Anogeissus latifolia: A Recent Update on its Chemistry and Pharmacological Application

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Summary

The present study was undertaken to review current pharmacological activity and chemistry of *Anogeissus latifolia*. This plant contains a great content of terpenoids and flavanoids which make this a plant with high antioxidant potential. This plant has been evaluated for different pharmacological activity like antimicrobial, anti-ulcer, wound healing and anthelmintic activity. This plant also produces one gum exudate which is commonly known as ghatti gum, and extensively used as polymer in drug development process. Recently this gum has been proved with anti-hyperlipidemic activity.

KEY WORDS: *Anogeissus latifolia*, Dhava, Pharmacological activity, Chemistry.

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Introduction

Anogeissus latifolia (AL) is a medium to large sized tree of Family Combretaceae distributed throughout India, Myanmar, Nepal and Sri Lanka. In India it is mainly found in dry deciduous forest and in the sub Himalayan region and hills of South India up to 1350 meter. The plant has been already used in the Ayurveda system of medicine. The pharmacognostic and phytochemical parameters of the plant has been well established for proper identification and authentification (1). In the ancient literature ethno-botanical importance of its bark has been reported to be used in the treatment of various skin diseases such as sores, boils and itching (2), snake and scorpion bites, stomach diseases (3), colic (4), cough (5) and diarrhoea (6) though till date no pharmacological report on the plant or its extract has been published.

Fig.1. Plant of *Anogeissus latifolia*

Chemistry of *Anogeissus latifolia*

AL contains a wide variety of chemical compounds, which is shown by research papers published recently. This plant contains different type of triterpenoids like 3-β-hydroxy-28-acetyltaraxaren and β-sitosterol reported by Rahman *et al* (7). The bark was first examined by Reddy *et al* (8), who isolated (+)-leucocyanidin. Later, ellagic acids and two new glycosides of ellagic and flavellagic acids were reported (9). Leaf of this plant is rich in gallotannins reported by Reddy *et al* (10). Recently Govindarajan *et al* isolated compounds responsible for antioxidant activity through activity guided isolation technique.

Pharmacological Application

From the ancient times bark and leaves of AL has been extensively utilized in the treatment of different diseases, but not too much literature and proved research known for its authentification and establishment as potent herbal drug. This review is an attempt to collect all the pharmacological activity data for its subsequent establishment as a potent medicinal herb.

Antioxidant and Hepatoprotective activity

Govindarajan *et al* have studied the antioxidant potential of AL plant extracts and found that it contains good to moderate antioxidant potential (11). Pradeep *et al* studied hepatoprotective activity of hydro-alcoholic extract of AL and evaluated its activity both *in vitro* and *in vivo*. The presence of polyphenols and flavonoids supports its antioxidant potential (12). The drug also contains gallic acid. The high percentage of quercetin, rutin and gallic acid in the extract justifies the potent antioxidant activity which results in the hepatoprotective potential of the extract. Quercetin and rutin are reported to be potential therapeutic agents as they reduce oxidative DNA damage, lipid peroxidation and quench free radicals (13).

Antiulcer and antimicrobial activity

The AL bark has been studied for its potentials utilization as antiulcer drug. The hydroalcoholic extract of AL showed potential gastro protective activity, the possible mechanism is due to decreased LPO and SOD with concomitant increase in catalase activity (14). The moderate antimicrobial and antifungal activity shown by leaf extracts and also by volatile oil due to presence of gallic acid, ellagic acid and its derivative in good quantity.

Wound healing activity

Govidarajan *et al* studied wound healing potential of AL extracts and observed there was a decrease in the epithelization period, along with a visibly decreased scar area which justifies the use of *A. latifolia* in Indian traditional systems of medicine for various skin diseases, such as sores, boils and itching (15).

Anthelmintic activity

Various extracts of bark and leaf of AL have been evaluated for anthelmintiic activity against earthworm model. All the extracts moderate to significant anthelmenthic activity. Out of all, chloroform extract of bark and pet ether extract of leaf showed potent anthelmenthic activity (16).

Gum exudates

The AL plant produces a good amount of gum popularly known as Ghatti gum. The gum is gray to reddish gray in color. This gum mainly consists of calcium salts of high molecular weight polysaccharides which on hydrolysis yields arabinose, galactose, mannose, xylose and glucuronic acid. The physicochemical study of this gum showed high viscosity which solely depends upon pH of the medium [17]. Kaur *et al* studied the rheological and structural characteristic of the gum and found that the molecular weight of is approximately $8.94X10^7$ g/mol. The gummy solution at low concentration exhibits pseudoplastic, time dependant shear thickening behavior (18). Ghatti gum has been extensively evaluated as sustained release polymer due to its high gelling property (19). Parvathi *et al* recently studied hypolipidemic activity of this gum (20).

Conclusion

Seeing the wide medicinal value of this plant, there is a need of standardization and authentification for future use. There is an urge of extensive clinical and toxicity study of different parts of plant extracts for correct use in ailments of different incurable disease.

The gum obtained from this plant has also potential to be used as pharmaceutical polymer in novel drug delivery system and also in food industry in preparation of different products.

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