

**REVIEW ON *Semecarpus coriacea* Thw. WITH THE COMPILATION OF THERAPEUTIC ACTIONS****Wijeysinghe. H.M.R.S<sup>1</sup>, Sakunthala H.S<sup>2</sup>, Gunarathna B.W.A.S<sup>3</sup>, Karunarathne R.K.A.N<sup>4</sup>**<sup>1, 2, 4</sup>Gampaha Wickramarachchi University of Indigenous medicine, Yakkala, Sri Lanka.<sup>3</sup>University college of Kuliyaipitiya, University of Vocational Technology, Kuliyaipitiya, Sri Lanka.**Corresponding Author:** [wijeysinghe@icloud.com](mailto:wijeysinghe@icloud.com)<https://doi.org/10.46607/iamj2811042023>**(Published Online: April 2023)****Open Access**

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**Article Received:** 18/03/2023 - **Peer Reviewed:** 28/03/2023 - **Accepted for Publication:** 09/04/2023.**ABSTRACT**

*Semecarpus coriacea* Thw. is an important medicinal plant well known for its medicinal value in Ayurveda and Indigenous systems of medicine in Sri Lanka. *Semecarpus coriacea* commonly known as *Badulla* has been used for various ailments since ancient times. In Sri Lanka *Semecarpus coriacea* Thw. (*Badulla*) is used as the main substitute for *Semecarpus anacardium* (*Bhallataka*). However, in Sri Lanka, the knowledge of this valuable plant is considerably low due to a lack of studies. Hence, the objective of this study was to compile data on *Semecarpus coriacea* Thw. (*Badulla*) regarding medicinal values, toxicity, and pharmacological properties compared with *Semecarpus anacardium* L. Available data was compiled through authentic Ayurveda texts, scientific journals, and from relevant medical practitioners in Ayurveda and traditional medicine through standard questionnaires. According to the final analysis, all collected data concluded that the properties of *Semecarpus coriacea* Thw. (*Badulla*) and properties of *Semecarpus anacardium* L. are similar to a large extent and used for curing various disease conditions for thousands of years back. Further, results indicated that Latex was the most effective plant part of *Badulla*, and the majority of (44.7%) traditional physicians concluded that it has been used commonly for skin diseases (*kushta*) as an external medicine.

**Keywords:** *Semecarpus anacardium* L., *Semecarpus coriacea* Thw. *Badulla*, *Kushta*, Ayurveda

## INTRODUCTION

Plant species were used for medicine in almost every country in the world for thousands of years back. The World Health Organization (WHO) estimated previously that 80% of the world's population relied on primary health care based on traditional medicines and there is every indication that this remains true today.

*Badulla*, (Family: Anacardiaceae) *Semecarpus coriacea* Thw. is a medicinal plant well known for its medicinal value in Ayurveda and Indigenous systems of medicine in Sri Lanka. In Sri Lanka *Semecarpus coriacea* Thw. commonly known as *Badulla*, which has been used in various traditional systems of medicines for various ailments since ancient times and it is classified in Ayurveda under the category of toxic plants.

It should be used with caution and in therapeutic uses and also it should be purified before being used for treatments <sup>1</sup>. It should not be used in small children, very old persons, pregnant women, and individuals of the predominant *pitta* constitution.

In Sri Lanka *Semecarpus coriacea* Thw. (*Badulla*) is used as the main substitute for *Semecarpus anacardium* L. (*Bhallataka*) <sup>2</sup>. Both plants are categorized under the same family Anacardiaceae. Ayurveda texts have mentioned that therapeutic actions, *Guna karma*, *Matra* (Dosage), *Shodhana vidhi* (Purification), and *Prayoga* (Applications) of both plants show a similarity <sup>1</sup>.

