



## International Journal of Innovative Pharmaceutical Research

Journal homepage: [www.ijipr.com](http://www.ijipr.com)

### Pharmacognostic Evaluation of *Aristolochia Bracteata*

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#### ABSTRACT

*Aristolochia bracteata* is an important drug mentioned in the traditional medicinal texts. Recent pharmacological findings indicate it possesses significant anthelmintic, anti-oxidant, wound healing, cytotoxic, abortifacient and emmenagogue activity. However, no conclusive pharmacognostic study of these leaves has been performed yet. The present work deals with the qualitative and quantitative pharmacognostic evaluation of *Aristolochia bracteata*. The important diagnostic features include anomocytic stomata, xylem vessels with reticulate thickening, horseshoe shape xylem vessels, acicular calcium oxalate crystal and curved covering trichomes. This study would help in establishing its quality parameters and standardizing its formulations.

**Keywords:** *Aristolochia bracteata*, Wound healing, Insecticidal, Pharmacognosy.

#### INTRODUCTION

*Aristolochia bracteata* (Family - Aristolochiaceae) is also known as (English) Worm killer, Bracteated Birthwort, (Hindi) Gandan, Kidamari, (Sanskrit) Dhumapatra, Gridhrani, Kitakaha, Kitari, (Gujarati) Kidamaari (Kirtikar KR *et al.*, 2005, Khare CP, 2007). Its leaves are traditionally used in vata, kapha and painful joints, applied to sores to kill maggots, useful as insecticide, wound healer, anthelmintic, anti-oxidant, cytotoxic, abortifacient and emmenagogue (Anonymous, 1956, Kalpanadevi B, 2011, Kavitha D *et al.*, 2009). The present investigation deals with its qualitative and quantitative microscopic evaluation, thereby establishing its quality parameters.

#### MATERIALS AND METHODS

##### Collection and herbarium preparation

*A. bracteata* was collected from the herbal garden of RK College of Pharmacy, Rajkot, Gujarat, in June, 2011. Herbarium and voucher samples were prepared and deposited in Department of Pharmacognosy, RK College of Pharmacy, Rajkot (Voucher no. RKCP/COG/19/2011).

##### Pharmacognostic studies

Morphology of fresh leaves of *A.bracteata* was studied. Photomicrography of stained and unstained

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transverse sections of fresh leaves was performed. Leaf constants were established using camera lucida. The leaves were dried under shade, powdered to 60#, stored in airtight containers and used for powder study and quantitative microscopy (Table 1) (Khandelwal KR *et al.*, 1996).

#### RESULTS AND DISCUSSION

##### Macroscopy

The leaves are 3.8-7.5cm in length and as broad as long. The upper surface is dark green while lower surface is light green in color. It is a simple leaf containing reticulate venation and papery texture. It has entire margin with obtuse apex, cordate at base with wide shallow sinus. The shape of leaf is reniform or broadly ovate and base is symmetrical. The lamina surface is glabrous. It has short petiole about 1.3 -3.2cm long and stipules are absent. The arrangement of leaves is sub-opposite and they have bitter taste (Figure.1).

##### Microscopy

##### Surface preparation

Epidermal cells are straight walled; having anomocytic stomata and unicellular curved shape covering trichomes (Figure.2).

