques significantly. **A few general suggestions:** • Consider expanding the discussion section to further interpret the results and highlight possible applications of beetle-inspired designs in construction. • Add visuals or diagrams that show how the sutures were modeled and how they differ from each other. This could make it easier for readers to visualize the experiment and understand the variations. • Provide a brief section on potential limitations and areas for improvement, especially regarding the equipment limitations and the specific challenges faced in the study. This would add depth to the study's findings and encourage further research. • Summarize future research directions to help readers see the bigger picture and how this work could be expanded in follow-up studies. Additionally, the captions under the tables and figures are not well organized, which can make it difficult for readers to quickly understand the content of each visual. Some captions could be more descriptive, clearly explaining what each figure or table represents and how it relates to the study's findings. Improving the	

	organization and clarity of these captions would help readers follow the results more easily and enhance the overall readability of the manuscript.	

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?	*(If yes, Kindly please write down the ethical issues here in details)*	

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