ACHYRANTHES ASPERA LINN. (CHIRCHIRA): A MAGIC HERB IN FOLK MEDICINE

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Abstract

Prickly chaff (*Achyranthes Aspera* linn) herbs are vital source of drugs from the ancient time holding the scenario of the Indian system of medicine.*Achyranthes Aspera* linn known as chirchira in hindi is an indigenous herb found in India, It has been used in almost all the traditional system of medicine, ayurveda, unani, and sidha from the ancient time . The tribal, rural, and aboriginal people our country commonly in this herb in various disorders.*Achyranthes Aspera* leaves reported to have antimicrobial property so mostly used in the treatment of skin and teeth disorder.The present paper enumerates the ethnopharmacognostic, ethopharmacologic, traditional value and folk remedies of this herb, which may help the researchers to set their minds for approaching the utility, efficacy and potency of herb.

Keywords: *Achyranthes aspera*, Chirchira, Traditional and folk remedies, Ailments.

1. INTRODUCTION [1-5]

The ethnic and rural people of India have preserved a large bulk of traditional Knowledge of medicinal uses of plants growing around them. This knowledge is handed down to generations through word of mouth and is extensively used for the treatment of common diseases and conditions. Chirchira has occupied a pivotal position in Indian culture and folk medicine. It has been used in all most all the traditional system of medicine viz., ayurveda, unani and sidha. From the ancient time the tribal, rural and aboriginal people of our country commonly use this herb in various disorders. It holds a reputed position as medicinal herb in different systems of medicine in India. According to Ayurveda, it is bitter, pungent, heating, laxative, stomachic, carminative and useful for the treatment of vomiting, bronchitis, heart disease, piles, itching abdominal pains, ascites,

dyspepsia, dysentery, blood diseases etc. (Bhandari, 1990; Dwivedi et. Al., 2007) [16] The plant has been mentioned in manuscripts of Ayurveda and Chinese medicines. In Ayurveda, two varieties, red and white are mentioned. In Sanskrit, synonyms describe this as a rough flowered stalk. It is described in 'Nighantas' as purgative, pungent, digestive, a remedy for inflammation of the internal organs, piles, itch, abdominal enlargements and enlarged cervical glands. Hindus used ashes for preparing caustic alkaline reparations. The diuretic properties of the plant are well know to the natives of Indian and European physicians. Different parts of the plant form ingredients in many native prescriptions in combination with more active remedies (Agharkar, 1991) [11].

Chirchira, botanically known as Achyrathes aspera Linn. (A canescens R Br., A. argentea Decne, A. grandifolia Moz, A. repeaL.) belongs to family Amaranthaceae. In the country it is known by different names such as,

Chirchita:- Hindi Apamarga :- Sanskrit

Aghedi :- Gujrati Apang :- Bengali

Nayurivi :- Tamil Utranigida :- Kannadh

Katalati :- Malyalam

Apamaranga:- Orissha

Aghada :- Marathi

Apamargamu:- Telghu

2. PHARMACOGNOSY [6-8]

MACROSCOPIC

An erect herb or undershrub up to 1 m high. Main root, long cylindrical, thick, secondary and tertiary roots present, slightly ribbed, yellowish brown in colour; odour slight; taste slightly sweet and mucilaginous. Stem yellowish brown, erect, branched, cylindrical, hairy, solid, about 60 cm high. Leaves petiolate, alternate, elliptic-obovate or sub-orbicular, Acute, entire, pubescent above and usually white woolly beneath. Flowers greenish-white, in small dense axillary heads or spikes. Bracts and bracteoles persisting ending in a spine. Seeds subcvlindric, truncate at the apex, rounded at the base, black and shining.

Microscopic

Root - Cork, 6-10 layers. Arcs of phloem and conjunctive parenchyma are much longer. Pith absent. Vessels possessing simple, bordered pits and helical thickening, tracheids with tapering end walls.

Stem- T.S of stem shows 6 -10 prominent ridges and collenchyma present under each

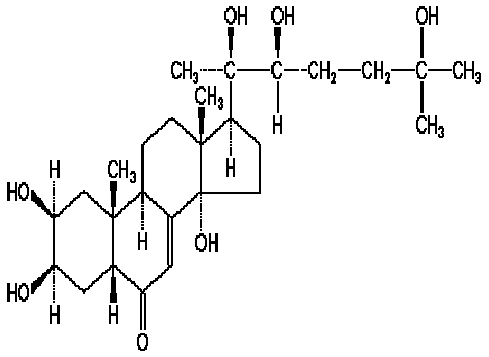
ridge. Pitted (simple and bordered) vessels drum-shaped with horizontal end-wall perforations. Tracheids elongated with somewhat tapering end with simple pits. Calcium oxalate crystals of rosettes, prismatic or glandular forms being present. phloem fibres absent.

Leaf- Upper epidermal cells more or less straight walled while the lower ones wavy. Both the epidermis show anomocytic type of stomata.Trichomes of covering and glandular type are seen, the lower surface possessing greater number. Rosettes of calcium oxalate crystals distributed among the lower palisade layer.

