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A Recent update on Phytochemistry, Pharmacology and Medicinal value of Axle wood (*Anogeissus latifolia* Wall. Cat)

Rashmi Yadav^{1*}, Sadhana Singh², Sanjeev Kumar³, K.N.Dwivedi⁴

¹⁻⁴Department of Dravyaguna, I.M.S., B.H.U., Varanasi, UP, India

ABSTRACT

Anogeissus latifolia Wall is one of the important medicinal plants in Ayurveda for Diabetes. It is also useful in UTI infections, skin diseases, liver complaints, fever, epileptic fits etc. The plant is rich in pharmacologically active phenolic phytoconstituents like ellagic acid. The tree has been studied for antioxidant activity. It possesses healing potential, microbicidal activities, anti-ulcer potential, hypolipidemic activities and hepatoprotective potential. The present review summarizes the Ayurveda perspective, ethno botanical, phytochemical, pharmacological studies of 'Dhava' in recent era.

KEYWORDS

Diabetes, Hypolipidemic activities, Healing potential, Phytoconstituents



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INTRODUCTION

Anogeissus latifolia (Dhava) belonging to Combretaceae family in classical texts, Nighantus and its use in recent era. It is an erect tree sometimes reaching 18-21 m; bark smooth, light coloured; young part glabrous or silky - pubescent. Leaves 6.3-10 by 3.5 cm, alternate and sub opposite, elliptic or oblong – elliptic, obtuse or very often shortly cuspidate. Root is pungent, acrid, sweet, cooling ;improves both taste and appetite, removes kapha and vata useful in anemias, urinary discharges, piles applied in skin diseases and erysipelas –The juice of the leaves is given in purulent discharges from the ear . Bark is bitter, astringent to the bowels useful in liver complaints, chronic diarrhoea, ophthalmic and eyesores, Susruta recommends the plant as useful in the treatment of snake bite and scorpion –sting¹.

MATERIALS

Dhava (*Anogeissus latifolia*) in Brahtraya-

Charak Samhita- (1000 BC)-

Charak samhita could be considered as the oldest one among the existing old medical treatises of India. This samhita is mainly concerned with Indian system of medicine. The drug *dhava* has been widely and frequently described in samhita period. Charak described it by the names of. Its many preparations used in *Prameha, vata, pitta, kapha roga, jvar, daha, Kustha roga, Raktarsh, Visarpa, Mutrakrichha, Yonivyapad chikitsa, Yoni prakshalan*. It is a plant of jangala desh as referred in Charak samhita. It is also used in treatment of *Kilasa, Indralupta, Kitibha, Bhagandara, Arsha, Apachi, Pama*².

Table 1 Following table show uses of *Dhava* in Charak Samhita

S.N.	Formulation	Indication	Reference	Page No.
1.	32 sidhatam churna pradeha	Kustha, Kilasa, Indralupta, Kitibha, Bhagandar, Arsa ,Apachi, Pama .	Ch. Su.3/2	pp.56
2.	Basti (kasaya skandh)	In Vata, Pitta, kapha roga	Ch .Vi. 8/144	pp.792
3.	19 Baladi Rasayan (swarasa)	Rasayan	Ch.Chi.1-2/12	pp.27
4.	Chandanadi taila	Jvar ,daha	Ch.Chi.3/258	pp.157
5.	Lepa	Vata –kaphaj kustha	Ch.Chi.7/125	pp.268
6.	Kwath for pana and avagahan	Kustha roga	Ch.Chi.7/129	pp.268
7.	Kwath for parisheka	Raktarsh	Ch.Chi.14/214	pp.445
8.	Khadiradi lepa	Visarp	Ch.Chi.21/88	pp.604
9.	Jalapana	Mutrakrichha	Ch.Chi.26/57	pp.728
10.	Udumbaradi Taila	Yonivyapad Chikitsa	Ch.Chi.30/74	pp.851
11.	Kariradi Kwath	Yoni Prakshalan	Ch.Chi.30/82	pp.852



Sushruta Samhita-(1000 BC)-

This samhita is composed by Vrddha Susruta and concered with ‘Shalaya chikitsa’. Susruta also described the use of

dhava in visha chikitsa , revati pratishedha chikitsa ,karnagata roga, pittaja kustha ,sukadosha chikitsa ,dristigata roga pratishedha³.

