Reviewer's report

**Title:** Do plants mediate their anti-diabetic effects through anti-oxidant and anti-apoptotic actions? An in vitro assay of 3 Indian Medicinal Plants

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**Reviewer:** Uraiwan Panich

**Reviewer's report:**

The authors have evaluated the anti-diabetic effects of P. emblica, C. longa and T. cordifolia on RINm5F cells treated with STZ through their antioxidant and antiapoptotic actions. Nevertheless, the authors did not discuss the possible active ingredients in the test extracts responsible for the effects.

1. In “Methods”, the authors should explain how 3 medicinal plants were standardized or have data concerning fingerprint analysis of the herbal extracts (e.g., content and presence of putative active substances) in order to ensure a consistent quality of the plant extracts studied.

2. In “Results”
   - Fig. 1: Author should put A or B to specify the graph when both are in the same figure. The authors mentioned that “As seen in Fig 1, P. emblica showed a dose-dependent increase MDA levels as compared to the control RIN cells (or cells without STZ) and C. longa showed a dose-dependent decrease in MDA as compared to control cells” Why were symbols indicating significant difference not shown in the graphs? Actually, as shown in the graphs, it seemed that P. emblica did not cause a significant change in MDA level in the control cells (non STZ-treated cells).
   - The authors should also discuss results concerning treatment of Gb with the cells why Gb caused an increase in MDA release.
   - Table caption: Should “$p<0.05; $$p<0.01; as compared to STZ untreated cells” be “$p<0.05; $$p<0.01; as compared to STZ treated cells”?
   - For apoptotic study, whereas P. emblica protected the RIN cells against STZ-induced damage, why did treatment of the cells with P. emblica alone increased number of apoptotic cells?
   - Protective effect of P. emblica on STZ-induced cell damage was not dose-dependent.
   - Authors should re-check statistical significance of difference for %cells in Pre G1 between cells + Pe (25 and 50 µg/ml) and control cells.
   - Authors mentioned that T. cordifolia demonstrated a dose-dependent decrease in the sub G0 population with maximum effect at 100 µg/ml, although there was no symbol indicating significant difference. The author should re-check statistical significance of difference for %cells in Pre G1 between cells + Tc (50 and 100 µg/ml) and control cells.
- For insulin secretion study shown in Fig. 3, while there was no statistical difference between groups, the author can’t really confirm nor conclude the effects of 3 plants studied on insulin secretion in the cells with and without STZ. While the author mentioned that Pe (10 µg/ml) showed an increase in insulin secretion on STZ-treated cells, there was no symbol showing statistical difference between Pe (10 µg/ml)-treated group and STZ-treated group. The authors should check the data since the bar height between 2 groups (Pe (10 µg/ml)-treated group and STZ-treated group) doesn’t look different. Also, the authors mentioned C. longa demonstrated a decrease in insulin secretion and that can’t be concluded while the difference between groups was not statistically significant.

3. From the results of this study, it can’t be concluded that prolonged administration of these medicinal plants may lead to increased insulin secretion and improved glycemic control.

4. In “Discussion”, the authors should discuss the possible active ingredients in the test extracts responsible for the pharmacological effects observed in this study.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I have not competing interest in this subject.