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Phytochemical Analysis and Uses of Mimosa pudica Linn. in Chhattisgarh

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Abstract: *Ethanolic extracts of Mimosa pudica leaves were screened for phytochemical constituents. Phytochemical analysis of the extract revealed that the antimicrobial activity of the plant materials is due to the presence of active constituents like alkaloids or tannins.Mimosa pudica is used in disease related to blood and bile, bilious fever, piles, jaundice, leprosy, ulcer and smallpox. In the present study ethanolic extracts of Mimosa pudica leaves and roots sample were obtained using soxhlet apparatus. Phytochemical studies for the presence of revealed that tannin and proteins are present in both the samples.*

Key words*: Antimicrobial activity,Mimosa pudica , phytochemical.*

I. Introduction

Mimosa pudica Family Mimosae known as sensitive plant in English and lajvanti or chuimui in Hindi language. The plant is distributed through out in India in moist locality. A diffuse prickly under shrub, is about 45-90 cm in height. Leaves bipinnately compound, pinnate 2-4 delicately arranged with 10-20 pairs of leaflets, rachis clothed with ascending bristles. Flowers pink, in globose heads, penduncles prickly, usually in auxiliary pairs all along the branches. Fruits bristly pods, flat, straw colored consisting of 3-5 one seeded segments. The roots and leaves are commonly used in treatment as bitter, astringent, acrid, cooling vulnerary, alexipharmic, diuretic antispasmodic, emetic, constipating and febrifuge (Vaidyaratanm, 2001).The present study intends to study about the phyto constituents of the plant extracts of Mimosa pudica against pathogenic microbes in Chhattisgarh.

Fig 1: Mimosa pudica Plant

Fig 2: Powdered Mimosa pudica leaves

Many plants species used traditionally have potential antimicrobial and antiviral properties (Shelef et al. 1983) and this has raised the optimistic thinking of scientists about the future of phyto-antimicrobial agents. (Das et al., 1999). Mimosa plant has a history of use for the treatment of various ailments and the most commonly used plant part for this purpose is the root, but flowers bark and fruit can also be utilized. Several research works have been carried out to study about the phytochemical components of Mimosa pudica (Ahmad et al. 2001; Arthur, 1954.) and also about the antimicrobial activity of the plant (Palacios et al., 1991). The major chemical substances of interest in these surveys were the alkaloids and steroidal saponins, however also been reported (Lozoya & Lozaya, 1989). The methanolic extract of leaves of M. pudica showed the presence of bioactive components like terpenoids, flavonoids, glycosides, alkaloids, quinines, phenols, tannins, saponins

and coumarin (Gandhiraja et al., 2009). In Manipur, a state in India, it is reported that the consumption of the decoction of leaves boiled in water causes diuresis, and is used in urinary tract infection. This plant has hepatoprotective, hypolipidemic, antifertility, antihapatotoxic, anti convulsant, anti depressant and wound healing properties. The seeds of the plant was also said to have diuretic property (Krishnaraju et al., 2006). Roots of mimosa contain tannin, ash, calcium oxalate crystals and alkaloid mimosine (Oudhia et al., 2006).

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II. Collection Of Plant Materials

Fresh leaves and root of Mimosa pudica were collected from Durg- Bhilai Region.

2.1 Sample Preparation

The sample leaf and root were washed with sterile water, shade dried, powdered and kept in an air tight container for further use.

About 20g of the powdered leaves were soaked in 100ml of methanol. It was left for 24 hours so that alkaloids, terpenoids and other constituents if present get dissolved. The methanolic extract was filtered using Whatmann 41 filter paper. It was again filtered through Sodium sulphate in order to remove the traces of moisture.

III. Plant Extraction Method Extraction:

20 gms of each sample were taken and extracted separately with 250 ml ethanol using soxhlet apparatus. The extract were collected and dried. The condensed extract was then dissolved in ethanol to the concentration of 100mg/ml. After that allow for 5 cycles and switch of the apparatus and then take the sample solution and extracted solution in a beaker and cover it with a paper and make holes on the paper for the evaporation of the solvent .Allow it for drying and then collect the residue from the beaker.

IV. Phytochemical Screening (Dey And Raman, 1957)

Phytochemical screening of the plant extract was carried out as per the methods and tests given by Dey and Raman (1957) to decipher the presence or absence of various phytocompounds. The stock concentration of plant extract 10 mg/ml was used.

4.1 Test for Tannins

4.1.1 Preparation of 0.1% ferric chloride:

To 99.9 ml of distilled water 0.1ml of ferric chloride reagent was added.

4.1.2 Ferric chloride Test

1 ml of the sample taken and a few drops of 0.1% ferric chloride was added and observed for brownish green or blue, black colouration.

4.2 Test for Saponins

To 1 ml of extract 5 ml of distilled water was added and shaken vigorously. Observed for soaking appearance indicates the presence of saponins.

4.3 Test for Flavonoids

To 1 ml of extract 5 ml of dilute ammonia solution was added, followed by addition of concentrated sulphuric acid along the sides of the tube. Appearance of yellow colouration.

4.4 Test for Alkaloids

1 ml of sample was taken to that few drops of Dragandoff reagent was added and observed for orange red colour.

4.5 Test for Protein

1 ml of sample was taken to that few drops of Bradford reagent was added. The blue colour was observed.

4.6 Test for Steroids

1 ml of the filtrate was taken to that 10% concentration H_2SO_4 was added and observed for green colour.