Table 2 Following table show uses of *Dhava* in Susrut Samhita

12.	Churna	Raktaskandana	S.S.Su.14/36 pp.152 S.S.Su.16/14 pp.152 S.S.Su.36/27-28 pp.152	
13.	Varunadigana	Kaphamedaroga chikitsa	S.S.Su.38/11	pp.152
14.	Sursadigana	Pratisyaya, Aruchi, Svas ,Kasa, Vranashodhan	S.S.Su.38/19	pp.152
15.	Churna	Darunikarana, Avachurana	S.S.Chi.1/86	pp.265
16.		Vranaropana	S.S.Chi.2/64	pp.284
17.	Ghritpaka	Pittaja kustha	S.S.Chi.9/7	pp.360
18.	Lepa	Kaphaj vridhi, upadansha ,Slipada	S.S.Chi.21/10	pp.454
19.	Taila paka	Sukadosha chikitsa	S.S.Chi.21/10	pp.481
20.	Kwath	Vamana virechana vyapada chikitsa	S.S.Chi.34/17	pp.524
21.	Bhsma	Jalashodhana	S.S.K.3/9	PP.568
22.	Kshar	Visha chikitsa	S.S.K.6/3	pp.580
23.	Mahasugandhi Agada	Visha chikitsa	S.S.K.6/22	pp.581
24.	Dhavadi Agada	Kita visha chikitsa	S.S.K.8/51	pp.587
25.	Anjana	Dristigata roga pratishedha	S.U.17/96	pp.632
26.	Tailapaka	Karnagataroga pratishedha	S.U.21/47	pp.647
27.		Pratisyaya pratishedha chikitsa	S.U.24/29	pp.653
28.	Dhavadi Kvatha	Revati pratishedha chikitsa	S.U.31/5	pp.663

Astang Hridaya – (7th cent. AD)-

It is also one of the important text of ayurveda, written by vagabhatta mentioned use of dhava in various diseases. Its many

preparations used in different ailments like svitra, Kustha , Krimi , Pandu roga , Prameha, gulm, visarpa chikitsa , linganash, Nasa roga . It is also used as rasayan⁴.

30.	Asanadigana	Svitra, Kustha, Kaphajroga, Krimi, Pandu roga, Prameha ,medodosha	A.H. Su.15/19	PP.236
31.	Muskakadigana	Gulm	A.H.Su.15/32	pp.238
32.	Putapaka	Tarpana	A.H.Su.24/18	PP.309
33.	Kwath	Kaphaj Mutrakriccha	A.H.Chi.11/12	pp.673
34.	Kwath	Mutraghata chikitsa	A.H.Chi.12/7	pp.678
35.	Lepa	Visarpa chikitsa	A.H.Chi. 18/15	pp.709
36.	Lepa	Kustha chikitsa	A.H.Chi.19/86	pp.717
37.	Pindanjana	Linga nasa pratishedha	A.H.U.14/31	pp.726



38.	Srit sarpi pariseka	Nasa roga chikitsa	A.H.U.20/12	pp.744
39.	Rasayana	Rasayana vidhi	A.H.U.39/105	PP.930

Table 3 Following table show uses of Dhava in Astang Hridya

Nighantus-

The Nighantu literature is one of the important aspect in the study of Plants. Nighantu literature is actually like Kosha , containing synonym of dravya . The drugs mentioned in nighantus with properties , actions and their uses .In following table there is various nighntus are described .

Uses and properties of Dhava is given in various nighantus. *Dhava* is placed in various *varga* of different *nighantu*, as per its properties and uses.

Dhava is used in form of different preparations in various ailments. It is used in sita prameha ,arsha , pandu ,Agnimandhya , Atisara, Pravahika etc.

Table 4 Following table show uses of *Dhava* in different Nighantus

40.	Dhanvantri Nighantu	Sita prameha , Arsha , Pandu, Pitta vikara ,Kapha vikara ⁵ .	Amradi Varga	pp.522
41.	Kayedev Nighantu	Prameha,Pandu and Kapha-Pittasamak ⁶ .	Aushadhi Varga	pp.156
42.	Raj Nighantu	Agnimandhya, Aruchi ⁷ .	Prabhadradi Varga	pp.285
43.	Bhav Prakash Nighantu	Prameha, Arsha, Pandu, pitta and kapha roga, Atisar, Pravahika, Arsha, Raktapitta, Vishchikitsa ⁸ .	Vatadi Varga	pp.528
44.	Priya Nighantu	Kapha vikar, Pitta vikar, Prameha, Arsha ⁹ .	Sharadi Varga	pp.136
45.	Madan pal Nighantu	Sita prameha, Arsha, Pandu, Pitta- kapha vikar ¹⁰ .	Vatadi Varga	pp.137
46.	Nighantu Adarsha	Sita, Prameha, Arsha, Pandu, Pitta vikara, Kapha vikara , Agnimandhya ¹¹ .	Haritkyadi Varga	pp.568

Chemical constituents

- The seeds revealed the presence of 16.31 % of crude protein 23.0 % pentose and 2% water soluble mucilage (Kapoor et al., 1975).o
- The aqueous extract of the leaves yielded a glycoside (Rao and satri).The leaves contain
- Gallo tannin, chebulagic and trigallic acids, arabinose, rhamnase, fructose, glucose and galactose, alanine, glycine and phenylalanine (Reddy et al., 1964b).

- Gum used as pharmaceutical aid contain 6-o-(β -D-glucopyranosyluronic acid) -D-galactose, 2-o-(β -D-glucopyranosyluronic acid)-D-mannose and aldotriouronic acid.
- The stem bark also contained shikimic and quinic acids, glucose, fructose; alanine and phenylalanine, tannins, saponins.
- Sapwood contain quinic acid, glucose, phenylalanine, ellagic and trimethylellegic acids.