##### Transverse section

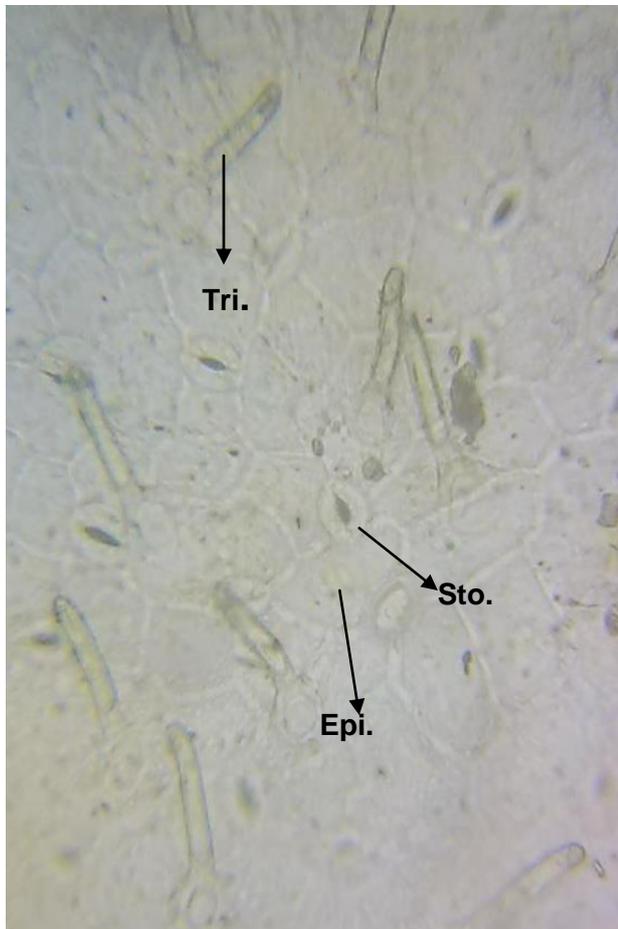
Lamina of transverse section shows an upper epidermis covered by thin cuticle. Unicellular curved shape covering trichome present on both the epidermis. Underlying the upper epidermis is a bi-layered, compact,

radially elongated palisade followed by spongy mesophyll composed of 2-3 layers of loosely arranged parenchymatous cells. Midrib consists of well-developed collenchyma beneath the epidermis. Vascular bundles are bicollateral. Ground tissue consists of loosely arranged polygonal parenchymatous cells (Figure.3, 4 and 5).

