



## PHARMACOGNOSTICAL PHYTOCHEMICAL SCREENING OF *ARISTOLOCHIA BRACTEOLATE* (ARISTOLOCHIACEAE)

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### ABSTRACT

*Aristolochia bracteolata* is a small glabrous shrub occurring in India. It belongs to the family Aristolochiaceae. The whole plant is used in various ailments like abortifacient, alterative, anthelmintic, antiperiodic, emmenagogue and purgative. The stem and root having the aristolochia acid (Alkaloid). The leaves and roots are used to rid the body of Guinea worm (a parasitic infection caused by a nematode). In present study was macroscopical, microscopy, physicochemical parameters (extractive values, crude fibre content, ash values, foreign organic matter), fluorescent analysis, plant cell inclusions reported. The ethanolic plant extraction was carried out by using Soxhlet apparatus. The extract was screened for phytochemical properties by using colour reaction test.

**Key Words:-** *Aristolochia bracteolata*, Antiperiodic, Macroscopical, Microscopy, Soxhlet.

### INTRODUCTION

#### Scientific classification

Kingdom: Plantae  
Phylum: Tracheophyta  
Class: Magnoliopsida  
Order: Piperales  
Family: Aristolochiaceae  
Genus: Aristolochia  
Species: *Aristolochia bracteolata*

#### Vernacular names

English: Worm killer, Indian birth wort  
Malayalam: Adhthinnappala, karalakam,  
Hindi-Kidamari,  
Tamil-Adu tinna palai,  
Telugu: Gudide Gaddithaigadapara  
Kannada: Sanajali-hullu

Marathi: Gandhani

Sanskrit: Pattra- banga

*Aristolochia bracteolata* is a perennial, or rarely annual, mostly prostrate but occasionally climbing or suberect, unpleasantly smelling herb growing from 10 - 40 cm long. The plant is usually gathered from the wild and is used locally in traditional medicine. It is sometimes cultivated for medicinal use in India. Grows along the banks of the Ganges and in southern India. It is waste land weed (Observ, 1788; Hook F, 1886).

#### Cultivation

*Aristolochia bracteolata* is propagation by seed. A plant of the drier tropics and subtropics, usually growing where there is a distinct dry season. The flowers of many species in this genus form an intricate trap for pollinating insects. The insects are tempted to an area of the flower where they are unable to grip and they slide down into the utricle - downward pointing hairs prevent them climbing out. The trap helps to ensure the fertilization of the flowers and the insects are eventually

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released.

### Medicinal uses

- The whole plant is very bitter and has abortifacient, alterative, anthelmintic, antiperiodic, emmenagogue and purgative properties. It should be used with great caution since the plant can be toxic to mammals. The stem and the root contain the alkaloid aristolochic acid.
- The dried, powdered root has been shown to increase the contractions of the uterus during labour. It has been used as a substitute for ergot.
- The leaves and roots are used to rid the body of Guinea worm (a parasitic infection caused by a nematode)
- The powdered roots are combined with castor oil (from *Ricinus communis*) and used in the treatment of colic, amenorrhoea, dysmenorrhoea, intermittent fever and worms.

Externally, its juice is applied to foul and neglected ulcers to destroy insect larvae. It is also used to treat scorpion bites (Hook F, 1886; Gamble F, 1925).

## MATERIALS AND METHODS

### Plant material

The plant of *Aristolochia bracteolata* was collected from Thirumalaisamudram 7km away from Thanjavur (Tamil Nadu) in the month of December 2010. The plants was identified by local people of that village and authenticated by Dr. N.Ravichandran, Asst. Professor, Drug Testing Laboratory, CARISM, SASTRA University Thanjavur, and the Voucher specimen is preserved in laboratory for future reference.

### Chemicals

All the reagents used were of analytical grade obtained from S.D. fine chemicals, Ltd, and Hi Media, Mumbai.

### Pharmacognostical Screening of Plants

Macroscopic Characters and Physiochemical Parameters of *Aristolochia bracteolata* leaf and leaf powder: The Macroscopic evaluation was carried out for shape, size, colour, odour, taste and fracture of the drug. Different physiochemical values such as Ash value, extractive values, loss on drying, foreign organic matter, Crude fiber content, were determined and reported on Table 1.

### Preparation of extract from *Aristolochia bracteolata* leaf powder:

The leaves were dried under shade, powdered and passed through 40meshes and stored in closed vessel for

further use. The dried powder material (150g) was subjected to soxhelt extraction with ethanol for continuous hot extraction for 24 hours. The extracts were concentrated under reduced pressure to obtain the extracts solid residues. The percentage value of extract was 29 (%w/w).

