Review of: "Phytochemical Analysis and Antioxidant Activity of Extracts from Berchemia zeyheri — A Swazi Medicinal Plant"

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Potential competing interests: No potential competing interests to declare.

The proposed work deals with the characterization of the antioxidant capacity of a medicinal plant, namely*Berchemia zeyheri*.

Two different anatomic parts were evaluated, namely the leaves and the stem bark.

Several different extracts, at increasing polarity, were evaluated, starting from*n*-hexane to methanol.

The chemical characterization was made only from a qualitative aspect, with a consequent lack of clarification of the composition in comparison to previous studies.

The antioxidant activity was performed by one method, the scavenging of DPPH, very common in measuring the bioactivities of plant extracts. To better assess the biological activity of a plant extract, it should be tested with more than one method. Moreover, no clarity exists in the extracts' preparation for final dissolutions before the antioxidant assay, as well as in the DPPH solution for the reaction. It is well known that the reaction of DPPH has to be conducted in organic solvents, since DPPH is very sparingly soluble in water. Why did the authors perform their reactions in a buffered water solution? This assigns a very negative score to the proposed work, also having a negative influence on the reported results, which are surely not robust if performed in the unusually proposed method.

Abstract

This section needs some correction, as follows:

- Please correct “Qualitative of phytochemical analysis” to “Qualitative analysis of phytochemicals”;
- The sentence “Various solvent extracts were obtained by means of maceration and hot solvent extraction techniques” is not clear. Does it mean that all extracting solvents were used both hot and as macerating agents, or that some solvents were used hot and others were used in maceration? Please better explain;
- As for the reporting of the data regarding the DPPH assay, it has to include the concentration of the DPPH used in the assay. This is very important, since the potency of an antioxidant is always assessed by its active concentration compared to the concentration of the adopted oxidant probe. Moreover, the indication “87.84±0.01” lacks the measurement unit. Is it in % scavenging? Please specify and correct;

- Why was the IC50 of ascorbic acid measured as < 200 microg/mL? It should have a well-defined value. If the measurement resulted so difficult owing to the possible high concentration of ascorbic acid, the solution of ascorbic acid can be diluted to obtain a more easily measurable index of activity by EC50;
- The Authors, in the final sentence of the Abstract, affirm that "…showed a weak to moderate radical scavenging activity." This affirmation has to be better explained. Were the measured indexes of activities measured in comparison with ascorbic acid? Did the respective EC50 values get compared? How were the index of activities considered weak or moderate? Please better explain the context of this statement.

Introduction

This section needs some corrections, as follows:

- Maroyi, 2029. Please correct the year of this publication.

Materials and Methods

In this section, some clarifications are needed:

- In paragraph 2.1, describing the sampling of the plant materials, some detail is needed to clarify the age of the plant sampled, the leaves' exposition, the time of harvest, and so on.

- As regards paragraph 2.3, the question is if the macerations and extractions have been replicated and how many times. Moreover, it should be clearly stated if the macerations and extractions were made as subsequent, meaning that, just as an example, the hexane extract left a solid residue, it was treated with chloroform, the resulting pellet was treated with ethyl acetate, and so on. This is because it should be clarified if the subsequent weight of the plant materials belongs to the initially weighed material.

Resuming, the proposed work has a big flaw in the applied methodology of antioxidant capacity, so the final comment is that it is not suitable for publication. I propose for its rejection.