However, in Sri Lanka, the knowledge of this valuable plant is considerably low due to a lack of studies. The most likely reason could be their popularity for causing dermatitis reactions, which can occur even by touching the plants. Hence, the objective of this study was to collect literature data on *Semecarpus coriacea* Thw. (*Badulla*) regarding medicinal values, toxicity, pharmacological properties as per Ayurveda, and scientifically validated biological activities by correlating with *Semecarpus anacardium* L. (*Bhallataka*) It is a very important and urgent need to compile the data on the *Badulla* plant before the information is hidden over the time.

## 2. Botanical Evaluation of *Semecarpus coriacea* Thw.

*Badulla*, *Semecarpus coriacea* Thw. is an endemic plant in Sri Lanka. A medium-sized tree with smooth shining bark. Ultimate branchlets are thick, with prominent leaf scars. Leaves with short stalks, blades thick, coriaceous, obovate, oblong, base cuneate, apex rounded or slightly retuse six pairs of lateral nerves, curved and connected near the margin, tertiary nerves, and veins prominent on the lower face. Inflorescence of terminal panicles, rather short (8-15 cm), with thick glabrous or slightly pilose branches. Drupe over 2.5 cm wide, 2 cm long, compressed, apiculate: receptacle small, 10 mm, scarcely cupped. Commonly found in montane forests above 1200 m. Flowering in April, fruits June-November <sup>1,2</sup>

(Figure 1.1, Figure 1.2, Figure 1.3, Figure 1.4).



Figure 1.1 *Semecarpus coriacea* Thw. (Ventral side)



Figure 1.2: Leaves of *Semecarpus coriacea* Thw (Dorsal side)



Figure 1.3. Bark of *Semecarpus coriacea* Thw.



Figure 1.4: Fruits and Leaves (*Semecarpus coriacea* Thw.)

### 3. Study Design

Primary Data for the study were collected from ten knowledgeable persons and 20 registered Ayurveda and traditional physicians about *Semecarpus coriacea* (*Badulla*), by using in-deaf interviews and standard questionnaires. Secondary data have been gathered from relevant authentic texts as well as scientific journal articles. Authentic texts that were used for the study include prominent texts used in Ayurveda medicine and Sri Lankan indigenous medicine regarding medicinal plants. Published data regarding the biological activities, phytochemistry, and ethnomedicinal uses of *Semecarpus coriacea* were collected. A comprehensive search of the literature was conducted by several electronic databases, the following keywords were used for the search, “*Semecarpus coriacea*,” “*Badulla*,” “*Senkottam*,” and “*Semecarpus anacardium*.” 62 research articles published within the period of 2000 to 2022 were selected for the present study.

### 4. Conservation methods

Live Plant conservation sites are Peradeniya Botanical Garden, Nawinna Bandaranayake Memorial Ayurvedic Research Institute, Bathgoda, Pattipola, Pinnaduwa and Pallekele herbal gardens in Sri Lanka, and dry specimens are found in the National Herbarium of Peradeniya Botanic Gardens and Herbarium of Nawinna Bandaranayake Memorial Ayurvedic Research Institute in Sri Lanka<sup>2</sup>.

### 5. *Semecarpus* species found in Sri Lanka (Varieties)

According to Flora of China, there are about 77 genera with 600 species in the world<sup>3</sup>. As mentioned in

the National Red List 2012, there are 11 endemics out of 14 species belonging to 6 genera in Sri Lanka<sup>4</sup>. Genus *Semecarpus* has about 50 species dispersed worldwide and 12 of them are in Sri Lanka All these species are endemic and commonly known as *Badulla*<sup>5</sup>.

