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Apamarga (*Achyranthes aspera*) a Lord of All Plants

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ABSTRACT

Achyranthes aspera commonly known as Apamarga is herbal medicinal plant distributed throughout India and is used traditionally in wound healing, piles, skin diseases and dental problems. Different constituents are present in different parts of Achyranthes aspera like saponin, oleanic acid, achyranthine, ecdysterone, alkaloids, flavonoids, steroids and terpenoids. The review reveals that a large number of phytochemical constituents have been isolated from the plant which possesses several ethnobotanical uses as well as pharmacological activities like antibacterial, antifungal, antipyretic, diuretic, purgative, laxative, antiasthmatic, hepatoprotective and anti-allergic.

Keywords: Antiasthmatic; Apamarga; Pharmacological activities; Traditional medicine; Ayurveda.

Introduction

Achyranthes aspera: Common name Chaff-flower, prickly chaff flower, devil horsewhip, Sanskrit known as Apamarga. It is sepsis of plant *Achyranthes aspera* belonging to family Amaranthaceae. It is circulated throughout the tropical world. It can be found in many places rising as a presented cad species and common weed it is aggressive species in some areas, including many pacific Island environment [1].

Ayurveda is the one of the ancient and comprehensive systems of health care. An analysis of Ayurvedic treaties signifies that various aspects of Ayurveda were involved from time to time. It has got number of medicinal uses and is beneficial to us (Figure 1) [2].

Figure 1: *Achyranthes aspera.*

Materials and Methods

Apamarga in Veda

Rigveda: In Rigveda while describing medicinal plants, origin of medicinal plant dated back three Yuga prior to life became existence on earth. This shows the benefits of medicinal plants. In Rigveda no reference of Apamarga noticed [3].

Yajurveda: In different Samhitas of Yajurveda, Saktu *i.e.*, the powder of Apamarga used in Hawan for the aim of Rakshoghnaproperty. It should be used after removing the water content from it. This represents that it should be used after drying or no other plant has got such property of removing water content from our body. It has got property like Papanashan, Mritunashanaand Duhswapnanasana. Kushthais known to be paaproga. This indicates towards the Kushthaghnaproperty of Apamarga. Duhswapnanashana indicates its Metaproperty [4].

Samaveda: In Saamvedano reference of Apamargawas noticed.

Atharvaveda: Atharvaveda is the fourth and last Veda of Hindu literature. Its oldest name was 'Atharvangirasa', because it was contributed by two sages, ATHARVAN and ANGIRA. It is also known as 'Bhaisajyaveda'. The Ayurveda is said to be the Unpaved of Atharvaveda, whereas according to Acharya Kashyap Ayurveda is considered as fifth Veda. Atharvaveda broadly quoted Apamarga according to the etymology provided by Sayana, this plant drives away the vitiated Doshas from the body. Paippalada school of Atharvaveda describes it as Dourbhagyanasanaand Anapatyanasana. This indicates towards is Kushthaghna property. Apamargais considered as lord of all plants because it possesses hundreds of properties and wipe away all the diseases. Apamargais used to treat diseases caused by thirst, hunger, sterility etc. Apamargawipe away diseases like Kshetriya rogaand prevent Yatudhan Krimi. Sayanaand the native tradition considers it to be an anomalous word signifying a disease beginning with consumption, skin disease and epilepsy, derived from the limbs of father or mother, curable in the body of grandson or son. Apamargawipe away the diseases which occur due to sitting together with person having black teeth, diseased nails, or one who is deformed. This mantra indicates towards the Sansargaja Kushtha [5,6].

Taxonomic classification

Kingdom: Plantae

Subkingdom: Tracheobinota super

Division: Spermatophyta

Division: Magnoliophyte

Class: Mangoliophsida

Subclass: Caryophyllidae

Order: Caryophyllales

Family: Amaranthaceae

Genus: *Achyranthes*

Species: *Aspera vernacular*

Vernacular name

Arabic Atkumah

Bengali Apang

Burmese Kune-la-mon

English Rough chaff /Prickly chaff – flower, devil's horsewhip

Gujarati Aghedo

Hindi Latjira, Aghara, Apamarga, Chirchira, Chirchit

Kannada Uttatane

Konkan Uttatene

Malayalam Katalati/Kadaladi

Marathi Aghadha/Pandhara–agada

Persian Khare–Vazhun

Punjabi Kutri

Tamil Nayurivi/Shiru-kadaladi

Telugu Uttareni/Antisha/Apamargamu

Sanskrit Apamarga/Aghata/Kharamanjari

Sinhala Karala heba

Urdu Chirchita

Results

Pharmacological activities

Hepatoprotective activity: Bafna and Mishra reported that the methanol extract of the aerial parts of *A. aspera* shown hepatoprotective activity on rifampicin induced hepatotoxicity in albino rats [7,8]. Methanol extract also showed dose dependent decrease in the levels of SGPT, SGOT, ALKP and total bilirubin [9-11].

Antiviral activity: Chakraborty et al., reported the *in vitro* assay of the methanol leaves extract of *A. aspera* (100 µg) which revealed significant inhibitory effects on the Epstein-Barr virus early antigen induced by the tumor promoter 12-Otetradecanoylphorbol-13-acetate in Raji cells. The fraction containing mainly non-polar compounds showed the most significant inhibitory activity (96.9% and 60% viability). In the *in vivo* two stage mouse skin carcinogenesis test the total methanol extract reported a pronounced anticarcinogenic effect. The total extract and the fraction are believed to be valuable anti-tumors promoters in carcinogenesis [12].