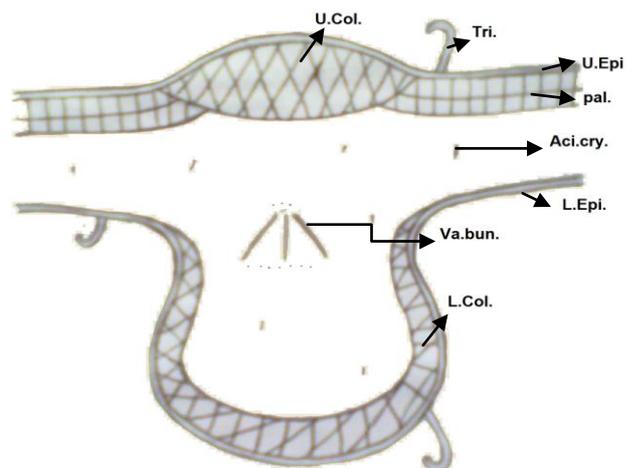
**Figure.1 Leaf of *A. bracteata***



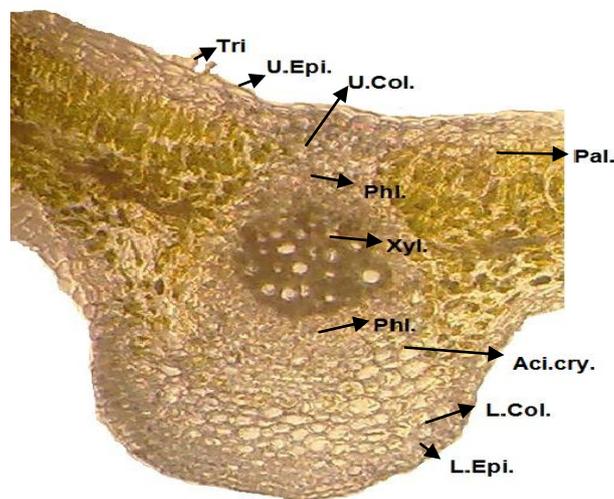
**Figure.2 Surface preparation**



**Figure.3 Schematic TS of leaf**



**Figure.4 Detailed TS of leaf**



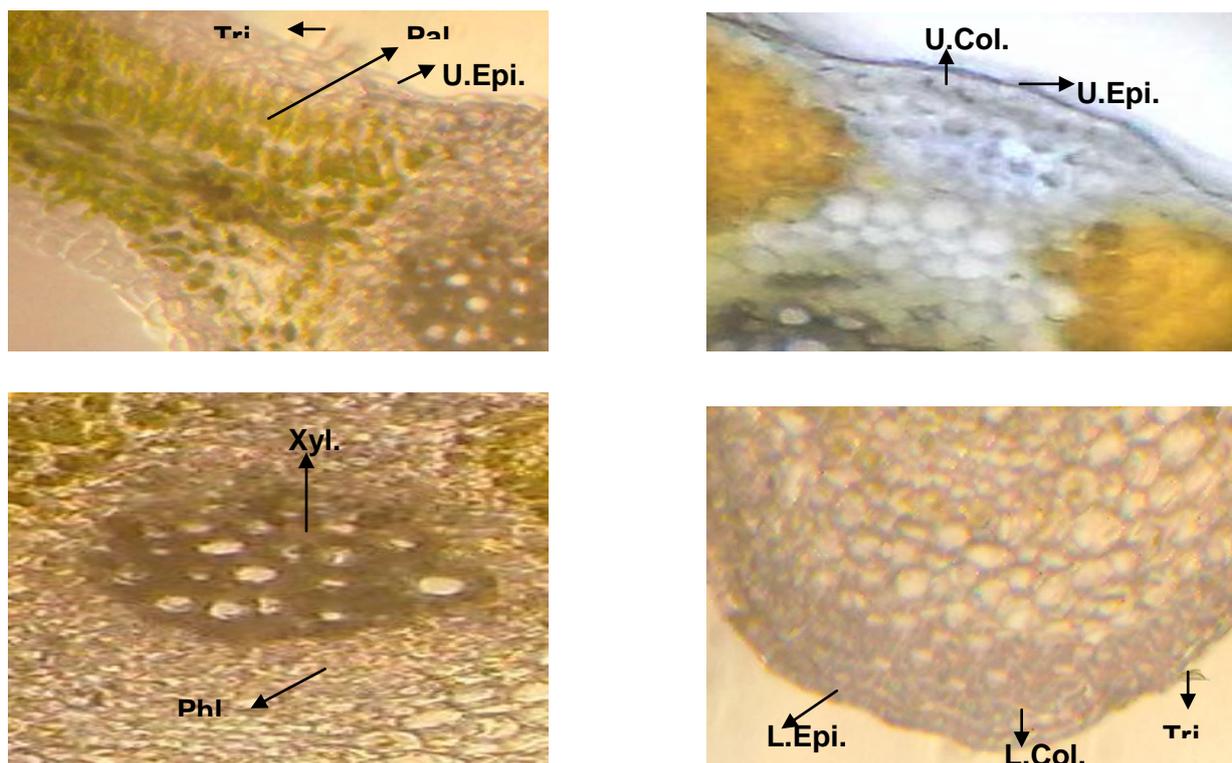
**Powder characteristics**

It is a dark green powder with no distinct odor or taste. The important diagnostic features of the powder include parts of epidermis in surface view showing straight walled epidermal cells and anomocytic stomata, xylem vessels with reticulate thickening, acicular calcium oxalate crystals, and sickle-shaped covering trichomes (Figure.6).