- Heartwood contain quercetin, myricetin and trimethylellegic acid; glucose and phenylalanine, Gallic acid ellegic acid.
- The root contain glycoside and flavone¹².

Phytochemistry –

Reddy et al.(15) reported tannin , (+) leucocyanidin and ellagic acid from the bark, sapwood and heartwood, whereas, Deshpande 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 -D-sistosterol and a triterpenoid , 3-hydroxy-28-acetytaraxaren were isolated from the ethyl acetate fractions of stem bark of A. latifolia¹³.

Therapeutic uses -

- The bark is bitter and astringent to the bowels and it is useful in liver complaints, chronic diarrhoea, ophthalmic and eyesores, anaemia, urinary discharges, and piles, skin diseases and erysipelas.
- The root is pungent, acrid, and stomachic; and roots increase biliousness.
- The juice of the leaves is given in purulent discharges from the ear.
- The fruit is acrid, dry and with flavour; it is cooling, astringent to bowels .The plant is

considered useful in the treatment of snake-bite and scorpion – sting.

- The flower and ash of the roots, bark and leaves are useful in various ailments¹⁴.

Ethno- botanical properties –

The wealth of tribal knowledge on medicinal plants points to a great potential for research and the discovery of new drugs to fight diseases including diabetes. . Some of these plant derived medicines, however offer potential for cost effective management of diabetes through dietary interventions, nutrient supplementation, and combination therapies with synthetic drugs in the short term. Dhava has property of antiseptic and used in wound healing, treatment of tumour and cancer, Rheumatism and burning sensation. Parts of the tree find use in piles, diabetes, and anaemia and as an antidote to snake bite .The flowers are used as aphrodisiac, astringent, antipyretic and antidiarrheal. The bark pounded with water to prepare decoction .one teaspoon of the decoction is taken daily in an empty stomach for 3-4 months to get relief for diabetes .In stomach-ache, headache, cough, asthma, and leucorrhea. The gum is used as a tonic after delivery and in arthritis. The root is used in stomach-ache and liver troubles¹⁵.

Recent researches-



Antioxidant and Hepatoprotective activity –

Govindarajan et al have studied the antioxidant potential of *dhava* plant extracts and found that it contains good to moderate anti-oxidant potential¹⁶. Pradeep et al studied hepatoprotective activity of hydro-alcoholic extract of AL and evaluate its activity both *in vitro* and *in vivo*. The presence of polyphenols and flavonoids supports its antioxidant potential¹⁷. Quercetin and rutin are reported to be potential therapeutic agents as they reduce oxidative DNA damage, lipid peroxidation and quench free radicals¹⁸.

Antiulcer and antimicrobial activity –

The AL bark has been studied for its potentials utilizations as antiulcer drug. The hydro-alcoholic extract of AL showed potential gastro protective activity, the possible mechanism is due to decreased LPO and SOD with concomitant increase in catalase activity¹⁹.

Wound healing activity –

Govindarajan et al studied wound healing potential of *Anogeissus latifolia* (Dhava), extracts and observed there was a decrease in epithelisation period, along with 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 itching²⁰.

Anthelmintic activity -

Various extracts of bark and leaf of AL have been evaluated for anthelmintic activity against earthworm model. All the extracts moderate to significant anthelminthic activity²¹.

DISCUSSION

The above study, result from the ‘vedas’ and different ‘Samhitas’ like *Charak samhita*, *Susruta samhita*, *Astang Hridaya* and from different *Nighantus*. *Anogeissus latifolia* (Dhava), traditionally known as “Dhava” means “Its leaves shaking in air and its bark is whitish in colour”. In Ayurveda it is considered beneficial in *raktapitta*, *kustha*, *prameha*, *arsha*, *pandu* etc. Due to its properties like *rasa- katu*, *kasaya*, *gunalaghu*, *ruksha*, *vipaka- katu* it is beneficial in *prameha*. It has tremendous properties viz. *kaphapittasamak*, *ruchya*, *dipana*. Its gum is ‘vishahara’ in properties. Due to its hypolipidemic action it is also play an important role in metabolic disorders.

CONCLUSION

In a nutshell, the present review is indicative of multiple uses of ‘Dhava’ in different diseases. ‘Dhava’ is a plant with a rich ethnobotanical history. The present



review on dhava of different parts of plant is used in different disease treatment. *Dhava* has properties of *guna* – *laghu*, *ruksha*, *rasa* – *kasaya*, *vipaka* – *katu*, *virya* – *sita*, *kapha* – *pittashamak*, *raktarodhak*, *vranaropana*, *shothahara*, *mutrasangraharniya*, *rasayan*, *vishaghna*. It is used in *atisara*, *pravahika*, *raktarsh*, *raktavikar*, *raktapitta*, *prameha*, *kustha*, *pandu*, scorpion bite, snake bite. In this regard, further studies need to carry out to explore ‘*Dhava*’ for its use in preventing and treating diseases.



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