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Elemental Composition of Leaves of *Memecylon talbotianum* Brand., - Endemic Plant of Western Ghats

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ABSTRACT

Memecylon talbotianum Brand., an endemic plant of Western Ghats, was found in the Western Ghats regions of Karnataka. The plants were collected at Banajalaya of Sagara taluk and at Hidlumane falls of Hosanagara taluk, Shimoga district. The plant has been studied, identified, and its taxonomic position was assigned, the herbarium was prepared and preserved in the Department of Applied Botany, Kuvempu University. Simultaneously, the leaves of the plants were analyzed for their elemental components and nutritional values. Among the macronutrients, calcium was highest both in Banajalaya of Sagara and Hidlumane falls of Hosanagara, whereas phosphorous was minimum at Banajalaya of Sagar and sodium was minimum at Hidlumane falls of Hosanagara samples. The micronutrient value of iron was highest at both Hidlumane falls of Hosanagara and Banajalaya of Sagara samples and copper was lowest at Banajalaya of Sagara and zinc was lowest at Hidlumane falls of Hosanagara sample, respectively. The moisture was highest both at Banajalaya of Sagara and Hidlumane falls of Hosanagara samples, whereas ash value was low at Banajalaya of Sagara and crude fat was low at Hidlumane falls of Hosanagara sample among the different components of the nutritive values. The nutritive values ranged between 219.5 and 224.5 with an average of 221.66 at Banajalaya of Sagara and 223.5 and 241.5 with an average of 234.33 cal/100 g at Hidlumane falls of Hosanagara.

Key words: *Melastomataceae, Western Ghats, Nutritive value and Memecylon talbotianum Brand.*

1. INTRODUCTION

Memecylon Linn., belongs to the family Melastomataceae, is a shrub or small tree. The distribution, taxonomy, and uses of species of *Memecylon* have been studied by many investigators [1-6]. A few species of *Memecylon* have been used for therapeutic purposes. *Memecylon talbotianum* Brand., which is commonly found in Western Ghats of Karnataka, was collected from two regions of Shimoga district. The leaves were analyzed for nutritional value and elemental composition.

2. MATERIALS AND METHODS

2.1. Plant Sample Collection and Identification

The leaves of *M. talbotianum* Brand. were collected from two different regions of Karnataka. The samples were collected at Banajalaya, Sagar taluk and at Hidlumane falls, Hosanagara taluk of Shimoga district, Karnataka, India (Map 1). The species was identified with the help of some taxonomic literature (Flora of British India [Hooker, 1894]). Flora of Presidency of Madras [7], Flora of Davanagere district [4,8], Compendium of Indian Medicinal plants [2], Flora of Presidency of Bombay [6], The forest trees of Travancore [9], and Flora of South Indian hill stations (Photos 1 and 2) [10-12].

The voucher specimens are deposited as herbarium in the Department of Applied Botany, Kuvempu University. The collected leaves were washed thoroughly 2-3 times with running tap water and once with sterile water, shade dried, powdered, and stored in airtight bottles for further investigation (Photos 3 and 4).

2.2. Nutritive Value and Elemental Composition

The components of nutritive value and elemental composition were estimated by following the standard procedures [13-15] at the Department of Applied Botany, Kuvempu University and Central Coffee Research Institute, Balehonnur, using Atomic Absorption Spectroscopy and Flame Photometer.

3. RESULTS

The minimum, maximum, and average values of components of nutritive values, nutritive values, and elemental composition (macro, micro, and heavy

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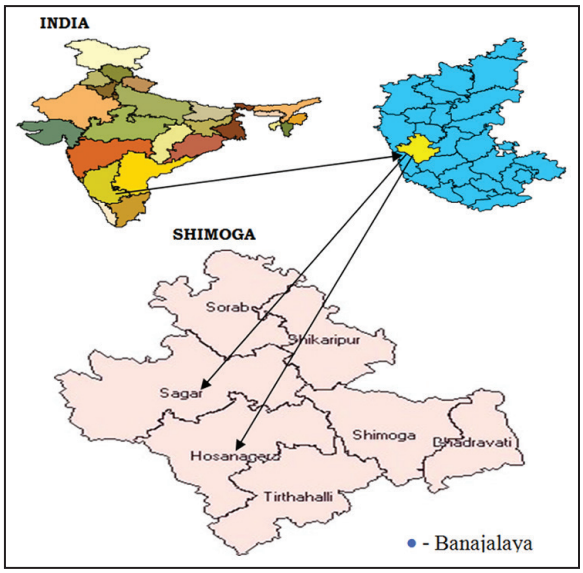

Map 1: Study area.