### 6. Purification and Toxicity of the plant

*Ashudda* / Overdose Symptoms include a Burning Sensation, Itching of the Angus and Penis, Excessive sweating, and Excessive thirst. Symptoms of high toxicity include Blood in Urine, Emergence of body lumps, if symptoms are sever, they should be stopped treating with *Badulla* and must take antitoxic drugs like Coconut, Sesame seeds, and *Aralu* (*Terminalia chebula*)<sup>2</sup>

According to Ayurveda medicine *Badulla* should be used after proper purification. Medicine should be taken under medical supervision and should stop using *Kakarashataka*. Due to its hot potency, it should not be used in extremely hot weather. It is best to be avoided by children, pregnant and lactating mothers. A fatal dose may lead to death within 12-24 hours and excess use of *Badulla* may induce abortion in pregnant women. The Latex and oils in the kernel of the seed are toxic to the skin. When this comes in contact with the skin, blisters, itching, and swelling appear. Ghee and coconut oil ointment are beneficial for treating this toxic symptom<sup>1,2,6</sup>.

*Badulla* seeds should be purified in the same way as a *Bhallataka*. The face of the fruit should be cut and pressed hard for a week with brick powder, after which the cloth should be tied and then washed with hot water. Before doing this work, coconut oil should

be applied to the hands. Then the seeds should be soaked with cow's milk using *Dola yantra*. Another method for purification is boiling the nuts and washing them with cold water. Crushed nuts mixed with

ghee and fried until smoky. The body should not be exposed to this Smoke and Coconut oil can be applied for allergies<sup>2</sup>.

### 7. Ayurveda View of *Badulla* (*Semecarpus coriacea* Thw.)

<i>Rasa</i> (Taste)	<i>Tikta</i> (Bitter), <i>Katu</i> (Pungent), <i>Kashaya</i> (Astringent)
<i>Guna</i> (Property)	<i>Laghu</i> (Light to digest), <i>Snigdha</i> (Unctuous), <i>Ruksha</i> (Dryness)
<i>Vipaka</i> (Transformation)	<i>Madhura</i> (Sweet)
<i>Virya</i> (Potency)	<i>Ushna</i> (Hot)
<i>Prabhava</i> (Inexplicable nature)	<i>Rasayana</i> (Rejuvenation)

Table 1. Properties of *Semecarpus coriacea* Thw.<sup>2</sup>

#### 7.1 Systemic actions of *Badulla* (*Semecarpus coriacea* Thw.)

01	Skin	<i>Swedajanaka</i> <i>Kushtagna</i> (Cure skin diseases)
02	Nervous System	<i>Medhya</i> (Improve intelligence) <i>Nadi Balakaraka</i> (Nerve tonic)
03	Gastrointestinal System	<i>Deepana and Pachana</i> (Appetizer and Digestive) <i>Bhedana</i> (Induces purgation) <i>Yakruththejaka</i> (Stimulate liver functions) <i>Krimigna</i> (Useful in worm and microbial infections)
04	Circular System	<i>Hrth Uthejaka</i> (Stimulate heart) <i>Shota hara</i> (Reduce edema)
05	Respiratory System	<i>Kapha Nissaraka</i> (expectorant)
06	Urinary System	<i>Mutravardaka</i> (Diuretic)
07	Reproductive System	<i>Kamoththejaka</i> (Increase the libido) <i>Shukragna</i> (Decrease the amount of sperm) <i>Garbasha Uththejaka</i> (Uterine tonic)

Table 2. Systemic actions of *Badulla* (*Semecarpus coreasia*)<sup>1</sup>

### 8. Ayurveda View of *Semecarpus anacrdium* L.

Characters	<i>Bhava Prakasha</i> <sup>7</sup>	Ayurveda Pharmacopeia <sup>1</sup>	<i>Dravya Guna Vignana</i> <sup>8</sup>
<i>Guna</i>	<i>Snigdha</i>	<i>Laghu</i> <i>Snigdha</i> <i>Ruksha</i>	<i>Laghu</i> <i>Snigdha</i> <i>Theekshna</i>
<i>Rasa</i>	<i>Madhura</i> <i>Kashaya</i>	<i>Kashaya</i> <i>Madhura</i>	<i>Madura</i> <i>Kashaya</i>
<i>Vipaka</i>	<i>Madhura</i>	<i>Madhura</i>	<i>Madhura</i>
<i>Veerya</i>	<i>Ushna</i>	<i>Ushna</i>	<i>Ushna</i>
<i>Dosha</i>	<i>Kapha - Vata Samaka</i>	<i>Kapha, Vata samaka</i> <i>Pitta Samshodaka</i>	<i>Kapha, Vata samaka</i> <i>Pitta Samshodaka</i>

Table 3. Properties of *Semecarpus anacrdium* L. according to Ayurveda authentic Texts.

