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LETTER

Evaluation of the in vivo Laxative Effects of Aqueous Leaf and Stem Extracts of *Artemisia abyssinica* in Mice [LETTER]

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Dear editor

We have closely read the recent article titled "Evaluation of the in vivo Laxative Effects of Aqueous Leaf and Stem Extracts of Artemisia abyssinica in Mice" by Ayele et al.[1] Interestingly, according to our searches, there is limited research available on the Aqueous Leaf and Stem Extracts of *Artemisia abyssinica (A. abyssinica)*. Most previous studies have focused on the antibacterial and antioxidant effect of *A. abyssinica* using crude extracts and essential oils. Hence, this study is likely the first evaluation of the laxative effects of Aqueous Leaf and Stem Extracts of *A. abyssinica*. This study used a method to prepare aqueous leaves and stems of *A. abyssinica* extracts by heating a plant in 0.8L of distilled water in a 1:1 ratio. Sorita et al (2023) highlighted the benefits of using aqueous extracts, such as minimizing the reliance on organic solvents, reducing expenses, and lowering energy consumption.[2]

Based on the results of this article, aqueous leaf and stem extracts of *A. abyssinica* have demonstrated laxative activity, specifically loperamide-induced constipation. The standard drugs (Castor oil) and bisacodyl used in this study also increased the wet fecal content and frequency of defecation. Ikarashi et al showed that the laxative effect of bisacodyl is achieved by activating intestinal macrophages to release Prostaglandin E2 (PGE2) and regulate the expression of Aquaporin 3 (AQP3) in intestinal epithelial cells through the released PGE2.[3] Additionally, research by Mekonnen et al indicated that castor oil induces diarrhea by releasing nitric oxide, thus increasing gastrointestinal membrane permeability to calcium, stimulating prostaglandin synthesis, and consequently increasing fluid and electrolyte influx into the intestinal lumen, as well as enhancing peristalsis.[4] However, this study does not explain how the aqueous leaf and stem extracts of *A. abyssinica* cause a laxative effect in mice. Thus, we recommend that researchers conduct testing of aqueous leaf and stem Extracts of *A. abyssinica* on in vitro studies using macrophage cell lines to observe the expression of PGE2, conduct biochemical analysis to provide insights into the molecular mechanisms underlying the laxative effects of the extract and perform histological examination to identify any structural alterations or inflammatory responses induced by the extract.

Furthermore, we recommend that researchers identify the chemical constituents of the extract using Liquid Chromatography-Mass Spectrometry (LC-MS) and determine the laxative compound of aqueous leaf and stem extracts of *A. abyssinica* using High-Performance Liquid Chromatography (HPLC) methods.[5] Subsequent research could also be carried out using molecular docking studies to identify compounds in the extract analogous to bisacodyl and castor oil. The results obtained with LC-MS can confirm the interaction of ligands with amino acid sequences that become target receptors (laxative bioactivity). At this stage, the prediction of pharmacodynamic potential/bioactivity of compound content in the sample to the receptor can be confirmed.

In conclusion, this study still conveys new ideas for exploring the laxative activity of aqueous leaf and stem extracts of *A. abyssinica*, which are hoped to be further explored and investigated to address the suggestions outlined above.

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Disclosure

The authors report no conflicts of interest in this communication.

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