### Phytochemical evaluation of ethanolic leaf extracts of *Aristolochia bracteolata*

The Ethanolic Extract of *Aristolochia bracteolata* (Leaf) was subjected to preliminary Phytochemical tests followed by the methods of Harbone (1998), and Trease and Evans (1983) and the phyto constituents reported in table 2 (Trease GE, Evans WC, 1983; Harborne JB, 1998; Matlwaska, 2002).

### Fluorescence analysis study of *Aristolochia bracteolata* leaves powder:

Fluorescence analysis study of powdered drug material with different reagents was carried out to observe the colour reactions reported on the table 3.

### Study of Plant cell inclusions:

Plant cell inclusions study of powdered drug material with different reagents was carried out to observe the colour reactions reported on table 4.

### General chemical and Micro chemical Tests:

General chemical and Micro chemical tests of powdered drug material with different reagents was carried out to observe the colour reactions to identify the compound reported on the table 5 (Kokate CK, 2009).

### Leaf constants:

Vein Islet number, vein termination number, stomatal number and stomatal index was carried out to observe microscopically reported on table 6 (Khandelwal KR, 2002).

## RESULTS

Prostate herb and often the maximum height is 50cm. Leaves are cordiform or reniform, 4-7× 5-9cm, 5-nerved from base. Bracts are cordate-orbicular, leaf margin entire or wavy. Flowers dark purple, 5cm long the limb entire, 1-lipped; lip 3cm long, rolled back, emarginated. Fruits are *Capsule* 2.5×1.5cm in size and the seeds are numerous and the seeds cordate in shape.

### Transverse section of Leaf *Aristolochia bracteolata*

The T.S. of leaf midrib consists of epidermis, cortex and vascular bundle. The epidermis made up of single rows, short ovoid cells and the outer cell wall

contains cuticle. The cortex consists of 4 rows of short, ovoid parenchymatous cells. The vascular bundles is single, globular shaped consists of xylem, cambium and phloem. The xylem cells are surrounded by 2 rows of phloem cells. The lamina consists of single rows of elongated cells and the outer cell was contains cuticle. The palisade cells are single rows, elongated with chloroplasts and arranged without intercellular space. The spongy parenchyma cells are 2-3 rows polygonal with intercellular space. The bundle sheath xylem cells are spiral thickening.

The epidermal cells of the leaf having anomocytic type of stomata.

#### Physiochemical Parameters

The extractive value was highest in water and was recorded to be 24%w/w, and ethanol soluble extractive value was about 14.4 %w/w. The different ash values and the different physiochemical parameters were screened and are presented in the table 1.

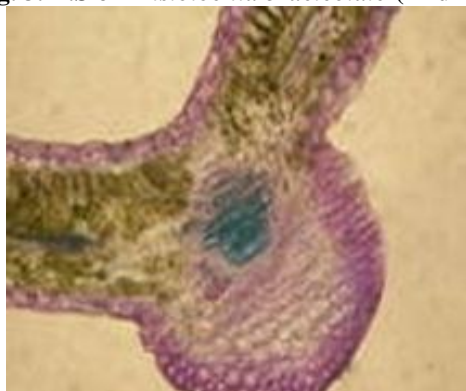
**Fig. 1. *Aristolochia bracteolata***



**Fig. 2. *Aristolochia bracteolata***



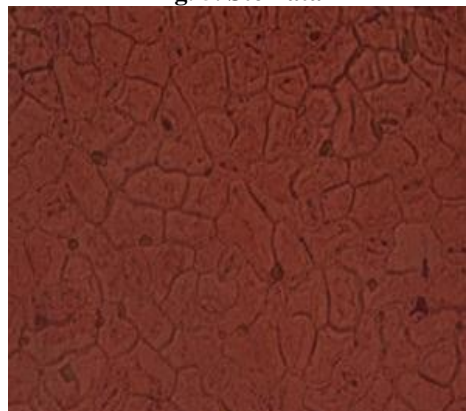
**Fig. 3. T.S of *Aristolochia bracteolata* (Mid rib)**



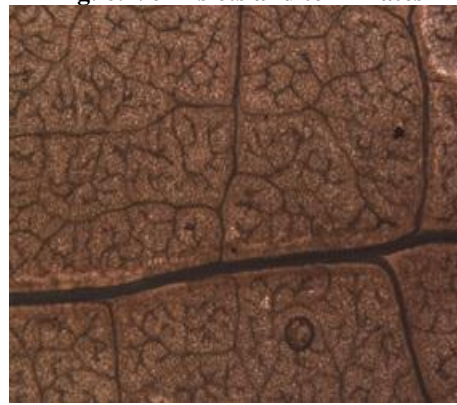
**Fig. 4. T.S of *Aristolochia bracteolata* (Lamina)**



