ISSN(O): 2320-5407 | ISSN(P): 3107-4928

ISSN NO. 2320-5407

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

www.journalijar.com

REVIEWER'S REPORT

Manuscript No.: IJAR-58186

Title: Impact of Tamarind Pulp Powder Enrichment on the Functional Properties and Physical/Chemical Composition of Corn and Soybean Composite Flours: Towards Agri-Food Valorization

Recommendation:

Accept as it is .....

Accept after minor revision.....

Accept after major revision .....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	....			
Techn. Quality		...		
Clarity	...			
Significance	...			

Reviewer's ID: JPR- 160

Detailed Reviewer's Report

The manuscript, "***Impact of Tamarind Pulp Powder Enrichment on the Functional Properties and Physical/Chemical Composition of Corn and Soybean Composite Flours: Towards Agri-Food Valorization***," addresses an important topic in food science by investigating the nutritional and functional enhancement of composite flours through tamarind pulp incorporation. The study is timely and relevant, particularly in the context of developing nutrient-dense, plant-based functional foods using locally available agricultural resources. The research objective is clearly stated, and the abstract effectively summarizes the methodology, major findings, and practical significance of the work. The introduction provides a sound scientific background by discussing the nutritional importance of maize, soybean, and tamarind, while highlighting the limited research on their combined utilization. The rationale for developing enriched composite flours is well presented, and the hypothesis regarding the influence of increasing tamarind incorporation is logical. Nevertheless, the introduction could be strengthened by citing more recent studies on composite flour technologies and by providing a clearer explanation of the anticipated industrial applications of the formulated products.

The methodology is comprehensive and adequately described. The preparation of the composite flours, formulation ratios, physicochemical analyses, functional property measurements, and statistical analyses are appropriate for achieving the research objectives. The use of ANOVA, Tukey's HSD test, Principal Component Analysis (PCA), permutation testing, Euclidean distance analysis, and hierarchical clustering demonstrates a rigorous analytical approach that increases confidence in the reported findings. The results are systematically presented and supported with appropriate statistical evidence. The study demonstrates that increasing tamarind pulp concentration significantly improves dietary fiber, protein content, water absorption capacity, and emulsifying activity while reducing pH and lipid content. The discussion successfully relates these findings to previously published studies and explains the biochemical mechanisms responsible for the observed changes. The identification of the 15% tamarind formulation (FC3) as the optimal balance between nutritional quality and technological functionality represents a valuable contribution with potential applications in the functional food industry.

The multivariate statistical analysis is one of the strengths of the manuscript. The PCA, validated through permutation testing, effectively differentiates the formulations and demonstrates the robustness of the experimental data. The inclusion of hierarchical cluster analysis and Euclidean distance measurements further strengthens the interpretation of similarities and differences among the formulations. These advanced statistical techniques enhance the scientific quality of the study and provide strong support for the conclusions drawn by the authors. The manuscript is generally well organized and scientifically sound. However, several language and formatting issues should be corrected before publication. There are occasional grammatical errors, inconsistencies in terminology,

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spacing, table numbering, and figure referencing. Some sections of the discussion are repetitive and could be made more concise, while a more explicit discussion of the practical limitations of the study and future research directions would improve the manuscript. Additionally, the conclusion would benefit from mentioning possible commercialization challenges and the need for sensory evaluation and shelf-life studies before industrial application.

Overall, this is a well-designed experimental study that provides meaningful scientific evidence regarding the nutritional and functional improvement of corn–soy composite flours through tamarind pulp enrichment. The experimental design is appropriate, the statistical analyses are robust, and the findings are relevant to food product development and agri-food valorization. Subject to minor revisions addressing language, formatting, and a more comprehensive discussion of practical applications and limitations, the manuscript is suitable for publication.