Photo 1: *Memecylon talbotianum* Brand. collected at Sagar.

Photo 2: *Memecylon talbotianum* Brand. collected at Hosanagar.

metals) are given in Figures 1-4.

3.1. Components of Nutritive Value

The percentage of moisture was varied between 43 and 47; 48 and 50; percentage of ash varied between 4 and 5; 2 and 3; percentage of crude fat value varied between 5.5 and 7.5; 5.0 and 6.5; percentage of crude fiber varied between 2 and 5; 3 and 6; percentage of crude protein varied between 14.76 and 16.64; 7.60 and 10.36, and percentage of carbohydrate 26.86 and 31.24; 31.14 and 36.4 at Hidlumane falls of Hosanagara and Banajalaya of Sagara samples, respectively. The highest average nutritive value of 234.33 and the lowest value of 221.66 cal/100 g were recorded at Hidlumane falls of Hosanagara and Banajalaya of Sagara samples, respectively (Figure 1).

Photo 3: Powdered samples of Sagara.

Photo 4: Powdered samples of Hosanagara.

3.2. Elemental Composition

3.2.1. Macronutrients

The average values of calcium were highest both at Hidlumane falls of Hosanagara and Banajalaya of Sagara samples. However, the values of calcium were followed by potassium, magnesium, phosphorous, and sodium at Hidlumane falls of Hosanagara, whereas the highest values of calcium are followed by sodium, potassium, magnesium, and phosphorous at Banajalaya of Sagara in their concentration (Figure 2).

3.2.2. Micronutrients

The iron was the dominant micronutrient, and it is followed by manganese, copper, and zinc at Hidlumane falls of Hosanagara and manganese; zinc and copper at Banajalaya of Sagara samples, respectively (Figure 3).

3.2.3. Heavy metals

The trace amount of lead and cadmium were recorded in the samples of Hosanagara (Figure 4).

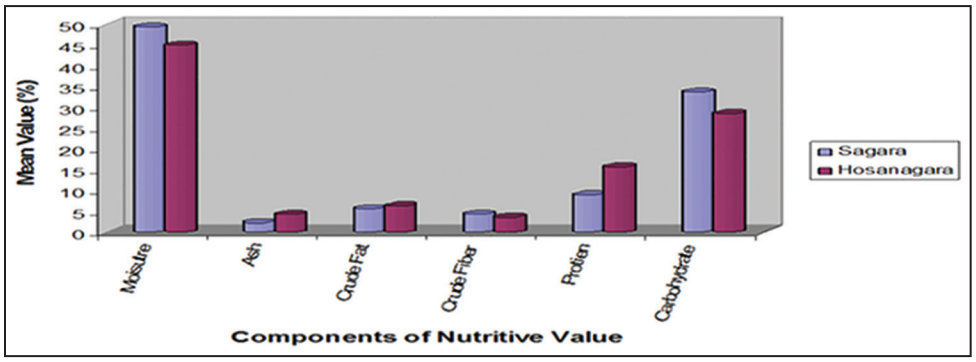

Figure 1: Comparative account of components of nutritive value of a *Memecylon talbotianum*.

