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Review Article

An overview of *Bridelia Retusa Linn.*

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ABSTRACT

Bridelia retusa belonging to the family Euphorbiaceae commonly known as asan or aghan found up to the altitude of 1000 M except in very dry region. The plant *Bridelia retusa* present in warmer part of India and whole plant useful in traditional system of medicines to cure different type of diseases. The bark of plant is tribal people used in treatment of rheumatism, antiviral, in snake bite and to produce sterility. The leaves, bark, roots and fruit contain different type of phytochemicals belongs to classes steroids, tannins, phenols, flavonoids, and saponins. The leaves are containing isoflavone having antifungal and antibacterial activities support use of leaves in ayurveda to treatment of wound and urinary tract infections. Chitosan flavonoid is isolated from leaves which showed analgesic and anti-inflammatory activities. The present study reported traditional properties, phytochemical pharmacognostic properties such as analgesic, anti-inflammatory, anti-microbial, antioxidant, hypoglycemic and immunomodulatry activities of plant *Bridelia retusa*.

Key Words - Phytochemicals, Pharmacogonatic, Analgesic, *Bridelia retusa*.

INTRODUCTION

Plants plays vital role for the existence of life on the earth and use of plants as medicine is as old as humanity. Medicinal plants have been used for centuries as remedies for human diseases because they contain components of therapeutic value. The interest in the study of medicinal plants as a source of pharmacologically active compounds has increased worldwide. The Materia medica of India provides a great deal of information on folklore practices and traditional aspects of therapeutically important natural products. Indian traditional medicine is based on various systems including ayurveda, sindha, unani and homeopathy. The discovery of these drugs is primarily based on phytochemical, pharmacological and allied approaches including various instrumental techniques such as chromatography, spectroscopy and others. According to world health organization (W.H.O.) four billion people, which is near about 80% of the world population use herbal drugs for some aspects of preliminary health care. In ruler part of India medicinal plants are easily available and local tribal people have great information. In India due to diversity in climate and soil hence availability of large number of plant easily. These herbal drugs are safety, more potency, low in cost and no side effects. *Bridelia* genus worldwide 50 species distributed in Tropical Africa, Asia ranging from India and China, Australia and 10 species in Thailand (Alekya Kilarual et., 2011) hotter part of world.

Objective of the study: In the present review, we have carried out an- in depth literature survey on the plant *Bridelia retusa*, reports on phytochemicals and ethno-pharmacological application of plant.

Habit and Habitat

Bridelia retusa spreng. Syn. *Bridelia airy- shawii* from Family Euphorbiaceae (Sanskrit - Asan,

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Hindi - Khaja) is small to moderate size deciduous tree found throughout the warmer part of India except in very dry region up to the altitude 1000 M. Bark blackish – brown in color and irregularly fissured leaves 4.5-10x2.7-11.5 cm elliptic - oblong, sometimes ovate, obtuse or sub-acute entire, slightly crenulated tormentos beneath. Flowers are creamy – white in terminal panicles of erect and fruits are greenish when ripe purple in color. Flowering and fruiting in month of July - December.[1]

Morphological Character

Bark - The bark is externally blackish-brown, internally yellowish-brown, taste is astringent, odorless and rough to touch.

Leaves - Leaves 4.5-10x2.7-11.5 cm elliptic-oblong sometimes a ovate, obtuse or sub-acute entire.

Flowers - Flowers creamy-white in terminal panicles of erect or drooping spikes.

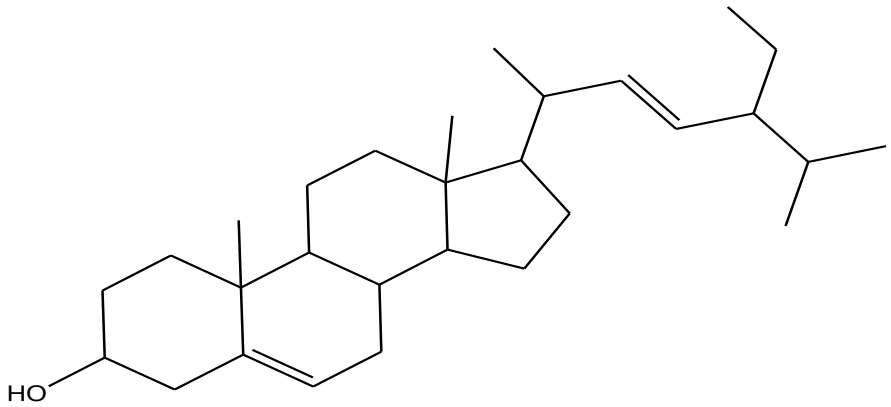
Fruits - Smooth on the enclosed perianth. Ripe fruits are wrinkled and greenish purple in colour.

