Ethno-pharmacological Review of a Herbal Drug: *Anogeissus latifolia*

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Abstract

Anogeissus latifolia one of the important medicinal plant as since Ayurveda in cardiac disorder. The plant is useful in UTI infections, skin diseases, liver complaints, fever, epileptic fits etc. The plant is rich in pharmacologically active phenolic phytoconstituent-ellagic acid. It posses healing potential, microbicidal activities, antiulcer potential, hypolipidemic activities and hepatoprotective potential. Present review summaries ethnobotanical, phytochemical, pharmacological and biotechnological studies in this medicinal plant.

Key Words: *Anogeissus latifolia,* UTI infections, phytoconstituent, healing potential, hypolipidemic activities, hepatoprotective potential.

Introduction

Millions of the people in the third world still use the herbal drugs [1]. It has been estimated by WHO that 80% of the people living in the developing countries rely upon the traditional health practices for their primary health care needs [2]. However, the potential of higher plants as sources for new drugs is still largely unexplored. Many higher plants are known to be the main source of the drug therapy in traditional system of medicines [3]. In India, around 20,000 medicinal plants have been recorded. *Anogeissus latifolia* is also one of the plant in human health management. The present review reveals the medicinal profile of this important plant.

Botany

Anogeissus latifolia (DC.) is medium sized deciduous tree belonging to the family combretaceae and it is commonly known as gahtti. It attains height of about 30-40 feet [4]. Leaves are opposite or sub-opposite. Bark is smooth with grey- white colour and exfoliating in irregular thin scales [5]. Flowers sessile, in dense heads. Fruit small, compressed, winged with beak, seed ovoid. Tree flowers and fruits in the month of Sept-March [6]

Distribution

It is distributed throughout India [5] and Ceylon [7]. The plant is common in dry deciduous forest, except E. Bengal and Assam. It is found in Sub-Himalayan tract, from the Ravi to Nepal, Bhihar, Chota Nagpur and ascends to south India [8].

Ethnobotany

It is important timber and the leave and bark are used for tanning. The bark is effective in anemic conditions and urinary discharges, piles [7]. Stem bark is astringent, haemostatic, constipating, depurative and useful in vitiated conditions of *kapha* and *vata* [5]. According to Jain [9] stem bark is useful in diarrhea, dysuria, cough, colic, liver complaints, snakebite and skin diseases. Tribals in Udaipur district of Rajasthan, use the bark of this tree in the treatment of fever [10]. Bark is remedy for chronic cough called 'Dangya Khokala' [11].Tribal people residing in the forest of Gundlabranhmeswaram wild life sanctuary apply paste of stem bark on scorpion sting [12]. Decoction of bark, two spoons daily is useful as remedy against cough and leaf decoction is effective in epileptic fits [13]. Gum is used as tonic and generally consumed after delivery [13]. According to Jagtap *et al*. [14] pawara tribes of Satpura hills, use the gum with a cup of water or milk during early morning for lactation. Leaf juice is given in purulent discharges from the ear while, fruit is astringent to bowels and cures kapha and biliousness [7].

Phytochemistery

Reddy *et al.* [15] reported tannin, (+) leucocyanidin and ellagic acid from the bark, sapwood and heart wood, whereas, Deshapande *et al.* [16] isolated 3,3'-di-O-methyle ellagic acid-4'-β-D-Xyloside and 3,4,3'-tri-O-methylflavellagic acid-4'-β-D-glucoside from stem bark. Steroid, β-sistosterol and a triterpenoid, 3-β-hydroxy-28-acetytaraxaren were isolated from the ethyl acetate fractions of stem bark of *A. latifolia* [17].

