Extraction and Characterization of *Zanthoxylum chalybeum* Crude Extract for Phytochemicals and Elemental Analysis

Georgina Masakhwe, Evans Suter & Aloys Osano
Department of Mathematics and Physical Sciences, Maasai Mara University
georginamasakhwe@gmail.com

Abstract

This study aimed at analyzing the bark and seeds extracts of *Zanthoxylum chalybeum* (popular for numerous medicinal properties) for heavy metals (Fe, Zn and Cu), secondary metabolites and for FTIR analysis. *Zanthoxylum chalybeum* bark and seeds extracts were collected, air dried then crushed into powder. The samples for phytochemical analysis were extracted using deionized water and diethyl ether and it was found that the bark contained alkaloids, saponins, tannins phlobatannins, phenols, terpenoids, cardiac glycosides, reducing sugars and anthraquinones in both deionized water and diethyl ether extracts. In the seed, alkaloids, saponins, tannins, phlobatannins, phenols, cardiac glycosides, reducing sugars and anthraquinones were present. The samples for heavy metal analysis were oven-dried, and digested using the wet method and heavy metals were analyzed using Atomic Absorption Spectrophotometry Technique. Iron in the bark extract was found to be 3.820±0.0001ppm and 0.578±0.0001ppm in the seed extract. Zinc was 0.643±0.0001ppm in the bark and 1.431±0.0001ppm in the seed extract and finally, copper was found to contain a concentration of 0.373±0.0001ppm in the bark and 0.370±0.0001ppm in the seed extract. The samples for FTIR analysis were oven-dried, mixed with KBr, crushed into thin pellets and run in the FTIR machine. The bands at 1743.65cm^{-1} and 1681.93cm^{-1} indicated a C=O stretching which implies the presence of a Ketone compound, at 1512.19cm^{-1} and 1465.90cm^{-1} indicated a C=C-C, aromatic ring showing the presence of aromatic compounds. The band at 137.89cm^{-1} indicated OH bend, alcoholic group implying the presence of phenols and tertiary alcohols. The bands at 1087.85cm^{-1} and 1033.85cm^{-1} are due to PO_3 stretch showing the presence of phosphate ions. These phytocompounds show the ability of the bark and seed extracts of *Zanthoxylum chalybeum* to contain various medicinal properties.

Key words: Phytochemicals, medicinal properties, *Zanthoxylum chalybeum*