Chemical Composition

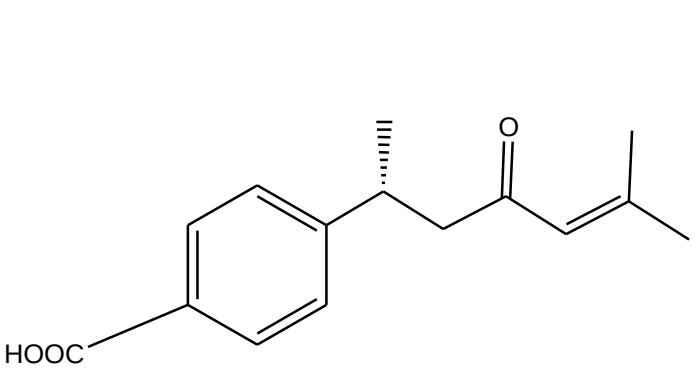
Bark -The variety of phytochemicals are reported in bark of plant *Bridelia retusa* which are biologically active belongs to different classes like steroids, triterpenoids, tannins, phenols, fats, and minerals. Minerals like Calcium, Copper, Iron, Manganese, Magnesium, Phosphorus and Zink are reported in plant. [2, 3] Triterpene Ketone [4 - desmethyl eupha 7, 24(28) - diene - 3 - one], stigmasterol **(1)** and dehydrositosterol was isolated and reported. A literature survey showed presence of Benzoic acid derivatives like 4-[R-6-methyl-4-oxohept - 5en - 2yl] benzoic acid **(2)**, (-) isochaminic acid (**3)**, (+) - sesamin **(4)**, 5-allyl - 1, 2, 3 trimethoxy benzene **(5)** and 4-[(R)-6-methyl - 4 - oxoheptan-2-yl] benzoic acid, gallic acid and ellagic acid are also isolated and having therapeutic value.[4]

Leaves - Isoflavone was isolated from leaves its structure characterized by IR and NMR spectroscopy which shows antibacterial activity. Chitosan flavonoids **(6)** are isolated from the leaves which exhibiting analgesic and anti-inflammatory properties.[5]

Fruits and Seeds - The chemical components found in fruit pulp and seeds are β-sitosterol **(7),** ellagic acid **(8)** and gallic acid **(9).**[6] This compounds showed antibacterial, antifungal activities. The ellagic acid and gallic acid exhibited antioxidant properties.



Stigmasterol
1



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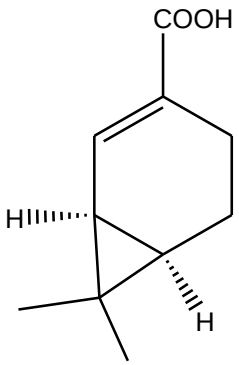

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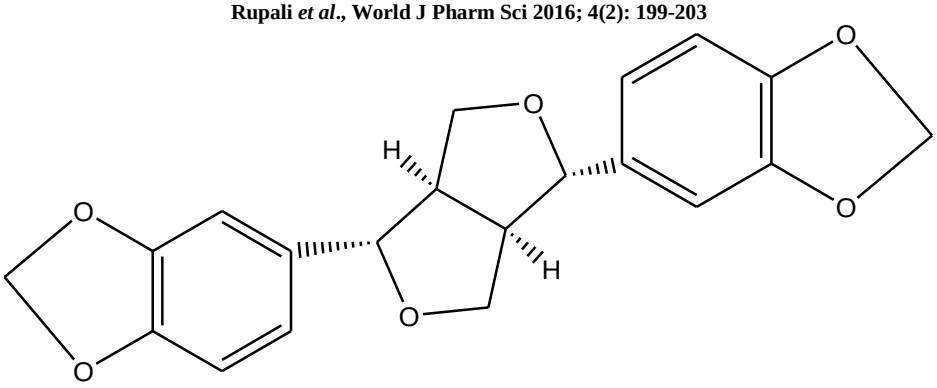