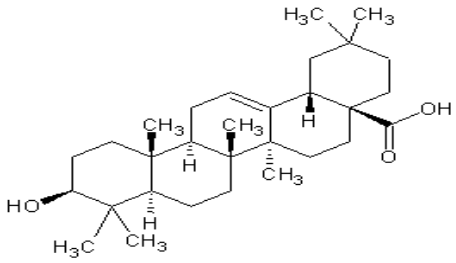
3. CHEMICAL CONSTITUENTS

Major: triterpenoid saponins possessing oleanolic acid as aglycone viz; A,B,C,D.

Others: Ecdysterone, an insect moulting hormone long chain alchohols viz., 17-penta triacontanol, 27-cyclohexylheptacosan-7-ol, 16-hydroxy-26-methylheptacosan-2-one and 36, 47-dihydroxyhen-pentacontan-4-one; a water soluble base, betaine .



Ecdysterone



Oleanolic Acid

4. PHYTOCHEMISTRY

The plant contains triterpenoid saponins possessing oleanolic acid as aglycone, viz. A, B, C and D as major chemical constituents. Other constituents of the plant are ecdysterone, long chain alcohol, viz. 17-penta triacontanol, 27-cyclohexyl heptaeosan-7-ol, 16-hydroxyl 26-methyl heptacosan-2one and 36, 47-dihydroxy hen-pentacontan-4one. It also contains a water soluble base, betaine. The chemical constituents of A. aspera are shown in Table 1.

5. PHARMACOLOGY

From the point of view of pharmacological activity of A. aspera, a number of works have been done. Some of the reported pharmacological activities of A. aspera are mentioned in Table 2.

6. SAFETY ASPECTS

This plant is known to possess abortifacient and contraceptive properties, and hence should be avoided during pregnancy. However, the drug is devoid of any side effect up to the dose of 8 g/kg, orally in rabbits[9].

7. FOLK REMEDIES AND TRADITIONAL USES

The herb is widely used to treat various kinds of ailments. Various traditional uses of the herb are mentioned in Table 3.

8. CONCLUSION

Herbs are the natural folk drugs,and are used in many diseases. So precaution should be taken for remove out adverse of drugs.The WHO has already recognized the contribution of traditional health care in tribal communities. It is very essential to have a proper documentation of medicinal plants and to know their potential for the improvement of health and hygiene through an eco friendly system. Thus importance should be given to the potentiality of ethnomedicinal studies as these can provide a very effective strategy for the discovery of useful medicinally active identity. A detailed and systematic study is required for identification, cataloguing and documentation of plants, which may provide a meaningful way for the promotion of the traditional knowledge of the herbal medicinal plants. The present review reveals that the herb chirchira is used in treating various ailments. It elicits on all the aspects of the herb and throws the attention to set the mind of the researchers to carry out the work for developing its various formulations, which can ultimately be beneficial for the human beings as well as animals.

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Table 1: Chemical Constituents of *Achyranthes Aspera* Linn.

S. No.	Constituents	References
1.	Ecdysterone	Banerjee and Chandha (1970) [12]
2.	Achyranthine, N-methyl pyrrolidine-3 carboxylic acid	Basu (1957) [14]
3.	Saponins from alcoholic extract of defatted seeds	Gopalanchari and Dhar (1958) [25]
4.	Vitamin C	Hasan (1962) [27]
5.	Saponins C and B	Hariharan and Rangaswami (1970) [31]
6.	Inokosterone ecdysterone in callus and tissue culture	Hiroshi et. al. (1971) [32]
7.	Water soluble base, betaine	Kappor and Singh (1966) [39]
8.	Oleanic acid from seeds	Khastgir et.al. (1950) [42]
9.	Enzyme level	Puroit et. al. (1980) [53]
10.	Saponins C and D from unripe fruits	Sheshadri et.al. (1981) [66]
11.	AA, CHO, protein, Fe, Ca, phosphorous	Satyanarayana et.al. (1964) [67]

Table 2: Pharmacological activities of *Achyranthes Aspera* Linn.

S. No.	Pharmacological Activity	Reference
1.	Abortifacient	Basu *et al*. (1957), Bhattacharya (1977), Kapoor and Singh (1967), Pakrashi *et al*. (1975)
2.	Cardiovascular	Basu *et al*. (1957), Kapoor and Singh (1966), Neogi *et al*. (1970), Ram *et al*. (1971 & 1972)
3.	Effect on urinary tract	Ghosh *et al*. (1980), Kapoor and Singh (1967), Ram and Tripathi
4.	Antibacterial and antifungal	Dhar *et al*. (1968), George *et al*, (1947), Neogi and Shrivastava (1957), Ikram and Haq (1980), Khurana *et al*, (1970)
5.	Juvenile	Benerjee *et al*. (1971), Masatoshi *et al*. (1967), Otaka *et al*. (1980), Rajendran and Gopalan (1970), Robins *et al*. (1968), sekeris *et al*. (1967)
6.	Antidiabetic	Dhar *et al*. (1968), El-Kheir and Salik (1980)
7.	Spasmolytic	Neogi *et al*. (1970), Singh (1967)
8.	Antiasthmatic	Chayaralu (1982), Mahaskar and Caius (1931)
9.	Antiallergic	Saha and Kalyansundaram (1962)
10.	Astringent	Chopra *et al*. (1958)
11.	Emetic	Chopra *et al*. (1958)
12.	Abdominal tumor	Hartwell (1976)
13.	Chemoprotective	Chakaborty *et al*. (2002)

