

The Vitamin and Mineral Composition of Ethanol Leaf Extract of *Rauwolfia vomitoria*

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ABSTRACT

Medicinal plants have continued to show a dominant role in the healthcare system and this is mainly true in developing countries where herbal medicine has continuous history of long use. All chemicals and reagents used in this study were of analytical grade. This research was designed to determine the vitamin and mineral composition of ethanol leaf extract of *Rauwolfia vomitoria*. The result of vitamin composition showed that the ethanol leaf extract of *Rauwolfia vomitoria* is rich in vitamins A, C, E, D, B₁, and B₁₂. The results of mineral composition also revealed the presence of the following minerals in the following ranking: K (140.525mg/100g) > Mg (130.625mg/100g) > Na (120.675mg/100g) > Ca (115.575mg/100g) > Zn (24.275mg/100g) > Cu (1.6mg/100g) > Fe (1.075mg/100g) > P (0.95mg/100g), with K (140.525mg/100g) having the highest value. The results obtained from this research work indicated that the ethanol leaf extract of *Rauwolfia vomitoria* is rich in both vitamins and minerals and could be the reason the ethanol leaf extract *Rauwolfia vomitoria* is used in the treatment of many ailments and diseases in traditional medicine.

Keywords: Vitamin, Mineral composition, and *Rauwolfia vomitoria*

INTRODUCTION

Human beings have depended on nature for their simple requirements as being the sources for medicines, shelters, food stuffs, fragrances, clothing, flavours, fertilizers and means of transportation throughout the ages [1,2,3,4,5,6]. For the large proportions of world's population medicinal plants continue to show a dominant role in the healthcare system and this is mainly true in developing countries, where herbal medicine has continuous history of long use [7,8,9]. The development and recognition of medicinal and financial aids of these plants are on rise in both industrialized and developing nations [10,11,12]. The foundations of typical traditional systems of medicine for thousands of years that have been in existence have formed from plants [13,14,15,16,17]. The plants remain to offer mankind with new medicines. Some of the beneficial properties ascribed to plants have recognised to be flawed and medicinal plant treatment is based on the experimental findings of hundreds to thousands of years [18,20,21]. Chemicals known to have medicinal benefits are considered to be active ingredients or

active principles of natural medicines [22,23,24].

Rauwolfia vomitoria is one of the medicinal plants that have served all through the ages as the mainstay in the treatment and preservation of human health. It belongs to the family opocynacea and its common names include serpent wood, swizzler stick among others. The parts that are commonly used for herbal remedies are roots, root bark, leaves and stem-bark [25]. The plant is of different species. It has been used across its range in traditional medicine. A decoction or extract of the roots is extensively used to treat diarrhoea, jaundice, venereal disease, rheumatism and snake-bites, and is also used to reduce colic or fever, to calm people with anxiety or epilepsy, and to lower blood pressure [26]. The macerated root, or sometimes the pulped fruit, is used to treat a variety of skin conditions, and the bark, twigs and leaves are used as a purgative and emetic [27]. Most medicinal plants presently employed by local herbalists are used without much scientific information. It is therefore

important to access and document the ethno-medical claims of these medicinal plants. In view of the various traditional applications of *Rauwolfia*

vomitoria, scientific investigation will help in establishing its efficacy especially those which can be used in the treatment and management of several ailments.

Aim of the study

The aim of this study is to determine the vitamin and mineral composition of

ethanol leaf extract of *Rauwolfia vomitoria*



Figure 1: The leaves of *Rauwolfia vomitoria*

MATERIALS

Preparation of the Plant Extract

The leaves of *Rauwolfia vomitoria* were harvested and washed under tap water to remove contaminants and air dried under shade. They were pulverized using laboratory milling machine and sifted using 0.25 mm sieve. One thousand five hundred gram (1500g) of the powdered leaf sample of *Rauwolfia vomitoria* was

soaked in 7500 ml of ethanol for 48 hours with agitation. The resulting ethanol leaf extract was filtered using muslin cloth and evaporated to dryness using rotary evaporator at a temperature of 45°C. The concentrated ethanol leaf extract of *Rauwolfia vomitoria* was used for subsequent analyses.