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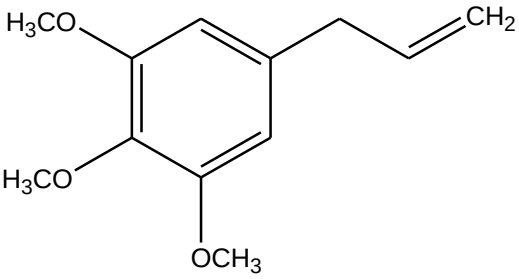

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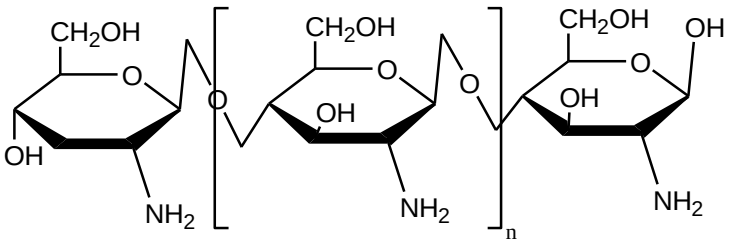
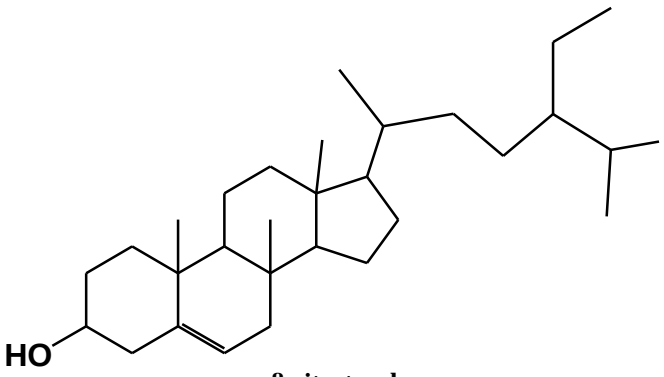
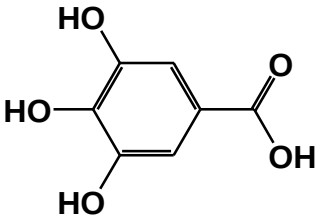


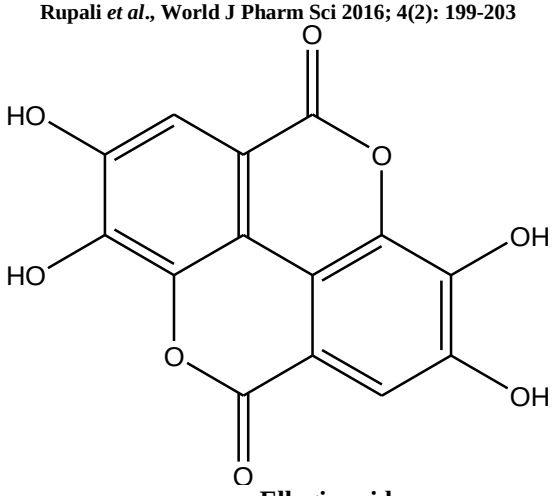
Chitosan
6



β-sitosterol
7



Gallic acid
8



Ellagic acid
9

Traditional uses: The plant is great important and native people of southern India use of bark for treatment of rheumatism and astringent agent (Jayasinghe et al., 2003). An ethno medicinal survey revealed that bark is given orally to women to develop sterility, as contraceptive, useful in 'vata' lumbago, hemiplegia. (Jain et al 2004). In herbal medicine for treatment of dysentery and diarrhea the bark is used. Bark of *Bridella retusa* also exhibited antiviral, hypoglycemic and hypotensive properties. The paste of *Bridelia retusa* leaves and leaves of *Curculigo orchioides*, oil of castor, coconut applied externally to cure wounds (Ayyonar and Ignacimuthu 2005). Leaves also cure urinary tracts infection (Jain et al 2004). *Bridelia retusa* leaves are used as fodder and said to free intestinal worms of cattle. In traditional system of medicines as antibacterial.[7] Root of plant is purgative, astringent and remedy for gonorrhea. One or two drops of fruit extract poured in ear to cure earache and ripen fruits are eaten.[8] The plant also used in traditional system of medicine to cure dysentery and diarrhea.[9, 10] Bark juice taken internally in case of snake bite.[5]