4.7 Test for Anthroquinones

1 ml of sample was taken to that aqueous ammonia (shaking) was added and observed for change in colour of aqueous layer (Pink, Red or Violet).

V. Result And Discussion

5.1 Phytochemical analysis

The crude extract of both samples were studied and the result were tabulated (Table-1) Phytochemical, which process many Ecological and physiological roles as widely distributed as plant constituents. Phytochemical exhibit wide range of biological effects as constituents at their antioxidant properties. The phytochemical analysis of the crude extract indicated the presence of tannins, proteins and steroids.

These compounds are known to be biological active and therefore aid the antimicrobial activity. Tannins have been found to form irreversible complexes with highly rich protein resulting in the inhibition of cell protein synthesis.

Tannins are known to react with protein to provide difficult tanning effect which is important for the treatment of influenced or ulcerated tissues. Herbs that that have tannins have the main component astringen are used for treating intestinal disorder such as diarrhea and dysentery. The presence of tannin in Mimosa pudica is the traditional treatment for ailments.

Steroidal compounds present in Mimosa pudica extracts are important due to their relationship with various anabolic hormones including sex hormones. Mimosa pudica extracts which exhibited antibacterial activity and antiviral activity. It is concluded that both extract could be potential source of active antimicrobial agent.

Table 1. Phytochemical Screening of Metanolic Extract of Mimosa pudica.

S.No	Tests	Leaves of Mimosa pudica
1	Terpenoids	+
2	Flavonoids	+
3	Steroids	-
4	Anthroquinone	-
5	Glycosides	+
6	Sugars	-
7	Alkaloids	+
8	Quinines	+
9	Phenols	+
10	Tannins	+
11	Saponins	+
12	Coumarin	+

VI. Conclusion

From above studies, it is concluded that the susceptibility of various microbial agents to different concentrations of Mimosa pudica indicates that plant is the potential source for antimicrobial compound. So further work on the profile in order to determine the nature of bioactive principles present in the plant and their mode of action.

In the present era, plant resources are abundant, but these resources are dwindling fast due to the onward march of civilization (Vogel, 1991). Although a significant number of studies have been used to obtain purified plant chemical, very few screening programmes have been initiated on crude plant materials. It has also been widely observed and accepted that the medicinal value of plants lies in the

bioactive phytocomponents present in the plants (Veeramuthu et al., 2008).

From the above studies, it is concluded that the traditional plants may represent new sources of anti-microbials with stable, biologically active components that can establish a scientific base for the use of plants in modern medicine. These local ethnomedical preparations and prescriptions of plant sources should be scientifically evaluated and then disseminated properly and the knowledge about the botanical preparation of traditional sources of medicinal plants can be extended for future investigation into the field of pharmacology, phytochemistry, ethnobotany and other biological actions for drug discovery.

References

[1]. Ahmad I, and Beg A Z J, 2001. "Antimicrobial and phytochemical studies on 45 Indian medicinal plants against multi-drug resistant human pathogens." Ethnopharmacol 74 :113-23.
[2]. Arthur H R, 1954."Phytochemical Analysis of Mimosa pudica" J Pharm Pharmacol 66–72.
[3]. Das S, Pal S, Mujib A and Dey S, 1999. "Biotechnology of medicinal plants- Recent advances and potential." Ist Edition, Vol II (UK992 Publications, Hyderabad), 126-139.
[4]. Deininger R, 1984. Lectures of the Medical Congress Berlin: Firma Klosterfrau, 31.Germplasm Resources Information Network 2008. "Mimosa pudica L.". GRIN, United Koln. 24
[5]. Dey B and Sita Raman MV, 1957. "LaboratoryManual of organic Chemistry". S. Viswanathan publication, Madras.
[6]. Gandhiraja N, Sriram S, Meenaa V, Srilakshmi J K, Sasikumar C and Rajeswari R, 2009. "Study of different Chemical Components of Mimosa pudica." Ethnobotanical Leaflets, 13: 618-24.
[7]. Krishnaraju AV, Rao TVN, Sundararaju S, Vanisree M, Tsay HS, Gottumukkala V, Subbaraju G, 2006. "Use of Medicinal plants in Aurveda" Int. J. Appl. Sci. Eng., 4: 115-125.
[8]. Lozoya M, Lozaya X, 1989. "Weed plants and its uses."nTepescohuite Arch. Invest. Mex., pp. 87-93.
[9]. Ojalla T, Remes S, and Hans P, 1999. "Antimicrobial activity of some coumarin containing herbal plants growing in Finland". J. Ethnopharmacology, 68 : 267-274.
[10]. Oudhia P, 2006. " Preliminary Phytochemical Analysis and Anti-Bacterial Activity of Mimosa pudica Linn. Leaves. Available from: http://www.hort. purdue.edu/newcorp /corpFactSheets/mimosa.html.
[11]. Palacious C, and Reyes R E, 1991. Antibacterial and Antimycotic of Mimosa pudica in experimental animals, Arch Invest Med. (Mex), 22(2) : 163-169.
[12]. Shelef L A, 1983. Antimicrobial effects of spices. J. Food Safety 6 : 29-U S Forest service. States Deptt. of Agriculture, Agricultural Research Service, Beltsville Area.
[13]. Vaidyaratanm P S, 2001. Indian medicinal plants database, 1st edn,Orient Longman, Arya Vidyashala, Kottakkal, II, 36-37.
[14]. Zaika L J, 1988. Evaluation of wound healing activity of root of Mimosa pudica.Food9:97-111.