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RESEARCH ARTICLE

PRELIMINARY PHYTOCHEMICAL EVALUATION OF ROOT OF *SIDA CORDIFOLIA LINN.*

Anuja Varghese[1] and Dr. Jollykutty Eapen[2].

1. PG Scholar, Department of Dravyagunavijnanam, Government Ayurveda College, Thiruvananthapuram.
2. Professor and Head, Department of Dravyagunavijnanam, Government Ayurveda College, Thiruvananthapuram.

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Abstract

Sida cordifolia Linn. (Malvaceae) is a widely used drug for various ailments in Ayurvedic medicine. It is considered as *Bala* in Ayurvedic classical text books. Phytochemical evaluation of a drug helps in its standardization and to justify its use in various formulations. In this study, preliminary physical and phytochemical evaluation of root of *Sida cordifolia Linn* including High Performance Thin Layer Chromatography was done. Qualitative analysis showed the presence of steroid, alkaloid, saponin, tannin and flavonoids.

Introduction:-

Bala is an important drug in many of the Ayurvedic formulations. In Ayurveda, the drug is found to be useful in arthritic conditions, antenatal care, rejuvenation etc. The Ayurvedic Formulary of India has identified *Bala* as *Sida cordifolia Linn*. (Malvaceae)[1]. Root is the suggested plant part to be used for *Bala*[2]. Phytochemical analysis of the plant helped in confirming its genuinity. Qualitative evaluation was done to analyze the presence of phyto-constituents. High Performance Thin Layer Chromatography revealed the presence of chemical constituents which help in the identity of the drug. Atomic Absorption Spectroscopy was done to assess the presence of heavy metal in the sample. The study will help to compare the results with phytochemical values of aerial parts of *Sida cordifolia Linn*. which has already done[3].

Materials And Methods:-

Plant Material:-

Root of *Sida cordifolia Linn*. was collected from their natural habitat, from Thiruvananthapuram. The roots were washed well, shade dried and made into powder form to conduct the study. The plant was authenticated by comparing with different floras.

Corresponding Author:-Anuja Varghese.
Address:-PG Scholar, Department of Dravyagunavijnanam, Government Ayurveda College, Thiruvananthapuram.

Fig 1:-*Sida cordifolia Linn.*

Fig 2:-Root of *Sida cordifolia Linn.*

Preliminary Physical and Phytochemical Evaluation:-

The physical and preliminary phytochemical analysis was done by standard procedure mentioned in the Ayurvedic Pharmacopoeia of India[4]. Physical evaluation includes analysis of foreign matter, moisture content, volatile oil, total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive, fiber content and sugar content. Qualitative analysis was done for the presence of steroid, flavonoid, phenol, alkaloid, tannin and saponin. Thin Layer Chromatography and High Performance Thin Layer Chromatography were done to analyze the presence of chemical constituents in the drug. Atomic Absorption Spectroscopy was done to detect the presence of heavy metals.

Results:-

Results of physical evaluation:- The result of physical evaluation of root of *Sida cordifolia Linn*. is depicted in table no.1

Table No.1:-Physical evaluation of root of *Sida cordifolia Linn*.

Sl. No.	Experiment	Root
1.	Foreign matter (%)	Nil
2.	Moisture content (%)	10.02 %
3.	Volatile oil (%)	0.655 %
4.	Total ash (%)	1.550 %
5.	Acid insoluble ash (%)	0.689 %
6.	Water soluble extractive (%)	5.73 %
7.	Alcohol soluble extractive (%)	2.17 %
8.	Fiber content (%)	59.9 %
	Sugar content	
9.	Total sugar (%)	1.243 %
10.	Reducing sugar (%)	0.538 %

Results of Qualitative Analysis:-

The result of qualitative analysis of root of *Sida cordifolia Linn*. is given in table no.2

Table No.2:-Qualitative Analysis of root of *Sida cordifolia Linn*.

Sl. No	Test	*Sida cordifolia Linn.*
1.	Steroid	Present
2.	Flavonoid	Present
3.	Phenol	Absent
4.	Alkaloid	Present
5.	Tannin	Present
6.	Saponin	Present

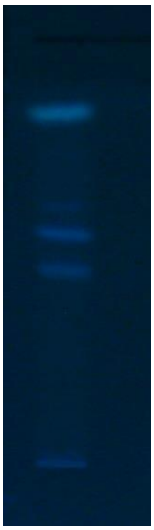
Chromatography:-
Different solvent systems were tested by trial and error method. The alcohol extract of *Sida cordifolia Linn.*showed best separation with Toluene: Chloroform: Ethanol as the solvent system in the ratio 28.5: 57: 14.5. The plate was viewed through UV fluorescence viewing cabinet (365 nm) and the Rf values of the spots were noted. Then the plates were kept in iodine chamber and no changes were noted. Rf values obtained are shown in table no.3

Table No.3:-Rf values of spots obtained in TLC

Solvent System	Drug	No. of Spots	Rf Value
Toluene: Chloroform: Ethanol (28.5: 57: 14.5)	*Sida cordifolia Linn.*	2	0.78 0.64

High Performance Thin Layer Chromatography:-
High Performance Thin Layer Chromatography of alcohol extract of *Sida cordifolia Linn.* was done using the solvent system Toluene:Ethyl Acetate:Acetic acid in the ratio 2:3:3 drops.

Fig 3:-HPTLC Plate at 366 nm



Atomic Absorption Spectroscopy:-
AAS was done to estimate the presence of heavy metals in the root of *Sida cordifolia Linn.*

Table 4:-Atomic Absorption Spectroscopy

Heavy metal Concentration in ppm	*Sida cordifolia Linn*
Lead	0.7864
Cadmium	0.0091
Iron	5.1240
Copper	0.0156

Discussion:-

Physical and phytochemical evaluation helped to assess the genuinity and to standardize the drug. This is useful in making use of genuine drug in medicinal preparations. TLC and HPTLC were done to identify the presence of chemical constituents in the drug. In TLC two peaks and in HPTLC one peak (Rf-0.59) was obtained. It is useful in confirming the identity of the drug. Qualitative analysis revealed the presence of steroid, flavonoid, alkaloid, tannin and saponin in the roots of *Sida cordifolia Linn.* These phytochemicals are the major contributors for the therapeutic activity of drugs. The alkaloid ephedrine present in the root of *Sida cordifolia Linn.* has proven to have anti-inflammatory activity. AAS showed that heavy metals like Lead, Cadmium, Iron and Copper were present within normal limits.Various extracts of the plant have already shown pharmacological properties like analgesic, diuretic,

tonic, antibacterial activity etc. Thus, phytochemical analysis of root of *Sida cordifolia Linn.* justifies its use in various Ayurvedic formulations for many ailments.

Conclusion:-

The plant *Bala* is a main ingredient in many of the Ayurvedic formulations. Though many botanical sources are used as *Bala*, the Ayurvedic Formulary of India suggests the use of *Sida cordifolia Linn.* as *Bala.* From the phytochemical evaluation of *Sida cordifolia Linn.* the drug showed the presence of steroid, flavonoid, alkaloid, tannin and saponin which may be responsible for its therapeutic actions.

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