Anti-inflammatory activity: The alcohol extracts of leaves and seeds of *A. aspera* shown anti-inflammatory activity in rats using carrageenin-induced paw edema method and formalin model. Ethanol extract of *A. aspera* at the doses of 50, 100, and 200 mg/kg were screened for their effect on acute and chronic inflammation induced in mice and rats using carrageenin and freund's complete adjvant model. Anti-arthritic activity Neogi et al., the water-soluble alkaloid achyranthine was screened for its anti-inflammatory and antiarthritic activity against carragennin induced foot odema, granuloma pouch, formalin induced arthritis and adjuvant arthritis in rats [13].

Spermicidal activity: Ethanol extract of root of *A. aspera* showed post coital antifertility activity in female albino. Root extract of *A. aspera* shown spermicidal activity in human and rat sperms. Pakrashi and Bhattacharya reported that the benzene extract of the whole plant of *A. aspera* shown abortifacient activity in mice. Shibeshi, et al. also reported the spermicidal effects of methanolic extract of the leaves [14].

Anti-fertility activity: Prakashi and Bhattacharya reported that the benzene crude extract has abortifacient effect in mice. The alcoholic extract of root bark of *A. aspera* inhibit the response of oxytocin in isolated rat uterus but this fraction did not inhibit the responses to serotonin and acetylcholine in the rat uterus [15] .

Discussion

Antioxidant activity: Antioxidant activity of *A. aspera* crude root extract was evaluated in a series of *in vitro* assay 1,1-diphenyl-2-picrylhydrazyl (DPPH) and Hydroxyl Radical Scavenging method were determined. Antidiabetic and Hypoglycemic activity Aqueous and methanol extracts of the powdered whole plant of *A. aspera*, showed hypoglycemic activity. Blood glucose levels of normal and Alloxan induced diabetic rabbits were determined after oral administration of various doses. The ethanol extract of *A. aspera* seed exhibited significant hypoglycemic activity in streptozotocin induced diabetic rats. Akhtar, et al., reported the aqueous and methanol extracts of the powdered whole plant of *A. aspera* shown hypoglycemic activity. Blood glucose levels of normal and Alloxan induced diabetic rabbits were determined after oral administration of various doses [16].

Larvicidal activity: Ethanol crude extract of *A. aspera* showed high larvicidal activity on the tick larvae against *Boophilis microplus*. Larvicidal saponins from leaf extracts of *A. aspera* have been tested against *Aedes aegypti* and *Culex quinquefasciatus*. Ethyl acetate leaf extract was found to be active against *Aedes subpictus* mosquito larvae. *A. aspera* was mentioned to have activity in controlling mosquito larvae. Essential oils of leaf and stem extracted by steam distillation were found to possess larvicidal activity against *Aedes aegypti* and *Culex quinquefasciatus*. Leaf extracts of the *A. aspera* have been reported to be active against *Aedes aegypti* [17].

Anti-dandruff activity: Suresh et al., reported that the methanol leaf extract of *A. aspera* as a constituent of a Polyherbal Hair Oil (PHO) showed anti-dandruff activity. Neuropharmacological activity methanol extract of the *A. aspera* was reported to have neuropharmacological activity. It possesses antidepressant 50 and anxiolytic 51 activities. The plant was screened *in vitro* for anti-hypertensive effect. Renal disorders mineralization of urinary stones like calcium oxalate, calcium carbonate and calcium phosphate were found to be inhibited by *A. aspera*. Methanol extracts were found to prevent lead induced nephrotoxicity in albino rats. Efficacy of the roots of the plant was tested on calcium oxalate crystal nucleation and growth *in vitro* and on oxalate induced injury in NRK-52E (rat renal tubular epithelial) cells [18].

Antiobesity activity: Mangal et al., reported that the plant was clinically investigated against obesity and showed positive result. Veterinary uses *A. aspera* was reported to have diuretic activity in goats and diarrhea preventive activity in piglets. Therapeutic efficacy of herbal preparation involving the plant in induced hepatopathy in sheep was tested [19].

Prothyroidic activity: Tahilani et al., reported leaves extracts of *A. aspera* to have prothyroidic and antiperoxidative properties. In rats, the plant extract induced changes in thyroid hormone concentration and decrease hepatic lipid peroxidation [20].

Conclusion

Therapeautic and traditional uses

- Apamarga root is taken with water in Visuchika.
- In Sidhma, seeds of Mulaka and fresh juice of Apamarga are made to paste and applied externally.
- Decoction of Kakjangha, Apamarga, Kokilaksa, and Suparnika is useful in Nidranasa (insomnia).
- The root of Apamarga and *Piper nigrum* is used in snake poison.
- The decoction of Apamargaa, Yastimadhu, Gokshura, and Patha is used for urinary tract infections.
- Apamarga kshara is used in chronic cough disease with Pippali, Ativisha, Kupilu, Ghrit, and Madhu.
- Apamarga root is made as a paste with Tanduloodak and used with honey in Arsha. The paste of seed of Apamarga is used for Raktrasha externally.
- In Ashmari, Apamarga kshara is used with sheep milk.

- The juice of Apamarga is painted on gums in toothache.
- Apamarga is one of the essential plants in the management of Kaphaja Timira as fumigation.
- Apamarga seeds powder as an avapidanasya helps cure Apachi (cervical Lymphadenopathy).
- The collyrium prepared with Flowers of Apamarga is useful in Praklinnavartma (eyelid disease).
- Decoction of powdered leaves with honey or sugar candy is useful in the early stages of diarrhea and dysentery.
- Crushed plant is boiled in water and is used for pneumonia. Infusion of the root is a mild astringent in bowel complaints. The flowering spikes or seeds, ground and made into a paste with water, are used as an external application for bites of poisonous snakes and reptiles, used in night blindness and cutaneous diseases.

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