Review of: "Valorization of palm oil wastes into oyster mushrooms (Pleurotus HK-37) and biogas production"

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Potential competing interests: No potential competing interests to declare.

i. **Abstract**
ii. As much as possible abbreviations in the abstract should be avoided as it should stand alone to the reader
iii. No limit of decimal places of the p-value?

2. Introduction

(i) This section is well written, however in the justification of the study, since combined mushroom and biogas production has been done in other studies in the past in TZ using different species of mushroom, this study instead of repeating the same thing with a different species of mushroom i.e., oyster mushroom, it should have adapted those studies and move the research a step further towards technology optimization and application. Furthermore, if this is a feasibility study of utilizing palm oil processing waste one would expect the study to provide update data on the level of production, processing of palm oil and amount of waste generated and establish through the study the amount of mushroom and biogas that can be generated so that investors could see the worth of investment.

3. Methodology

i. What is palm squeeze test
ii. How was the proportion of the palm waste fractions arrived at? From the knowledge of mushroom cultivation nutrient requirement and composition analysis of the palm oil fractions a mathematical formular should have been used to decide on proportions of fractions in the mixed fractions
iii. It would be better if the formulae were referred by numbers as equation 1,2… in the text
iv. It is strange that only TS and VS was done as substrate characterization. It would have been more useful if characterization was given including carbohydrates, proteins, lipids, fibres, minerals and vitamins. This would have helped to indicate mass balance which important in process monitoring and determining the efficiency of the system e.g. what %ge of the removed carbon was converted to methane, dissolved into inorganic carbon or was retained in the sludge.
v. The method for quantifying CH_4 apart from referring to the published method should briefly be described in methodology.

4. Results

i. It is not clear why the title for Table 2 is put after and not before the Table.
ii. For easy comparison table 4 and 5 could be combined

5. Discussion

i. On page 15, Mushroom production seems to be almost 20% of the waste converted to mushroom. One would be interested to know if there are factories processing palm oil n Tanzania and their operational capacity to be able to calculate the amount of waste generated per day in deciding investment on large scale mushroom production exploiting the economics of scale
ii. It is not clear, at least to me, what the authors mean by mushroom yield increased progressively from formulation No.1 to No. 3. this sentence needs to be rephrased to include the yield values for formulation 1, 2 & 3. The reasons given for lower yield in fractions based on PMF and EFB does articulate properly with fig 1.
iii. On the Sentence “The increase in methane yield may be due to improved susceptibility of the substrates to microbial hydrolysis caused by the degradation of lignin by the oyster mushrooms” it would have been better if a reference was given regarding degradation of lignin by oyster mushroom.
iv. The methane yield for substrate formulation no. 3 (1:1 PMF and EFB) supplemented with POME and SD at 1%), resulted into a negative methane yield kg VS of -5.36%. A better argument is needed because methane yield than saying that nutrients were depleted during mushroom cultivation because methane yield is based on the amount of organic matter (In terms of KgVS) added) added.