### 8.1 Parts of Use (*Vyawaharika Anga*)

Seeds, flowers, Seed Oil, Kernel of Seeds, and Latex are the commonly used plant parts of (*Badulla*) *Semecarpus coreasia*<sup>2</sup>. Seeds, Flowers, Seed Oil, and Kernel Seeds are the commonly used plant parts of *Semecarpus anacardium* (*Bhallataka*)

### 8.2 Systemic Actions of *Semecarpus anacardium* L.

01	Skin	<i>Swedajanaka</i> <i>Kushtagna</i>
02	Nervous System	<i>Medya</i> <i>Nadi Balakaraka</i>
03	Gastrointestinal System	<i>Deepana</i> <i>Pachana</i> <i>Bhedana</i> <i>Yakruththejaka</i> <i>Krimigna</i>
04	Circular System	<i>Hrth Uthejaka</i> <i>Shotahara</i> <i>Swetha kanika vardaka</i>
05	Respiratory System	<i>Kapha nissaraka</i>
06	Urinary System	<i>Mutravardaka</i>
07	Reproductive System	<i>Kamoththejaka</i> <i>Shukrajanaka</i> <i>Garbasha uththejaka</i> <i>Vrshya</i> (Increase sexual potential)

Table 4. Systemic actions *Semecarpus anacardium* L.<sup>1</sup>

## DISCUSSION

*Semecarpus coriacea* Thw. (*Badulla*) plant consider one of the important medicinal plants in Sri Lanka and is probably used as a substitute for *Semecarpus anacardium* L. (*Bhallataka* plant). In Sri Lanka, twelve species of local plants have been reported that belong to the genus *Semecarpus* according to available data all these plants are endemic to Sri Lanka<sup>9</sup>. Europeans referred to *Semecarpus anacardium* L. as the marking nut and in Asian countries, this plant is commonly known as *the dobhi* nut tree because washer men used it to mark textiles and apparel before washing since it left a mark that was insoluble in water<sup>9</sup>. According to literature analysis both *Semecarpus coriacea* Thw. (*Badulla*) and *Semecarpus anacardium* L. (*Bhallataka*) plants were categorized under the same family *Anacardiaceae*. Ayurveda texts also mentioned therapeutic actions, *Guna karma* (properties), *Matra* (dosage), *Shodana*

*vidi* (purification methods), and *Prayoga* (usage) of both plants were similar to a large extent. The data about the *Badulla* plant was reported only in the book *Compendium of Medicinal Plants* and the book of *Medicinal plant used in Ceylon*. And so far, a limited number of research have been done on the *Semecarpus coriacea* Thw. (*Badulla*) plant. According to the Ayurvedic texts (*Bhavaprakash Nigantu*, *Raj Nigantu*, *Shaligrama Nigantu*, *Kaiya deva Nigantu*, *Compendium of medicinal plants*, *Badulla* is mostly used for *Kushta* (Skin Diseases) (8.33%), *Gulma* (Abdominal lump) (8.33%), *Anaha* (Flatulence) (6.94%), *Krimi* (Worm infection) (6.94%), and *Grahani rogas* (Malabsorption Syndrome) (6.94%).

