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| Journal Name: | [Current Journal of Applied Science and Technology](https://journalcjast.com/index.php/CJAST" \t "_blank). |
| Manuscript Number: | **Ms\_** CJAST**\_138241** |
| Title of the Manuscript: | **Fermenting cocoa using a starter strain of Candida tropicalis: A strategy to improve the quality of cocoa beans in Côte d’Ivoire** |
| Type of the Article | **Original Research Article** |

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| PART 1: Comments | | |
|  | Reviewer’s comment **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | **Author’s Feedback** (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. A minimum of 3-4 sentences may be required for this part.** | The manuscript "Fermenting cocoa using a starter strain of Candida tropicalis: A strategy to improve the quality of cocoa beans in Côte d’Ivoire" refers to using Candida tropicalis to ferment cocoa beans. Fermentation of cocoa beans is mandatory and skilled process to enhance the flavour, colour, texture and taste of the cocoa beans and its byproducts. | This paper is important to the scientific community because cocoa beans is of importance to the world since almost everyone eats, drinks or uses a product derived from cocoa beans. Inconsistent bean quality is a problem and it is an imperative to find ways to improve it in order to helps farmers increase their revenue and reduce economic loss. This manuscript is an approach to solving the problem by using C. tropicalis, a local starter isolated from fermenting cocoa beans. C. tropicalis could be used as a solution to not only speed up the fermentation process but also improve bean quality. |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **The title is not apt.**  **I would suggest " Effect of inoculum size in fermentation of cocoa beans using Candida tropicalis"** | Okay I will take this title instead |
| 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 comprehensive of the work reported by the authors.** | Thank you |
| Is the manuscript scientifically, correct? Please write here. | Yes the manuscript is scientifically correct | Thank you |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.** | The references are correct. However is suggest quoting to recent studies not later that 8- 10years. | I have added new references |
| Is the language/English quality of the article suitable for scholarly communications? | The language has to be improved | I have improved the language |
| Optional/General comments | **Considering only pH and concentration of total reducing sugars is very preliminary. Further inclusions such as isolation of the starter culture from various sources, its comparison with fermenting abilities of similar or other strains. Including more parameters which influence the fermentation such as temperature, agitation, etc.. might add value to the work.**   * **Please check the manuscript for grammatical and spelling mistakes.** * **Under materials and methods: Methods (2.1) Please clarify if the culture *Candida tropicalis* was isolated by the authors or procured from any other source.** * **Please justify or rephrase the statement, "The freeze-dried strain was proposed by researchers from Biotechnology Research Unit at Felix Houphouët Boigny University ".** * **What was the criteria for selection of the cocoa pods involved in the study ?** * **2.2.1 :** **Frozen cultures have to be first revived, checked for viability and purity before being used for fermentation. The authors did not mention anything in this regard.** * **Please discuss the numericals mentioned in the formula.** * **2.2.2 What is the significance of using banana leaf ?** * **The authors mentioned starter powder referring to 2.2.1 but there is nothing as such mentioned under that section.** * **The authors mentioned spontaneous fermentation in cocoa pods, how was this avoided in the test pods? How did the authors make sure there was no spontaneous fermentation in the pods under study as there is no mention of any sterilisation methods involved.** * **2.2.2.1 What is the significance of adding methanol and HCl ?** * **Please elaborate on what is fermentation index ? and how is int relevant to the present study ?** * **2.2.2.2 How is titration studies justified for a dark coloured solution ? Adding 20g of cocoa powder results in a brown colour solution, how can the characteristic pink colour be observed ? Please justify the method used for this analysis.** * **2.2.2.4 What was the time of heating for extracting soluble sugars from the cocoa pulp?** * **2.2.2.6 explain in detail the significance of cut method. Can the cocoa beans be used for fermentation again after being cut? How is progress of fermentation monitored and inferred?** * **3.1.3 Not adding inoculum to the control does not mean the control is void of any other contaminant which can cause fermentation.** * **3.1.4 Please justify why is the concentration of reducing sugars and total sugars is decreasing in the bean pulp, where as it is increasing with time in bean cotyledon as mentioned in 3.1.5.** * **3.1.6 Browing is also possible by simply exposing to sun. Please justify how do you claim fermentation as the only cause for browning.** * **What is the type of reducing sugars present in the cocoa pulp and cotyledon ? Can *Candida tropicalis*  ferment those sugars *?* If yes, why is there a increase in the amount of total sugars in the cotyledons?**   **Studying only the pH and determining the concentration of reducing sugars are very preliminary methods and minimal for a scientific study.** | * This is study that was based on previous work. I have not done the isolation part I have just been given the strain to work with. Preliminary study has already been done on that. * I have checked the manuscript for mistakes * I have clarified it * I have rephrased the sentence * Matured, ripped and healthy pods were selected to conduct fermentation * I have added a phrase to mention it   N= n x 5 x 105 x fd (this is the formula of those cells used to count viable cells in the culture. To do that you have to count the number of bacteria in a specific square viewed under the microscope, you repeat that at least 5 times then you do the average and multiply by the dilution factor to calculate the charge)   * Banana leave is used to cover the beans during fermentation, It is a type of fermentation process known as heap fermentation. * Before the pods are opened, they are considered sterile, the spontaneous fermentation was conducted as it is done by farmers without the addition of any inoculum. * Methanol and HCl are the solvent used for the fermentation index test. Anthocyanins are degraded and release pigments which is measured by reading the wavelength on the spectrophotometer and calculating the ratio of degraded anthocyanins and undegraded. * Fermentation index is a test to help determine the level of fermentation. Usually for a fermentation to be considered fermented they need to reach a fermentation index of 1. * It is the same method with phenophtalein. The solution is filtered first before titration so the final solution obtained is pink. * They were conducted each day during sample collection. * The cut method is used to determine the degree of fermentation by looking at colours of beans. Yes the beans can still be used after the cut test. According to various norms, a well fermentated beans need to have a certain percentage of brown beans in order to be considered good quality or bad quality or a certain grade. * We cannot avoid other contaminant as it is conducted in the farm * Reducing sugars is decreasing in the pulp because the sugar in the pulp is being reduced and penetrates the cotyledons of the beans. This is why it is increasing in the cotyledons. The same thing applies to total sugars. * As the beans ferment the enzyme polyphenol oxidase gets activated and breaks down cell wall leading to oxidation of polyphenols which the produce the compounds responsible for the brown colour. Drying without fermentation will not lead to brown skin it is only responsible for the outside drying of the beans. * They are mainly glucose and fructose. Yes Candida tropicalis can ferment them. Because the sugars are being reduced in the pulp and penetrates in the cotyledon increasing the amount of totals sugars in the cotyledon. |

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| **PART 2:** | | |
|  | Reviewer’s comment | **Author’s Feedback** (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 detail)* |  |