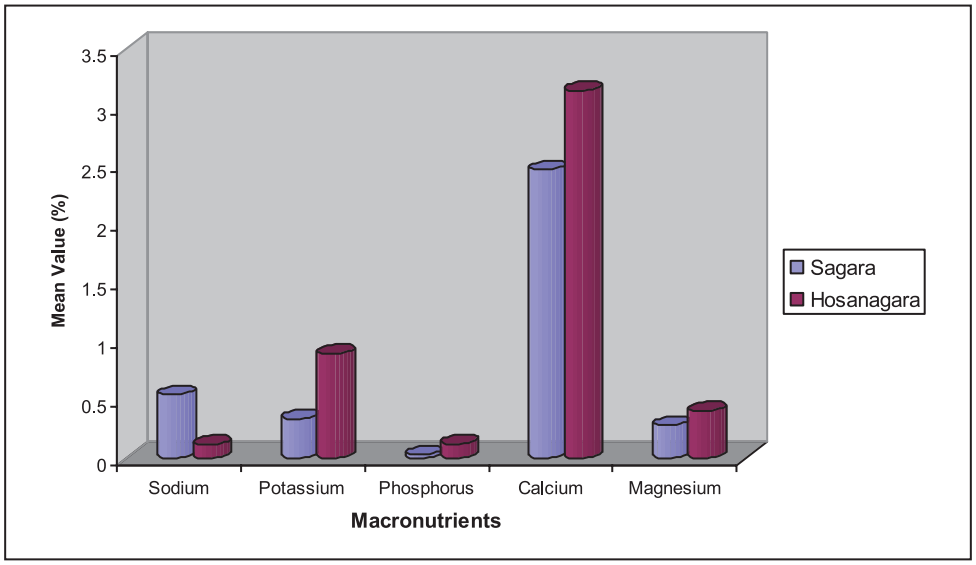

Figure 2: Comparative account of components of macronutrients of *Memecylon talbotianum*.

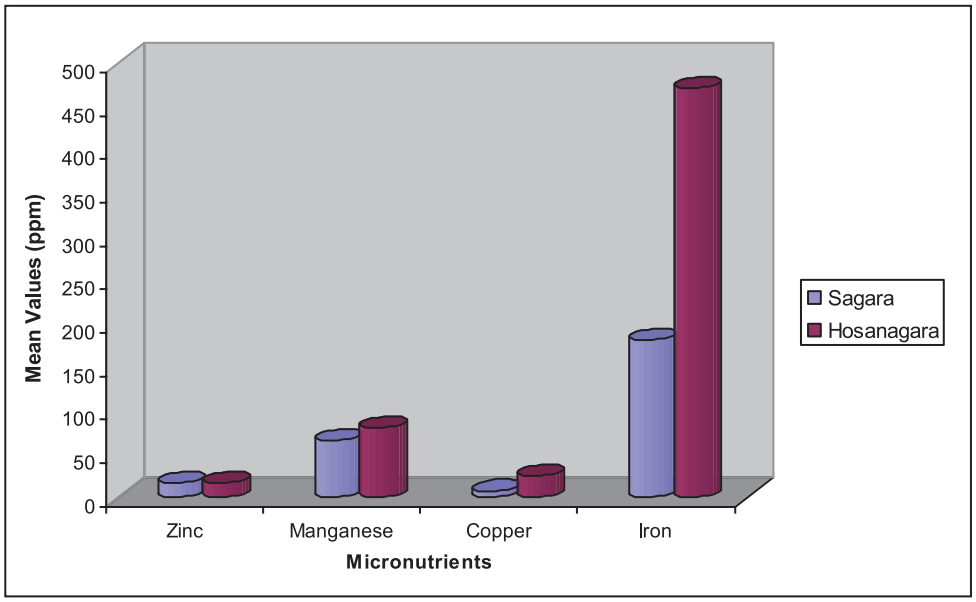

Figure 3: Comparative account of micronutrients value of a *Memecylon talbotianum*.