**Fig. 5. Stomata**



**Fig. 6. Vein islets and terminates**



**Table 1. Physiochemical Parameters of *Aristolochia bracteolata* leaf Powder**

S.No	Parameters	<i>Aristolochia bracteolata</i>
1.	Hexane Soluble extractive	8%
2.	Pet ether Soluble extractive	2.4%
3.	Chloroform Soluble extractive	4.5%
4.	Acetone soluble extractive	4.8%
5.	Ethanol soluble extractive	14.4%
6.	Ethyl acetate soluble extractive	8%
7.	Methanol soluble extractive	13.6%
8.	Water soluble extractive	24%
9.	Foreign organic matter	2%
10.	Loss on drying	3%
11.	Crude fibre content	21%
12.	Total Ash	5%
13.	Acid insoluble ash	2%
14.	Sulphated ash	12%
15.	Water Soluble ash	1%

**Table 2. Preliminary Phyto chemical Analysis of ethanolic leaf extracts of *Aristolochia bracteolata***

S.No	Phytoconstituents	<i>Aristolochia bracteolata</i>
1.	Alkaloids	+
2.	Amino acids	+
3.	Anthraquinones	-
4.	Carbohydrates	+
5.	Flavonoids	+
6.	Phenolic groups	+
7.	Saponins	+
8.	Steroids	-
9.	Tannins	+

+ = Present    - = Absent

**Table 3. Fluorescence analysis study of *Aristolochia bracteolata* Lam., leaves powder**

S.No	Sample	Colour in Day light	Colour in UV
1.	Powder	Green	Green
2.	Powder + 0.1N Sodium Hydroxide	Dark green	Pale green
3.	Powder + Acetic anhydride	Dark green	Pale green
4.	Powder + 0.1N Hydrochloric acid	Pale green	Dark green
5.	Powder + water	Pale green	Dark green

**Table 4. Study of Plant cell inclusions of *Aristolochia bracteolata***

S.No	Test	Result	Colour
1.	Cellulose	+	Pale yellow
2.	Lignin	+	Deep blue
3.	Suberin	+	Deep yellow
4.	Chitin	+	Violet
5.	Starch	+	Blue
6.	Mucilage	+	Pink
7.	Proteins	+	Brick red

8.	Alkaloids	+	Reddish brown
9.	Tannins	+	Bluish black
10.	Calcium oxalate	+	Needle shaped crystals
11.	Calcium carbonate	+	Needle shaped crystals

**Table 5. General Chemical and Micro chemical tests for Leaf powder of *Aristolochia bracteolate***

S.No	Test	Results
1.	Test with water /aqueous extract	+
2.	Test For Tannins	+
3.	Test for Anthra quinine	-
4.	Test for Mucilage	+
5.	Test for Carbohydrate	+
6.	Test for alkaloids	+

**Table 6. Leaf constants of *Aristolochia bracteolate***

S.No	Parameters	Results
1.	Vein islets number	90±7.61
2.	Vein termination number	99 ± 4.81
3.	Stomatal number	21 ±0.55
4.	Stomatal index	24 ±0.97

## DISCUSSIONS

The plant was screened for its Macroscopic, Microscopic, Physiochemical parameter, Florescence analysis, General and microchemical analysis for crude powder and Plant cell inclusions showed that they all within limit. Extraction was carried out by using soxhlet apparatus. The extractive values are determined by using the chemicals in order of polarity wise. The extractive value was highest in water and was recorded to be 24.0% w/w, and ethanol soluble extractive value was about 14.4 % w/w. The lowest value non polar solvent pet ether 2.4% w/w, and hexane like 8% w/w. The different ash values like total ash 5% w/w, Acid insoluble ash 2% w/w, and sulphated ash 12% ww/w. The *Aristolochia bracteolate* leaf powder reported the potential fluorescent property with different chemical reagents. Mucilage, alkaloids, and tannins identified the general chemical and micro chemical analysis. Ethanolic extract was made by using soxhlet apparatus; finally get the ethanolic extract

was tested with chemical reagents colour reaction based. The presence showed the alkaloids, flavonoids, carbohydrates, phenolic compounds, saponins and tannins.

## CONCLUSION

The plant *Aristolochia bracteolate* Lam., was screened for its Macroscopic, Microscopic, Physiochemical parameter, Florescence analysis, General and microchemical analysis for crude powder and Plant cell inclusions. Extraction was carried out by using soxhlet apparatus. The presence showed the alkaloids, flavonoids, carbohydrates, phenolic compounds, saponins and tannins. Developing countries like India having the percentage of poor people more, to meet with the demand of the poor public, the *Aristolochia bracteolate* Lam., may serve the purpose once the evaluation and detailed studies may over. This work is valuable for further continue the research doing persons.

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