



An Analysis of the Chemical Composition of Dehydrated Underutilized Hogweed (*Boerhaavia diffusa*) Root Powder

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ABSTRACT

The herb is distributed throughout India. Herbs play an important role in our day to day life. They were the only source of medicine in olden days. Even today herbs are equally important to modern drugs as they have fewer side effects when compared to synthetic drugs. It has a long history of uses by indigenous and tribal people and in Ayurvedic or natural herbal medicines. Extract of roots of *Boerhaavia diffusa* was evaluated for antistress, adaptogenic activity in albino mice, by swim endurance test and cold restrain stress. The extract improved the stress tolerance by significantly increasing the swim duration and reducing the elevated WBC, blood glucose and plasma cortisol. The objective of the present study is to determine the chemical composition of the *Boerhaavia diffusa* root powder. Products developed by *Boerhaavia diffusa* root powder were analyzed for moisture, ash, energy, fat, fiber, carbohydrate, iron, calcium and phosphorus. Moisture, ash, fat, crude fibre, protein and energy content were found 49.83%/100g, 4.16g/100g, 0.46g/100g, 4.5g /100g, 4.33g /100g, 133.88KJ respectively. Calcium content found to be 622mg/100g and phosphorous content of the *Boerhaavia diffusa* root powder was found to be 74.16 mg /100g.

Key words: *Boerhaavia diffusa*, Root powder, Chemical analysis.

INTRODUCTION

It has a long history of uses by indigenous and tribal people and in Ayurvedic or natural herbal medicines⁴. The major active principle present in the roots is alkaloid and is known as punarnava⁵. *Boerhaavia diffusa* occurs abundantly as a weed throughout India. It is a creeping and spreading perennial herb, with a stout root-stock and many erect or spreading branches⁶. The root is *Boerhaavia diffusa* mainly used to treat gonorrhoea, internal

inflammation of all kinds, dyspepsia, oedema, jaundice, menstrual disorders, anaemia, liver, gallbladder and kidney disorders, enlargement of spleen, abdominal pain, abdominal tumours, and cancers. It cures corneal ulcers and night blindness and helps restore virility in men. People in tribal areas use it to hasten childbirth⁷. It is a medicinal plant used in traditional medicinal practice and has been reportedly useful in the treatment of many diseases⁸.

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The swollen tap-roots when softened by boiling are applied externally as a poultice to draw abscesses and encourage the extraction of guinea worms. Apart from this, the root of *B. diffusa* is considered to have an expectorant action and thus used in the treatment of asthma, cough, stomach and intestinal colic, haemorrhage, oedema, anemia, jaundice, piles, rheumatism, eye disease, liver ailments, gonorrhoea, small pox, yaws, and cancer^{9,10}. It has also been used as a laxative, diuretic, emetic in large doses, antivenom, and in the treatment of heart disease¹¹.

MATERIAL AND METHODS

Boerhaavia diffusa roots were obtained from the field of Sam Higginbottom Institute of Agriculture, Technology and Sciences, (SHIATS) Allahabad district, India. They were mainly found to be growing near buildings and or in hard places with cement work. The roots were washed with water to remove the attached soil and dirt. After this, they were sliced to expose a greater surface area and to facilitate drying. Other ingredients for the development of the value added products like milk, fruits, suji etc. procured from the local market of the Allahabad, district (India). The standard procedure was slightly modified for the drying of *Boerhaavia diffusa* root. The *Boerhaavia diffusa* root (Mature and free from insects and diseases) were subjected to a very good washing with water as much as necessary to remove all the attached soil and dirt. The *Boerhaavia diffusa* root was cut into thin slices. The slices were kept equally sized and as thin as possible. The *Boerhaavia diffusa* root slices were arranged on the rack of a food dehydrator; not overlapping the slices for 2-6 hours. After this they were oven-dried at a temperature between 40-60°C for 4 hours. The *Boerhaavia diffusa* root was turned in every few polythene bags and stored at ambient temperature in dry place.