METHODS

Determination of Vitamins

Vitamins were determined using standard methods of [2,5].

Determination of Mineral Contents of *Rauwolfia vomitoria*

Minerals were determined using standard methods of [2,3].

Determination of Sodium and Potassium

Sodium and Potassium were determined by flame photometric method of [3].

Statistical Analysis

Results were expressed as mean \pm standard deviations where applicable. The data were subjected to one-way analysis

of variance (ANOVA), followed by Post hoc Duncan multiple comparison test using

SPSS software version 21 and $p < 0.05$ was regarded as significant.

RESULTS

The Results of vitamin composition of *Rauwolfia vomitoria* ethanol leaf extract.

The vitamin assay results are represented in Figure 2. The results showed the presence of vitamins A, C, E, B1, D and B₁₂ in *Rauwolfia vomitoria* ethanol leaf extract.

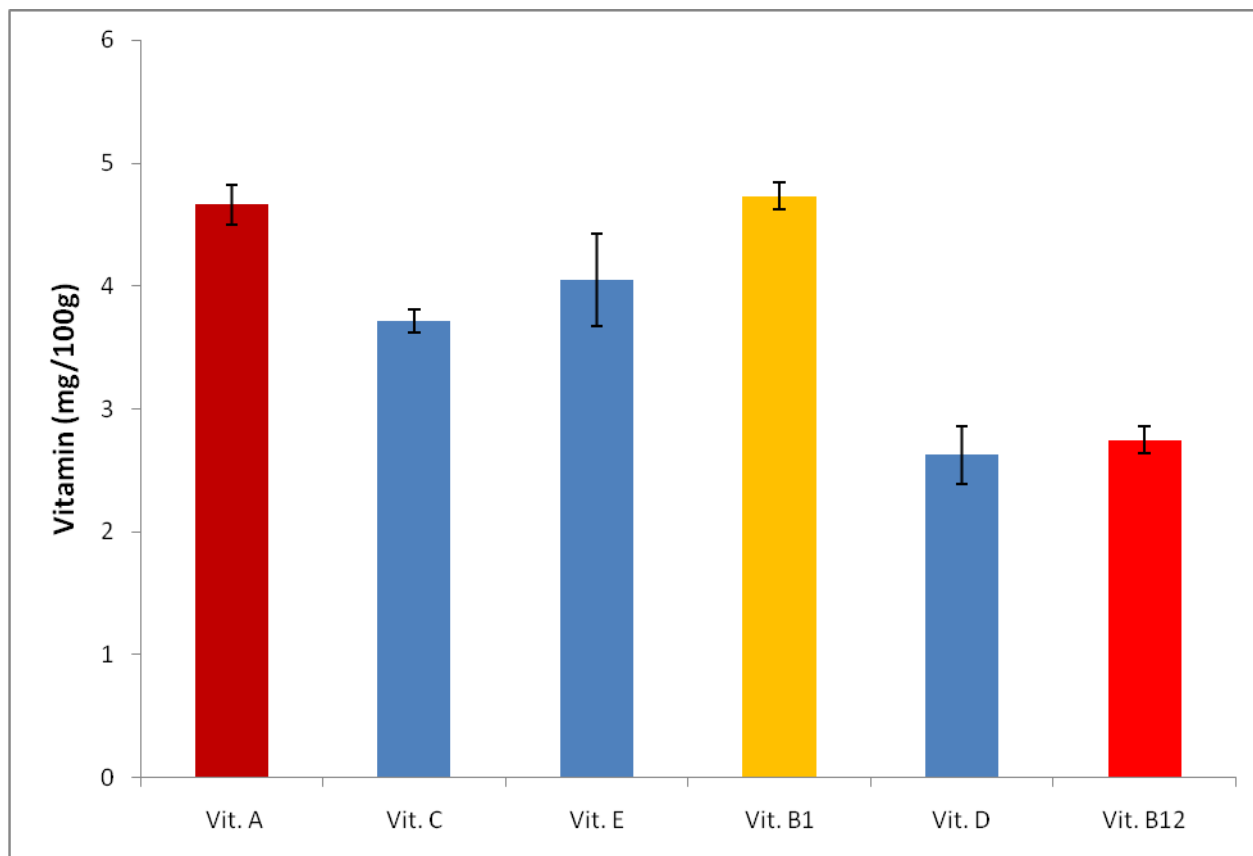


Figure 2: Vitamins composition of ethanol leaf extract of *Rauwolfia vomitoria*. Results are presented as mean \pm SD