Pharmacology

Govindrajan *et al.* [18] evaluated the wound healing potential of ethanolic extract of *Anogeisus latifolia* bark for treatment of dermal wounds in rats. They administrated ethanolic extract orally and found decreased epithelization period along with decrease in scar area. They noticed that tensile strength and hydroxyproline contents were significantly increased than nitrofurazone receiving rat, indicating its wound contraction ability. The ethanolic extract was also found inhibitory against human pathogenic bacteria *Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumonae* and *Escherisia coli* due to the presence of ellagic acid [19]. Govindrajan *et al.* [19] studied the antiulcer potential of *Anogeissus latifolia* against aspirin induced, cold resistance stress induced, pylorus ligated and ethanol induced ulcers. They observed that 50% ethanolic extract (200mg/Kg body weight) inhibited the ulcer formation induced by cold resistant stress and also reduced the lipid peroxidation and activity of superoxide dismutase along with increase in catalase activity in cold resistant stress induced ulcers. Parvathi *et al.* [20] studied the hypolipidemic potential of *Anogeissus latifolia* in albino rats with respect to serum lipid levels. They noticed that treatment with gum ghaati significantly reduced the total cholesterol and triglyceride level at 500 mg and 750mg/kg of body weight in hyperlipidemic induced rats and dose of 750mg/kg of body weight also increased the high density lipoprotein cholesterol. Hepatoprotective activity of *Anogeissus latifolia* against carbon tetrachloride induced hepatotoxicity in albino rats of wistar strain was evaluated by Hulikere *et al.* [21].They [21] reported that CCl_4 (0.1mol/L) treatment depleted the viability of hepatocytes by 65%. *Anogeissus latifolia* treated hepatocytes showed concentration dependent protective effect and restored the viability of the hepatocytes. They further noticed that the effect was maximum at 1000µg/ml of *Anogeissus latifolia* extract while, *in vivo* hepatoprotective studies, CCl_4 treatment showed marked increase in the activities of the three enzymes, alanine aminotransferase, alkaline phosphatase and aspartate aminotransferase. They also reported that oral administration of *Anogeissus latifolia* at 300mg/kg reduced the induced activities of the all the three enzymes as compared to CCl_4 treated rats. They observed that *A. latifolia* at a dose 300mg/Kg of body weight, showed significant decrease in lipid peroxidation while, extract of *Anogeissus latifolia* doses at 100 and 300mg/Kg of body weight minimised degeneration of hepatocytes affected by CCl_4 treatment. Antioxidant potential of 50% ethanolic extract of *A. latifolia* was evaluated by Govindrajan *et al.* [23] and reported dose dependent inhibition of nitric oxide, DPPH radical, hydrogen peroxide, superoxide radicals.

Biotechnology

Shekhawat *et al*. [23] studied the micropropagation of *Anogeissus latifolia* using cotyledonary node and epicotyl explants from one month old seedlings germinated on half strength MS medium supplemented with 2% sucrose. They have inoculated cotyledonary segments on MS medium containing additives, 25mg/L each of adenine sulphate, arginine, ascorbic acid, citric acid and 1mM aspargine and 0.5mg/L BAP and noticed to produce 4-5 shoots than epicotyl explants producing 2 shoots only. With increasing concentration, number of shoots per plant also increased and at 1mg/L BAP, seven shoots were emerged while epicotyl produced only 3. They observed that MS medium containing additives (adenine sulphate, arginine, ascorbic acid, citric acid and 1mM aspargine) and 1.5mg/LBAP + 0.1mg/L IAA produced 9-10 shoots from cotyledonary node. Addition of 86mg/L (200µM) Fe-EDTA salt to this medium produced the maximum number of shoots per explant and higher concentration 300µM was found inhibitory to shoot induction [23].

Bhatt [24] improved the gum tapping method by ethephon treatment in trunk by injecting a syringe into holes made by increment borer. Gummosis is enhanced by ethephon application and 466 fold increases in gum yield was recorded in plants treated with 1600mg of active ethephon substance during April- May when plants becomes leafless. The ethephon application leads to 'schizo-lysigenous' formation of gum cavities in the axial parenchyma of sapwood and these results in the clogging of vessels of secondary xylem with gummy material.

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