Chemical composition of the *Boerhaavia diffusa* root powder, this included estimation of moisture, ash, energy, protein, fat, fibre, calcium and phosphorous was estimated by the method of AOAC¹².

RESULTS AND DISCUSSION

The proximate composition of the *Boerhaavia diffusa* root powder is presented in Table 1.

The moisture content of *Boerhaavia diffusa* root powder was found to be 49.83 percent. The values compared favorably with the finding of Odebunmi *et al.*¹⁰, for Cocoyam but higher than the value recorded by Olubunmi *et al.*¹¹, for ginger. The difference of the moisture content could be due to the time interval between harvest and analysis, method of drying and strong and the nature of the roots. The ash content was observed 4.16g/100g. This slightly lower from the value of Iris potato (6.89%) reported by Odebunmi *et al.*¹⁰. The protein content was found to be 4.33g/100g but these values are lower when compared with those reported by Chaudhary and Dhantu¹². According to Chopra *et al.*¹³, *Boerhaavia diffusa* root are rich in Proteins and Fats. The root contains 14 amino acids including 7 essential amino acids. The value of fat content of *Boerhaavia diffusa* root powder was found to be 0.46g/100g. The values of energy content of *Boerhaavia diffusa* root powder was found to be 32.46 Kcal/100g but value are lower when compared with those Sheela *et al.*¹⁴, for underutilized greens. The energy content ranged between 17-97 Kcal/100g. The fat content was found to be 0.46g/100g but these value are lower when compared with those reported by Gokoglu *et al.*¹⁵, In this study the fat content was high because of the different methods (deep fry) of cooking.

The fiber content was found to be 4.5/100g but when compared with those reported by Das, Devi and Gogoi¹⁶. slightly increases from the value of green vegetable. They observed the crude fiber 0.81g content was increased because of the replacement of other ingredients with green vegetable. The calcium content of *Boerhaavia diffusa* root powder was found to be 622mg/100g. Similar study was also conducted by Das, Devi and Gogoi¹⁶. they studied the calcium content was high because of the different types of fishes (with bone) were used in different proportion in the place of other ingredients. The value of

Phosphorus content of *Boerhaavia diffusa* root powder was found to be 74.16mg/100g but these value are higher than the value recorded

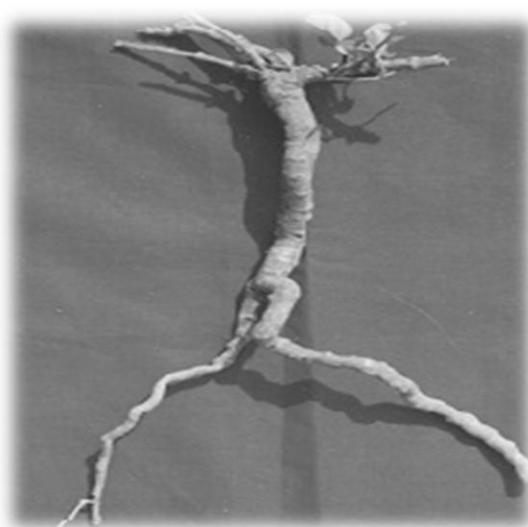
by Chaudhary and Dhantu¹². for *Boerhaavia diffusa* leaf.

Table 1: Mean nutrient composition of the root powder developed by incorporating *Boerhaavia diffusa* root powder (per 100 g)

NUTRIENTS							
Moisture %	Ash (g)	Fat (g)	Fiber (g)	Protein (g)	Energy (kj)	Calcium (mg)	Phosphorus (mg)
49.83	4.16	0.46	4.5	4.33	133.88	622	74.16
±0.49	±1.92	±0.08	±0.17	±0.12	±0.56	±0.46	±0.82

± = S.E

Root of *Boerhaavia diffusa*



CONCLUSION

From after mentioned the results it can be appropriately concluded that *Boerhaavia diffusa* root powder was found rich in proximate composition and mineral contents i.e. Calcium and Phosphorus. If root powder is used in different proportions it will be beneficial to combat various calcium deficiencies.

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