The result of mineral content of *Rauwolfia vomitoria*

The results of mineral composition of *Rauwolfia vomitoria* as shown in figures 3 and 4 revealed the presence of the following minerals: Sodium, potassium, calcium, magnesium, copper, zinc, iron and phosphorous, with Potassium having the highest value. The magnitude of

occurrence of the minerals was in the following order K (140.525mg/100g) > Mg (130.625mg/100g) > Na (120.675mg/100g) > Ca (115.575mg/100g) > Zn (24.275mg/100g) > Cu (1.6mg/100g) > Fe (1.075mg/100g) > P (0.95mg/100g).

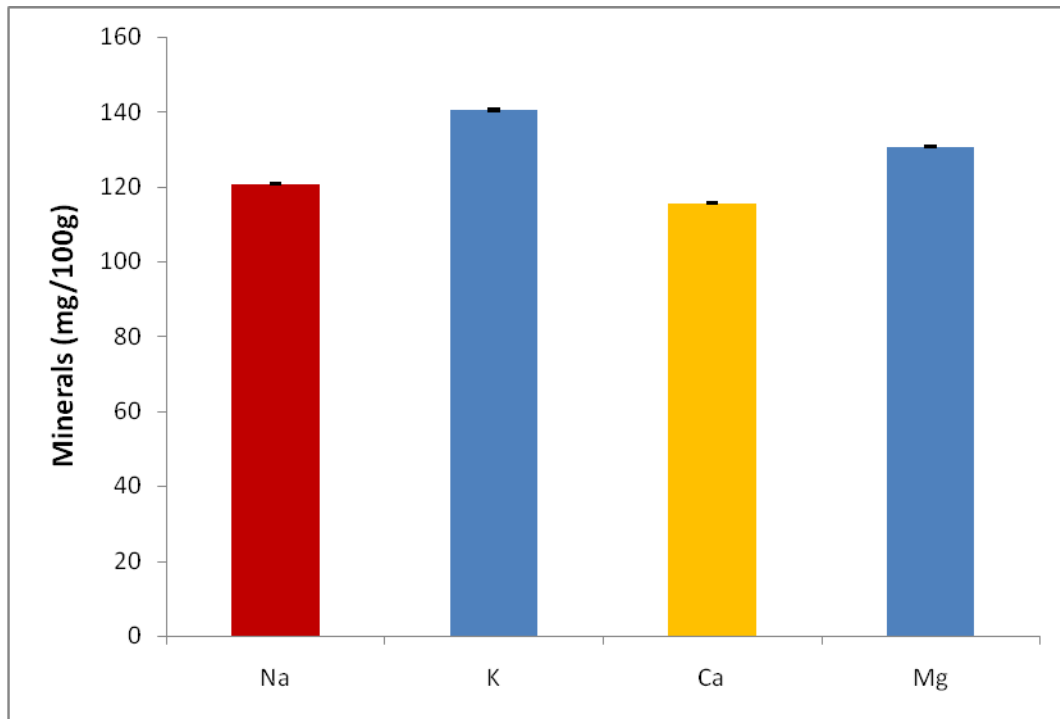


Figure 3: Mineral composition of ethanol leaf extract of *Rauwolfia vomitoria*. Results are presented as mean \pm SD

