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Research Article

Pharmacognostic, Preliminary Phyto Chemical and Pharmacological Studies on the Roots of *Achyranthes aspera*

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ABSTRACT

The present study deals with pharmacognostic, preliminary photochemical and pharmacological investigations of Achyranthes aspera. In this, pharmacognostical studies are concerned for the determination of physicochemical constants like ash values, extractive values, and loss on drying .The roots were subjected to soxhlation using petroleum ether, alcohol, water and the extracts thus obtained were studied for preliminary photochemical screening for detection of presence of various classes of chemical principles viz., carbohydrates, proteins, steroids, glycosides, alkaloids, tannins, saponins, flavonoids and lignin.. Pharmacological studies were carried out to evaluate acute oral toxicity and anti microbial activity.The results obtained in the present investigation reveal that one or more extracts of A.aspera has shown anti cancer, anti diabetic, anti inflammatory, anti spasmodic, anti bacterial, diuretic and antileprotic activities.

key words:Achyranthesaspera,pharmacognosy, phytochemistry,pharmacological, Anti inflammatory, Diuretic.

INTRODUCTION

The dried roots were obtained from the plant Achyranthes aspera Linn; Family: Amaranthaceae is known by other names: Uttaranee, Kadaladi, Aghada, Kutri, Nayuruvi, Antisha is found in ever green forest of Western Ghats mainly seen in south kerala and southern part of Tamilnadu. Compounds in the seeds ofA.aspera are the saponins A and B.Anti inflammatory activity of root of A.aspera were reported by Sankar et al (2009)and other pharmacological activities like anticancer , diuretic, anti leprotic, anti asthamatic were also reported in the profile of A.aspera Linn. Spermicidal action of a protein isolated from ethanolic root extracts of A.aspera .Hypoglycemic effect of A.aspera was evaluated in normal and alloxan –diabetic rabbits by Akthar MS, Iqbal J(1991).

MATERIALS AND METHODS

Plant material:The plant A.asperawas collected in the month of august 2012 from (village) kantepudi , Guntur (dist), Andhra Pradesh. The plant was identified and authenticated by professor V.Jaya, Botanist, Department of Botany, Hindu college, Guntur, Certificate no-Hindu College/Botany/08.

Method:Treatment and pulverization:The roots were collected,washed with water and dried in a sunlight for 1 hour and then dried in shade. Then the powder was passed through sieve no.60 for powder analysis and coarse fraction was subjected for phytochemical studies.

pharmacognostic evaluation:Pharmacognostic studies mainly include study of morphological characters, microscopical characters and powder microscopy. It also includes physico chemical constants like ash value; extractive values and loss on drying of the roots powder were carried out. Microscopy include evaluation of crude drugs such as authentication of crude drugs, Study of powdered drugs. Macroscopy include the evaluation of drug by color, odour, taste, size, shape in specific features

Table no. 1 Foaming index of the powdered root of A.aspera.

S.NO.	Test volumetric flask no.(10 ml)	Height of foam(cm)
1.	1	0.2
2.	2	0.3
3.	3	0.5
4.	4	0.6
5.	5	0.6
6.	6	0.8
7.	7	0.8
8.	8	0.8
9.	9	0.9
10.	10	0.9

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Table no.2 Data for ash values of the root of A.aspera

S.No	Parameter	%(w/w)
1.	Total ash	13.5
2.	Acid insoluble ash	3.5
3.	Water soluble ash	8.4
4.	Sulphated ash	1.5
5.	Water soluble extractive	6.8
6.	Alcohol soluble extractive	3.6
7.	Loss on drying	10.5
8.	Foaming index	nil