**Table 1. Quantitative microscopy**

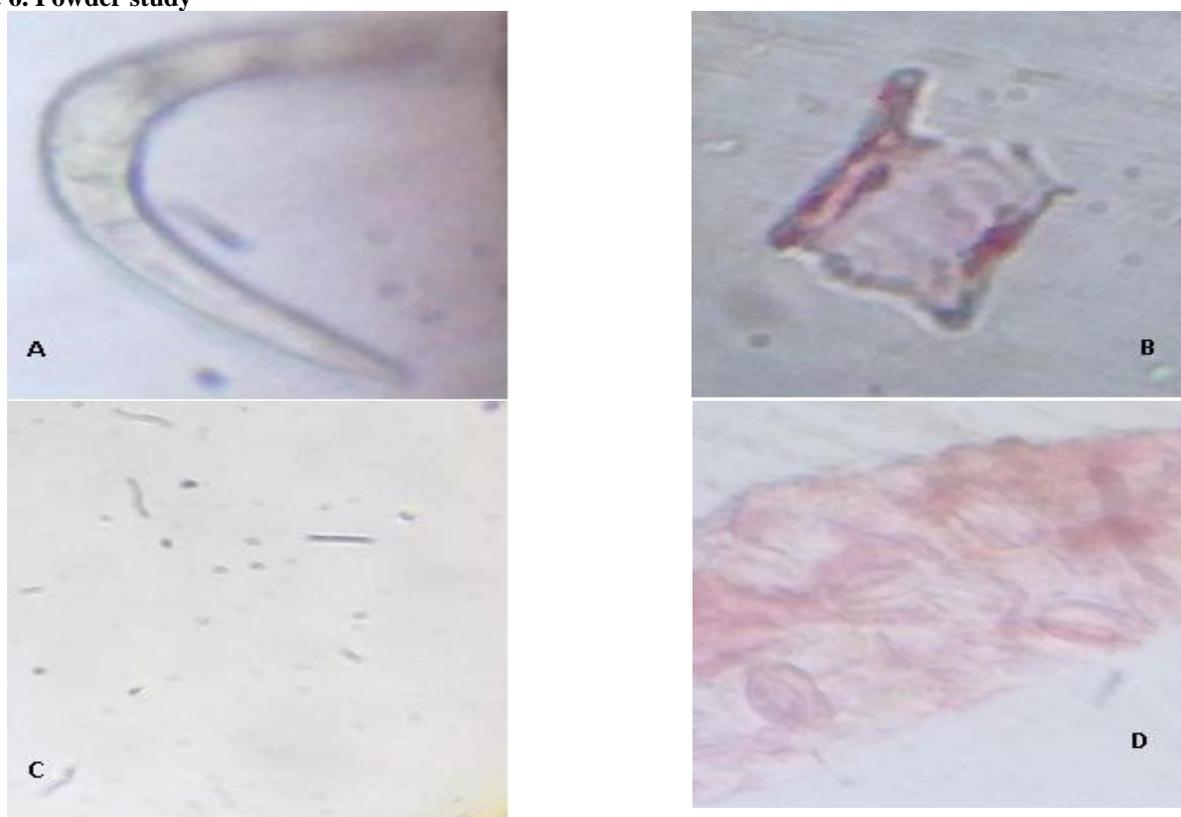
Leaf constant	Mean value ± SD
Stomatal number	
Upper surface	14±1
Lower surface	27±1
Stomatal Index	
Upper surface	23.72±0.5
Lower surface	40.5±0.5
Veinislet number	13±1
Veintermination number	10±1

**Figure.5 Enlarged portions of detailed TS**



(U.Col., Upper Collenchymas; U.Epi, Upper Epidermis; L.Col., Lower Collenchymas; L.Epi., Lower Epidermis; Pal., Palisade; Xyl., Xylem; Phl., Phloem; Tri., Trichomes; Aci.Cry., Acicular Crystals of calcium oxalate; Va.bun. , vascular bundle)

**Figure 6. Powder study**



(A: Sickle-shaped covering trichomes, B: Reticulately thickened xylem vessels, C: Acicular crystals, D: Anomocytic stomata)

## DISCUSSION

The present work deals with the qualitative and quantitative microscopical evaluation of *Aristolochia bracteata*. Diagnostic characters of powder include sickle-shaped covering trichomes, anomocytic stomata, xylem vessels with reticulate thickening and acicular

calcium oxalate crystals. Various leaf constants were established which can be important in detecting adulteration and mishandling of the crude drug. Development of such a monograph would help in identification of *Aristolochia bracteata* and standardization of its formulations.

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