According to data gathered from indigenous practitioners Latex (33%) was the most used plant part of *Semecarpus coriacea* Thw. (*Badulla*). Nuts, latex, and oil obtained from the seeds of the *Badulla* plant were traditionally used in the preparation of medi-

cines to treat various diseases like *Vrana* (Ulcers), *Kushta*, *Shota* (Edema), *Arshas* (Hemorrhoids), *Indraluptha* (Alopecia areata), *Krimi Roga* (Worm and microbial infections), *Visha* (Poison), *Madumeha* (Diabetic Mellitus), *Ajeerna* (Indigestion), and *Pakshagatha* (Paralysis). Further majority of indigenous practitioners were (77%) confirmed that *Semecarpus coriacea* Thw. contained important medicinal properties and the majority of them (88%) confirmed *Semecarpus coriacea* (*Badulla*) plant use as an External Drug. Further, *Badulla* has been mostly used for *Kushta* (44.7%), *Vrana* (15.7%), and, *Arsha rogas* (18.7%), as well as being widely used for many kinds of diseases. According to traditional physicians also the properties of the *Badulla* plant and *Bhallataka* plant were similar to a large extent. *Ballathaka* is mentioned in Ayurveda under the category of *Upavisha*. *Acharya* Charaka, *Semecarpus anacardium* is mentioned under *Dipaniya*, *Bhedaniya*, *Kusthaghna*, *Mutrasangrahara* and both *Susrutha* and *Vagbhata acharyas* mentioned it under *Nyagrodhadi ghana* and *Mustadighana*<sup>7</sup>. In classical terms, it can be explained that the properties of drugs are responsible to break the *Samprapti* of diseases.

According to previous research articles, *Semecarpus anacardium* is used for various medicinal properties. The fruit and nut extract shows various activities like anti-inflammatory, antioxidant, antimicrobial, anti-reproductive, CNS stimulant, hypoglycemic, anticarcinogenic and hair growth promoter, anti-arthritis effect, anti-carcinogenic activity, hypoglycemic activity, cardioprotective, hepatoprotective, neuroprotective, and hypolipidemic activity<sup>10</sup> However, due to a lack of reliable scientific investigations, *Semecarpus* species knowledge is extremely limited in Sri Lanka. The most obvious explanation is that they are well-known for triggering dermatitis reactions, which can happen even when simply touching the plants. These reactions are known as skin inflammations because they cause an itchy rash on swollen, reddish skin. According to *Ayurvedic* medical professionals, *Badulla* sap can result in blindness, and from personal experience, the impact

of the plant's leaves on the eyes can result in burning and itching. Additionally, the toxins released by these plants have the potential to give people headaches and other bodily discomfort. Therefore, the use of this valuable plant has been decreased<sup>5</sup> these conditions can be avoided by following proper purification techniques before using them for a medicine according to the *Shodhana* methods<sup>1</sup>. Previous studies show that purification improves the yield, reduces the phenolic and flavonoid content, and converts toxic urushiol into a nontoxic anacardol derivative thereby reducing toxicity<sup>11</sup>.

## CONCLUSION

In this study, it has been shown that both *Semecarpus coriacea* Thw. (*Badulla*) and *Semecarpus anacardium* L. (*Bhallataka*) plants contain similar properties, therapeutic actions, and uses to a large extent. According to primary and secondary data analysis, all collected data concluded that Latex is the most effective plant part relevant to *Semecarpus coriacea* Thw. (*Badulla*) and it is mostly used as an external medicine. Further, *Semecarpus coriacea* Thw. (*Badulla*) plant can be effectively used as a therapeutic agent for the management of skin diseases (*Kushta*). It is important to reveal the detailed mechanism behind the traditional remedies, therapeutic activities, and phytochemicals of *Semecarpus coriacea* Thw. (*Badulla*) for further studies. It is also important to compare and analyze the quality of the *Badulla* plant by following different methods of detoxification. Further, various clinical studies and laboratory investigations should be performed to confirm the effectiveness of the *Semecarpus coriacea* Thw. (*Badulla*) plant.

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