Table showing Phytochemicals present in different plant part

Plant part	Phytochemical isolated	Ethno medicinal uses
Bark	Triterpene ketone, benzoic acid derivatives, ellagic acid, sitosterol and dehydrositosterol.	Make sterility in women, as contraceptives, treatment of rheumatism, hypoglycemic and anti-viral. Antidote for snake bite
Leaves	Isoflavone and chitosan flavonoids.	Treatment of wound, urinary tract infection, dysentery and diarrhea.
Fruit and seeds	β-Sitosterol, ellagic acid and gallic acid	Cure earache,
Roots	-	Remedy for gonorrhea, astringent and purgative.

Pharmacological properties

Analgesic and Anti-Inflammatory: Ethanol Extract of leaves *Bridelia retusa* showed Chitosan flavonoid. Chitosan flavonoid screened for anti-inflammatory and analgesic activity in experimental animal models. The anti-inflammatory activity was determined by formalin tail flick method and hot plate latency method by using external standard indomethacin and chitosan. Chitosan significantly exhibited anti-inflammatory and analgesic activity at a dose 250 mg/ Kg.[5]. Bark of plant *Bridelia retusa* extracted in petroleum ether, chloroform, methanol and water by soxhlet extractor. The literature study revealed that petroleum ether extract in the acute inflammation model was carrageenan- induced rat paw edema and chronic model showed potent anti-inflammatory activity. [5, 11]

Anti-microbial activity: The acetone and ethanol extracts of bark *Bridelia retusa* were active against Gram negative strains *Klebsiella pneumoniae, Pseudomonas aeruginosa* and *Proteus vulgaris*. Acetone and ethanol extracts shows activity against fugal strain *Candida albicans*.[12] The methanolic and ethanolic extracts of leaves *Bridelia retusa* active against *E. coli, Staphylococcus aureus, Pseudomonas aeruginosa* and *S. typhimurium*. At conc. 15 mg/ml.[13, 14]

Hypoglycemic activity: *Bridelia retusa* bark extract studied for hypoglycemic activity. Methanol extract fractionated in petroleum ether and n-butanol *Bridelia retusa* did not show any

hypoglycemic effect in normal glycemic rats on fasting condition on other hand, the hypoglycemic effect of the extracts in the glucose fed rat by an intestinal glucose absorption and the stimulation of the glucagon like peptide. The literature survey revealed that *Bridelia retusa* extracts produced hypoglycemic effect due to polysterols and triterpenoids.[15]

Anti-oxidant Activity: *Bridelia retusa* bark extracted in acetone: water (70:30) to get tannins rich fraction of bark. Tannin rich fraction has strong antioxidant activity by inhibiting DPPH, ALP reducing power, hydroxyl radical and hydrogen peroxide and nitric oxide scavenging when compared with standard.[11,12, 17-18]

Immunomodulatry Activity: *Bridelia retusa* leaves extracted in methanol. Methanol extract contain precence of alkaloids, glycosides flavonoids, tannins, phenolic substances and saponin. *Bridelia retusa* significantly potentiated the cellular immunity by facilitating the foot pad thickness responses to the sheep RBC's in sensitized rats. The study stated that *Bridelia retusa* shows a significant stimulation of the cell mediated immunity and no effect on normal immunity.[16]

CONCLUSION

The above literature finding the tannins rich fraction showed anti-inflammatory and antioxidant activities. Presence of sterol and triterpenoids responsible for anti-inflammatory activity support the use of bark in traditional system of herbal medicine in rheumatism. The bark of plant also exhibited antimicrobial, hypoglycemic and immunomodulatory activities. The plant *Bridelia retusa* leaves and bark extracts exhibit antibacterial and antifungal activities support the leaves used in herbal medicine in treatment of wound and urinary tract infections. In study ethanolic extract of leaves showed presence of chitosan having analgesic and anti-inflammatory activities. The leaves also exhibit immunomodulatory activity. The present study showed that pharmacological and phytochemical properties of various bioactive compounds present in the *Bridelia retusa*. Further investigation conducted to isolate and characterize the phytoconstituents from various leaves extracts.

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