4. DISCUSSION

The results of the components of nutritive values reveal that there are no significant differences between the samples of Banajalaya and Hidlumane falls of Sagara and Hosanagara taluks of Shimoga district. Further, it is also confirmed that the nutritive values

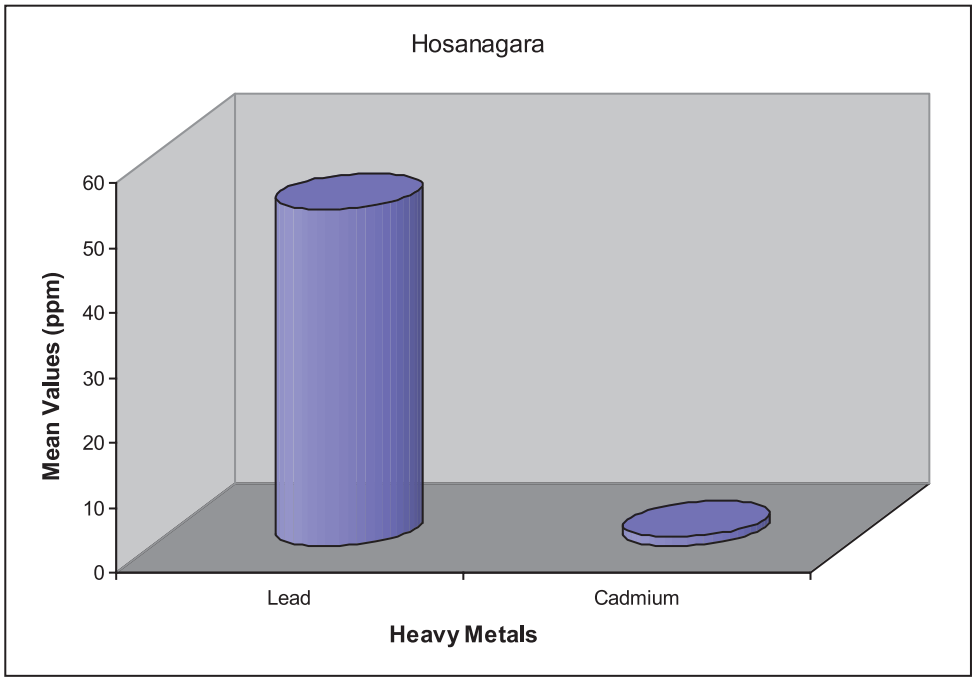

Figure 4: Comparative account of heavy metals value of a *Memecylon talbotianum*.

of Banajalaya and Hidlumane falls were 221.66 and 234.33 cal/100 g, respectively. Indrayana *et al*. (2005) reported that the values of nutritive value are important for the categorization of medicinal plants, and accordingly, they reported the importance of leaves of *Artocarpus heterophyllus* as fodder in addition to medicine.

Further, Hassan and Umar emphasized proximate composition (nutrition components, amino acid profile, and mineral constituents) for the assessment of nutritional value of leaves of *Momardica balsamina*. The studies of Isong *et al*., Anita *et al*., and Asibey-Berka and Tayie [16-18] reveal the importance of nutritional values of varieties of *Gnetum africanum*, nutritive and anti-nutritive value evaluation of sweat potatoes (*Ipomea batatos*) and importance of underutilized vegetables of Ghana.

The calcium was the highest both Banajalaya of Sagara and Hidlumane falls of Hosanagara samples which are followed by potassium, magnesium, phosphorous, and sodium in Hidlumane falls of Hosanagara, whereas calcium was followed by sodium, potassium, magnesium, and phosphorous in Banajalaya of Sagara samples (Figure 2). The iron was highest both in Banajalaya of Sagara and Hidlumane falls of Hosanagara samples, whereas the average values of iron at Hidlumane falls of Hosanagara were double the values of Banajalaya of Sagara. Copper was lowest at Banajalaya of Sagara and zinc was lowest at Hidlumane falls of Hosanagara samples (Figure 3). The trace amount of cadmium and lead were recorded only at Hidlumane falls of Hosanagara samples (Figure 4).

The extensive investigation has been carried out on macro, micro, and heavy metal components of medicinal plants [13,19-23]. Indrayana *et al*. (2005) discussed the importance of major elements of Uttaranchal, and Hassan and Umar (2006) also reported the mineral composition of leaves of *M. balsamina*.

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****Bibliographical Sketch***

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