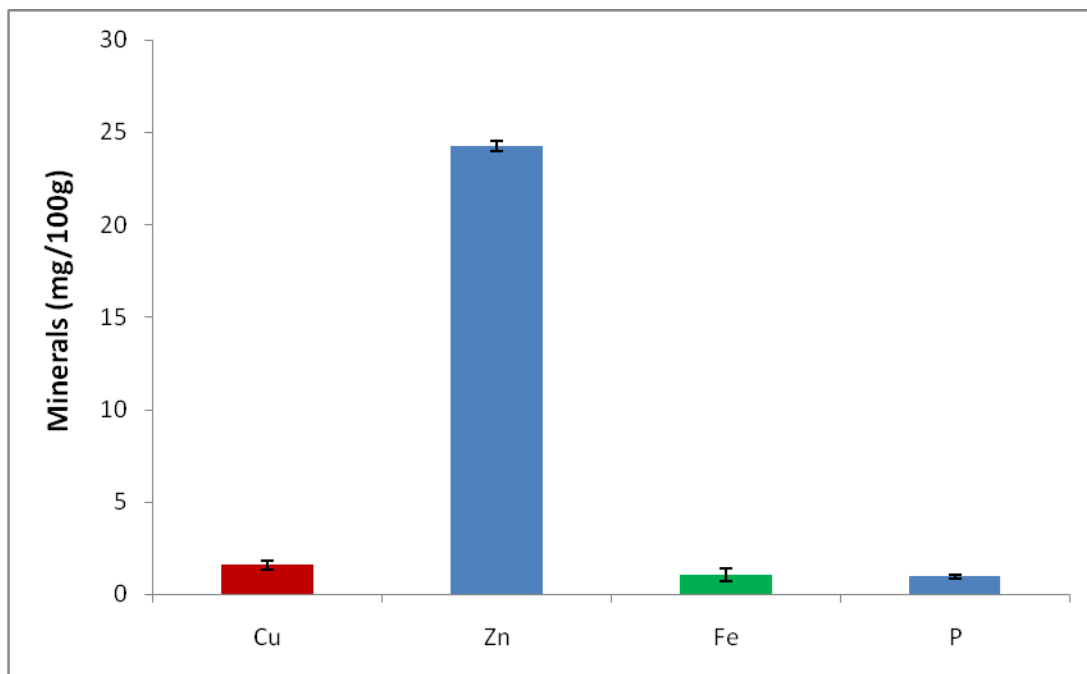


Figure 4: Mineral composition of ethanol leaf extract of *Rauwolfia vomitoria*. Results are presented as mean \pm SD

DISCUSSION

The result of vitamins composition of *Rauwolfia vomitoria* leaf as presented in figures 2 and 3 showed ethanol leaf extract is rich in vitamins A, C, E, D, B1, and B₁₂. This agrees with the work of [5]. Vitamin content of foods is known to have positive effects on health. Epidemiological studies have shown high intakes of vitamins to be associated with decreased incidence of some cancers and cardiovascular diseases [10]. The result of this research work showed that the ethanol leaf extract of *Rauwolfia vomitoria* contained appreciable amounts of vitamins which are nutritional requirements of both humans and livestock which suggest that these leaves could be useful as feed supplement to improve health and growth performance

The results obtained from this research indicated that the ethanol leaf extract of *Rauwolfia vomitoria* is rich in both vitamins and minerals and could be the

reason the ethanol leaf extract is used in the treatment of many ailments and diseases in traditional medicine. The results of mineral composition of *Rauwolfia vomitoria* are shown in figures 4 and 5 revealed the presence of the following minerals: K (140.525mg/100g) > Mg (130.625mg/100g) > Na (120.675mg/100g) > Ca (115.575mg/100g) > Zn (24.275mg/100g) > Cu (1.6mg/100g) > Fe (1.075mg/100g) > P (0.95mg/100g), with K (140.525mg/100g) having the highest value. These results agree with the work of [15], which showed the presence of minerals in medicinal plants in appreciable amounts. Minerals are required for normal growth, activities of muscles and skeletal development, cellular activities and oxygen transport in the body [15].

CONCLUSION

reason the ethanol leaf extract is used in the treatment of many ailments and diseases in traditional medicine.

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