Table no.3 Preliminary phyto chemical analysis of powdered roots of A.aspera

S.No	Phytoconstituents	Petroleum ether extract	Alcohol extract	Aqueous extract
1.	Alkaloids	(-)	(+)	(+)
2.	Carbohydrates	(-)	(+)	(+)
3.	Glycosides	(-)	(+)	(+)
4.	Phytosterols	(-)	(-)	(-)
5.	Saponins	(-)	(+)	(+)
6.	Fixed oils and fats	(-)	(-)	(-)
7.	Tannins and phenolic compounds	(-)	(+)	(+)
8.	Proteins and free amino acids	(-)	(+)	(+)
9.	Gums and mucilage	(-)	(-)	(+)
10.	Flavanoids	(-)	(+)	(+)
11.	Lignins	(-)	(+)	(+)
12.	Volatile oil	(-)	(-)	(-)

Table no.4 Extractive values of powdered roots of A.aspera

S.No	Extracts	%(w/w)yield
1.	Petroleum ether	2.09
2.	Ethanolic extract	7.02
3.	Aqueous extract	5.35

Table no.5 Aqueous anti bacterial extract of A.aspera:

Test micro organism	Zone of inhibition (mm) of standard	Zone of inhibition (mm) of ethanolic extract.
Staphylococcus aureus	24	22
Streptococcus fecalis	26	24
Esscherichia .coli	25	-

like touch, texture etc. Microscopic features of A.aspera secondary phloem and secondary xylemwere observed. Powder microscopy of root consists of fibers, vessel elements and xylem parenchyma.

Prelimnaryphytocchemical evaluation:Total ash value, acid insoluble ash value, water soluble ash value, sulphated ash value,extractive values-alcohol soluble extractive value, water soluble extractive value(Table no.3), Loss on drying, foaming index(Table no.1) were determined by standard procedures and results were tabulated in table no.2.

Prelimnary Phytochemical Analysis**:**Powdered roots of A.aspera were subjected to various qualitative tests for the identification of phyto chemical constituents includes tests for alkaloids (Dragendroff's test, Mayer's test, Hager's test, Wagner's test). Saponins, glycosides(Legal's test, Baljet's test, Kellar-Killiani test, Borntrager's test). Carbohydrates (molish test, Fehling's test), tests for tannins, Flavonoids,Steroids (Liebermann –Burchardtest, Salkaowski test), Proteins (Biurette test, Ninhydrin test, Xanthoprotein test, Millon's test);Phytosterols, gums and lignin were performed by using specific reagent and results were tabulated in table no.3.

Pharmacological evaluation:Acute oral toxicity was evaluated which involves the identification or calculation of doses level that become evidence for non lethal toxicity which gives clear signs and symptoms of toxicity of a test drug or substance also provide information about $LD_{50.}$Antimicrobial activity was evaluated to prevent the growth of microbes. Antibacterial studies were carried out by disc diffusion method and diameter of zone of inhibition is measured. Antibacterial aqueous extract of A. aspera was also performed. Strains used as gram positive micro organism for anti bacterial studies are Staphylococcus aureus2079, Streptococcus fecalis2080.Strains used as gram negative micro organism is Escherichia.coli2065.The preparation of

culture media for the growth of bacteria were nutrient agar medium (beef extract, peptone, sodium chloride) and nutrient broth medium (beef extract, peptone, distilled water) at pH 7 and values were tabulated in table no.4.

RESULTS AND DISCUSSION

A.aspera has been investigated, identified and rationalized by using pharmacognostical, photochemical and antimicrobial activity.

a) Pharmacognostic evaluation:The macroscopic and microscopic studies of roots of A.aspera were investigated and reported.Macroscopic observation of root system and root surface were carried out.Secondary phloem and secondary xylem were studied by microscopic evaluation.powder microscopy consists of fibers, vessel elements and xylem parenchymaEthanolic extract of A.aspera at a concentration of 1% significant anti bacterial activity.

CONCLUSION

The photochemical investigation showed the presence of alkaloids, glycosides, proteins, free amino acids, lignin, carbohydrates, flavonoids, tannins and a phenolic compound were identified and anti microbial activity was identified. Further studies are required to isolate and characterize the active principle of A.aspera whichhaveanti microbial activity.

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