14.	Diuretic	Nadkarni (2005)
15.	Antiperiodic	Nadkarni (2005)
16.	Purgative	Nadkarni (2005)
17.	Pain in the chest and used as a antacid due to its high potash content	Nadkarni 1976
18.	Pain in joints and rheumatism	Shanker 1979 jain and tarafdar 1970
19.	Antifungal of essential oil and a long chain fatty alcohol	TrigunaN. Mishra Rams *et al* 2001.
20.	Antimicrobial finish for cotton fabric used in healthcare textiles	In 1968 dhar *et al*
21.	Antiviral and anticarcinogenic effect	Chakraborty A *et al*, 2002
22.	Antifungal and antibacterial activity	George *et al* 1947
23.	Increase immunity power	Rao Vasudevay. *et al* 2006
24.	Effect on fertility of animals	Pakrashi *et al* 1975
25.	Increase thyroid harmone level and decrease hepatic lipid	Tahiliani *et al* 1999
26.	Significant antidiabetic activity	Dhar *et al* 1968
27.	Analgesic activity	Kumar Hemant *et al* 2009
28.	Nephrotoxicity activity	Swaminathan Govindasamy *et al* 2009
29.	Antifungal activity	Elumalai EK *et al* 2009

Table 3: Folk remedies and traditional uses of *Achyranthes Aspera* Linn.

S. No.	Part used	Preparation	Use	References
1.	Whole plant	Decoction boiled with water for 20-30min. taken at night	Diuretic in renal dropsies and general anasarca	**N**adkarni (2005)
2.	Whole plant	Decoction taken two tablespoon three times a day	Beriberi	Dwivedi (2004)
3.	**W**hole plant	Decoction boiled with water and taken twice a day	Pneumonia	Rangari (2006)
4.	Whole plant	Infusion in water taken thrice a day	Bronchial infection	Gopalachari & Dhar (1958)
5.	Whole plant	Powder with lukewarm water or milk taken twice a day	Blindness in cattle and rheumatism	Shankar (1979), Jain & Tarafdar (1970)
6.	Whole plant	Ash of plant with honey twice a day	Cough	Chopra (1933)
7.	Whole parts	Prepare a paste form in suitable solvent	Chill	George 1974 *et al*
8.	Roots	Decoction boiled with water and taken twice a day	Pneumonia	Haerdi & Eingeborenosis (1964)
9.	Roots	Two teaspoonful powder taken once at night	Astromgent and bowel complaints	Quisumbing (1951)
10.	Roots	Two teaspoonful powder taken once at night	Stomachic and digestive	Chopra (1933)
11.	Roots	Extraction of roots taken at night	Menstrual disorders	Singh & Singh (1981)
12.	Roots	Powder taken with water daily	Leprosy	Rao (1981)

13.	Roots	Paste taken with water daily	Antifertility	Malhi & Trivedi (1972
14.	Roots	Infusion in water taken thrice a day	Mild astringent	Nadkari (2005)
15.	Roots	Ashes mixed with water	Cough, ascites and anasarca	Nadkarni (2005)
16.	Roots	Powder taken twice daily	Bleeding in delivery	Dwivedi (2003)
17.	Roots	Use as a paste form	Bleeeding and abortion	Sahu 1982
18.	Root	Prepare a powder form	Dysentery	Wilson and Mariam 1979 *et al*
19.	Leaves	Juice taken with water ay bed time	Bowel complaint, pile, boil, stomache, skin eruption	Nadarni (2005)
20.	Leaves	Decoction of powdered leaves taken twice day	Early stages of diarrhea and dysentery	Nadarni (2005)
21.	Leave	Large juice produce labour	pain and abortions	Nadkarni 1979
22.	Leave	Use a extract of leaf	The leaf is used as a remedy for boil and abscess	Watt 1962
23.	Leave	Prepare leaf extract in suitable solvent system	Leaf is used as an emetic	Quisumbing 1951
24.	Flowers	Crushed flowers paste taken daily	Menorrhagia	Rangari (2006)
25.	Flowers	Grounded into paste as external use	Snakes and reptiles bites	Nadkarni (2005)
26.	Fruits	Unripe fruits taken thrice	Respiratory disease	Rangarin

		daily		(2006)
27.	Seed	Use as a powder form	Used in the treatment of snake bites hydrophobia, itching	Watt and Breyer 1962 *et al*