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Research Article

**COMPARATIVE PHARMACOGNOSTIC EVALUATION OF  
LEAVES AND STEM BARK OF *Bridelia airy-shawii***

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**Abstract:**

*Bridelia is a genus distributed among tropical and subtropical regions of the world, mainly in Africa and Asia. Around 60 species of Bridelia (Euphorbiaceae) are found in nature but chemical, pharmacognostic and pharmacological investigation of only 16 species is done extensively. Bridelia species and their preparations found medical application in cardiovascular, gynecological, anti-inflammatory, anti-diabetic, anti-nociceptive and sexual diseases. Toxicity of the remedies or the isolated compounds from Bridelia plants is not published. Ethno-biological findings suggest Bridelia airy-shawii stem bark and leaves are possessing greater potential to cure inflammatory disorders specially arthritis which is substantially incurable by conventional medicinal system. The study was undertaken with view to explore and compare pharmacological potential of leaves and stem bark. Also choose more pronouncing part of plant for practical application. It is on track with milieu of Pharmacognostic findings as it can be correlated with major objective.*

**Key words:** *Bridelia airy-shawii, Pharmacognostic evaluation, anti-inflammatory, tannins, bark and leaves*

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## INTRODUCTION:

Population of world reached around 7.6 billion in May 2018(1). It is observation that large segment of population is distributed among rural region. This segment is lacking availability and access to medicinal system and services and hence it has to depend on alternative medicinal system particularly available in the form of herbal sources. On the other hand, most developed and privileged segment of population is worried about side effect and alarming drawbacks of conventional medicinal system in long run and trying to find health solutions in unconventional medicinal systems. It put a great amount of anticipation on other system available, it also lacerate the concept of medical pluralism using two or more medicinal system simultaneously for the synergistic, profound and side-effect free mitigation of disorders. Ethno-medicinal system and its quantum of information particularly from countries like India having protracted narration and amalgamation of many civilizations is reliable. However it's pitiful truth that many of such valuable information are becoming extinct and it won't be reproducible if major steps are not taken with radical approach. Bridelia is large genus distributed among the world, it is well studied and illustrated but yet much of the work is remaining and has to completed with enormous sense and responsibility. Bridelia airyshawii is one of the prospective sources of biomolecules capable of mitigating inflammatory, cardiac and gynecological disorders. The information available is concise and seems hesitant as it is not scientifically validated; nevertheless plant is utilized as timber by many inhabitants as they are unaware of miraculous health potential of plant. It is essential to secure the plant and enhance its optimum use for betterment of mankind rather than wasting it as kindling. It is common observation that leaves and stem bark of plant are preferred as medicinal moieties. Local people also use it orally as well as externally to get rid of inflammation and other related ailments. However details pharmacognostic account of plant is missing in literature, the work is taken to ensure valid pharmacognostic data for future work will be avail.

## MATERIAL AND METHODS:

**Collection, Authentication and Storage of plant material:** The fresh bark and leaves of Bridelia airyshawii were collected in the month of July (2012) from Ranipur (Toranmal) of Nandurbar District (MS), India. It was authenticated by Dr. D. A. Patil, Taxonomist, H.O.D. of Botany, Dr. P. R. Ghogrey College, Dhule (MS).

**Macroscopic study:** Macroscopic evaluation to ensure color, odor, size and shape was done as per methods described in Trease and Evans.

**Microscopic study:** Stem bark was soaked in water to make it soft and delicate, remarkably thin hand cut sections were taken from the fresh stem bark, permanent double stained as per the plant micro techniques method. Leaf was torn from middle section to take T.S. showing all layers, radial tissue arrangement and cellular diversity. Histochemical study was done as per basic protocol.

**Phytochemical evaluation:** Plant materials were dried under the shade it will avoid the decay of chemical moieties; it was further pulverized and stored in dry container for further use. Qualitative phytochemical analysis was determined for various primary and secondary metabolites. Ash value was estimated to establish carbon content as well as inorganic and other sort of impurities. Extractives values were attained with solvents of varied polarity to track solubility yield with certain chemical allocation.

## RESULTS AND DISCUSSION:

### Macroscopic study:

Bridelia airyshawii is minuscule or modest sized deciduous tree, spinous when young, it grows about 18 m in height fortified with strong conical spines 7 cm long.

