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Preliminary Phytochemical, Pharmacognostical and Microbial Screening of *Achyranthes aspera* (Amaranthaceae)

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ABSTRACT

The present study deals with pharmacognostic, preliminary phytochemical and microbial screening 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 seeds were subjected to soxhlation using methanol petroleum ether ethyl acetate and water. The extracts thus obtained were studied for preliminary phytochemical screening for detection of presence of various classes of chemical principles viz., alkaloids, tannins, anthraquinone and phenol.

Keywords: *Achyranthes aspera,* phytochemical, pharmacognostical and microbial screening

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INTRODUCTION

After decades of serious obsession with the modern medicinal system, people have started looking at the ancient healing systems like Ayurveda, Siddha and Unnani. This is because of the adverse effects associated with synthetic drugs. Herbal drugs play an important role in health care programs especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers 'all' plant parts to be potential sources of medicinal substances [1].

Achyranthes aspera belongs to the family-*Amaranthaceae*. It is an annual, stiff erect herb, and found commonly as a weed throughout India and used by traditional healers for the treatment of fever, dysentery and diabetes [2, 3]. Leaf decoction for cardiovascular toxicity has been reported [4], and the ethanol crude extract showed high larvicidal activity on the tick larvae against *Boophilis microplus* [5]. The root extract is well reputed for its pronounced insect molting hormonal activity [6] and the ethanolic extract of the leaves and stem of the plant inhibited the growth of *Bacillus subtilis* and *Staphylococcus aureus* bacterial strains [7]. Roots are used as astringents to wounds, in abdominal tumor and stomach pain [8]. The benzene extract of the stem bark shows abortifacient activity in the rat [9]. Leaf extracts were reported to posses thyroid stimulating, antiperoxidative and antifungal activity properties [10, 11]. *Achyranthes aspera* is an important medicinal plants [12]. Antioxidant and antibacterial activity [13].

MATERIALS AND METHODS

Preparation of extract

The aerial parts of *Achyranthes aspera* plant were dried and cursed to make coarse powder. The powder (300 gram) was extracted and Defatting with 1liter of petroleum ether (60-80) ^{o}C by continuous extraction method for 48hrs. After this marc used for methanolic and hydroethanolic extraction successively. The yield of methanolic and hydroethanolic extract was 8% and 16% w/w.

Physio-Chemical Parameters

Physio-chemical parameters of the powdered drug such as ash values, extractive values loss on drying (moisture content) were performed following the method of Anonymous and Indian Pharmacopoeia [14].

Preliminary phytochemical screening

Preliminary phytochemical screening performed by J.B. Harborne, et.al.[15-19].

RESULTS AND DISCUSSION

Table no.1 Data for ash values of the seeds of *Achyranthes aspera*

Sr. No	Parameter	%(w/w)
1	Total ash	12.32
2	Acid insoluble ash	1.35
3	Water soluble ash	10.22
4	Sulphated ash	3.6
5	Water soluble extractive	92.32
6	Alcohol soluble extractive	18.23
7	Loss on drying	23.34
8	Foaming index	nil

Table no.2 Preliminary phytochemical screening of the seeds of *Achyranthes aspera*

Sr. No	Phytoconstituents	Petroleum ether extract	Methanol extract
1.	Alkaloids	-	+
2.	Carbohydrates	+	+
3.	Glycosides	-	-
4.	Saponins	-	+
5.	Tannins and phenolic compounds	+	+
6.	Proteins and free amino acids	-	+
7.	Gums and mucilage	-	-
8.	Flavanoids	+	+
9.	Lignins	-	-
10.	Volatile oil	+	+

Table no.3 Minimum inhibition concentration of different extract of seeds powder of *Achyranthes aspera* with different microorganism

Sr. No.	Genes	Species	Methanolic extract µg/ml	Ethyl acetate extract µg/ml	Water extract µg/ml
1	Proteus	Mirabilis	100	25	50
2	Proteus	Vulgaris	50	50	25
3	Staphylococcus	Aureus	100	100	100
4	Micrococcus	Luteus	200	100	25
5	Bacillus	Cereus	200	100	50
6	Clostridium	Sporegenes	50	200	200
7	Mycobacterium	Smegmatis	25	25	100
8	Klebsiella	Pneumoniea	100	150	150
9	Salmonella	Typhimurium	200	100	50
10	Shigella	Flexneri	150	100	150
11	Vibrio	Parahaemolyticus	100	50	200
12	Pseudomonas	Aeriginosa	150	50	200
13	Bacillus	Pumilus	50	100	25
14	Staphylococcus	Epidermilis	250	100	200
15	Escherichia	Coli	100	50	25
16	Saccharomyces	Cerevisie	25	50	50

CONCLUSION

The phytochemical investigation showed the presence of alkaloids, glycosides, proteins, free amino acids, lignin, carbohydrates, flavonoids, tannins and phenolic compound were identified as well as pharmacognostical analysis and anti microbial activity was identified.

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