Leaves are numerous, bright green and glabrous above slightly faint on the other side, turning pinkish brown before fading. It size between 7.5-15cm long, acute or acuminate, rigidly coriaceous, lanceolate or ovate-lanceolate.

Bark is grey or brown in color, exfoliating in irregular flakes.

Flowers are small, unisexual yellow in clusters on long terminal

Drupes are edible, purple-black, 1-2 seeded appearing globose fleshy

### Microscopic study:

Transverse section of bark shows brownish outer layer of cork, followed by secondary cortex, a separating layer of cambium, phloem and inner layer of pith. Whereas transverse section of leaf shows presence of upper epidermis, lower epidermis, collenchyma, xylem and phloem and stoma.

### Phytochemical evaluation

**Qualitative chemical analysis:** Both leaves and bark

depicts presence of primary metabolites like carbohydrates whereas absence of proteins or amino acids. Ample amount of secondary metabolites are present like tannins and steroids. Steroids seem to be more concentrated in leaves as compared to bark. Glycosides, saponins, flavanoids, alkaloids are also present to some extent. Both leaves and bark are

showing similar kind of chemical distribution. Chemical moieties are responsible for showing pharmacological potential from slackly similar pattern of distribution of these secondary metabolites it can be concluded both leaves and stem bark will possess similar sort of medicinal potential.

**Table no.1 Preliminary Pharmacognostic screening of leaves and stem bark of *Bridelia airyshawii***

Leaves			Extract	Bark		
Aqueous	Pet. ether	Methanol		Methanol	Pet. ether	Aqueous
-	-	-	Alkaloids	-	-	-
-	-	-	Amino acids	-	-	-
+	-	+	Carbohydrates	+	-	++
-	-	+	Flavonoids	+	-	-
-	-	++	Glycosides	-	-	-
+	-	++	Saponin glycoside	+	-	+
-	-	-	Proteins	-	-	-
-	++	++	Steroids and Triterpenoids	++	+	-
+	-	+++	Tannins (Phenolic comp.)	++++	-	++

Ash value was determined and it illustrates carbon content and allocation of inorganic chemical moieties in the plant parts. While acid insoluble ash neglects the inorganic sort of impurities and clears deviation in ash value and depicts more promising and accurate yield. It is essential part to be considered when herbal medicines are to be developed as formulation because they tend to contain heavy metals and other sort of impurities making them vulnerable.

**Table no.2 Ash value of leaves and stem bark of *Bridelia airyshawii***

	Ash value (Stem bark)	Ash value (leaves)
Total Ash	8.2%	7.4%
Acid Insoluble Ash	7.6%	6.2%

Extract value generates a greater understanding towards the polarity wise distribution of chemical moieties in different parts of plants. Pet. Ether mostly removes fatty and steroidal content from the plant and hence leaves found to contain more of Pet. Ether extract. Methanol is mid-polar solvent and extracts most of mid polar components and its yield is much greater suggesting ample amount of secondary metabolites like tannins, glycosides, saponins, flavanoids align with our findings from preliminary pharmacognostic qualitative evaluation. Aqueous extract is most important as many of the Ayurvedic and traditional formulations are simply decoctions of plant parts, it also prefers to take plant part as whole to enhance medicinal benefits. Chloroform is best choice solvent for alkaloids and high molecular weight moieties.

**Table no.3 Extract value of leaves and stem bark of *Bridelia airyshawii***

Extract	Bark Extractive value	Leaves extractive value
Methanol	13.10 %	12.45%
Petroleum ether	1.1 %	3.5%
Chloroform	03.62 %	1.15%
Aqueous	14.4 %	11.2%

### CONCLUSION:

Comparative Preliminary Pharmacognostic evaluation of leaves and stem bark of Plant suggest similar chemical moieties are distributed in leaves and stem bark. It makes clear that erosion stem bark maximizes the chance of death of plant as delicate inner wood is exposed to external environment on the other hand leaves can be taken in balanced manner without disturbing plant cycle. It also ensures the long term and regular supply of medicinal plant part hence it is advisable that leaves should be preferred

and promoted as medicinal moiety. A detailed comparative Pharmacological investigation of leaves and stem bark is essential to validate and confirm findings of this work.

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