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HPTLC Profiling and Ethnomedicinal Use of Leaf Extract of *Sida acuta* L.

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Abstract: *Sida acuta (Linn) is common wireweed undershrub flowering plant from Malvaceae family present in Poladpur taluka of Raigad District. The phytoconstituents present in leaf extract is carried out with the help of HPTLC fingerprint method.All parts of plant such as leaves, flower, stem, roots and are used as use traditionally in the form of extracts or powder by trible people of this area for treating various ailments such as cold and cough,stomach, dysentery, haemorrhoids, malaria, ulcers, renal inflammations, fever and asthmakidney, dandruff, rheumatism, liver problems,The Plant extractalso havingantibacterial, antifertility, anticonvulsant, antidepressant, aphrodisiac and various other pharmacological activities. Attempts have been made to study the preliminary analysis of leaf extract, ethnomedicinal use and complete profile of leaf extract by using high performance thin layer chromatography. The densitometric analysis shows fingerprinting, RF value, peaks of densitogram and chemical variation, this technique is useful for drug identification, adulteration and also acts as biomarker in plant industry.*

Keywords: Sida acuta (Linn.) Malvaceae family, HPTLC, ethnomedicinal use

I. INTRODUCTION

The peoples are aware about using chemical and synthetic medicines cosmetics and give more preference to use of herbal products. India recognize more than 2500 plants species which have medicinal value, However, large flora is waiting for their medicinal properties.(Kirtikar et.al.1995)·The use of medicinal plants as a source of medicine and human substances has been in vogue since antiquity India has rich heritage of use of plants as medicines and near about 805 medicines obtained from plants.

The Konkan region of Maharashtra comprises districts Raigad, Ratnagiri and Sindhudurg with a long coastline, it is also known from its beauty of sea, fruits such as mango, Jack fruits Coconut, Betel nuts orchards.The main range of sahyadri, spurs and valleys form important botanical pockets of high biodiversity. The north east and east stretches of sahyadri supports luxuriant growth of vegetation in Maharashtra state. The area has forest situated on its surrounding mountains. Sahyadri hills has a huge reservoir of enormous natural resources including vegetation wealth and traditional knowledge of medicinal plants The last two decades Pharmaceutical industry has made massive investment in research throughout the world to discover new drugs.Plants have effectively passed the taste of commercial screening. (Anonymous 2006). HPTLC plates provide improved resolution, higher detection sensitivity, and improved in situ quantification and are used for industrial pharmaceutical densitometric quantitative analysis.

Ethnomedical use: *2.3. Sida Acuta*

The ethnomedicinal usage of *S. acuta* (Sanskrit name: Balapatta) has been reported from among the ethnic tribes from many parts of India. The tribal population from north eastern and southern parts of India, have been extensively using different parts of the plant for treatment of liver problems dandruff, rheumatism, kidney stones, nervous disorders, testicular swelling and elephantitis. anti-helminthic, gastric disorders. Plant is also used by tribes of Tamil Nadu for treating bronchitis dysentery, diarrhoea and skin diseases. Besides India, other Asian,Central and South American (Mexico, Venezuela, Colombia, Cuba, Nicaragua, Guatemala) and African countries (Nigeria, Togo, Ivory Coast, Kenya) also use this ethnomedicinal plant for treating.(**Kirtikar et.al 1995).**

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Morphology of Plant: It is herb or under shrub, leaves covered with minute stellate and rigid hairs, Calyxaccrescent, mericarp mostly with two mucros, occasionally with awns, seedglaberous.

Material and methods: Preliminary phytochemical analysis of leaf extracts of *Sida acuta* (Linn) *is* done as per method described by (Wagner 1998), (Harborne1988) and Eike Reich 2006) HPTLC profiling was done by using CAMAG HPTLC System with WIN CATS software.

Collection of Plant material: The whole plant was collected from Poladpur taluka of Raigad district in the month of August 2020 and correctly identified with the flora of Kolhapur District (Dr S R Yadav) a herbarium was prepared and deposited in the department of Botany of Sundarrao More Arts commerce and Science College Poladpur Dist Raigad. The leaves were washed gently with running tap water to remove surface dust, pollutants and dried under the shade. The dried plant material was made of powder using a mixture grinder.

Extraction of Plant Material: About 10 gm. powder of *Sida acuta* (Linn) was extracted separately using 70% ethanol in a Soxhlet Extractor (Borosil) for about six hours. After extraction the extracts were evaporated to dryness. The dried extracts were dissolved in 5 ml ethanol and filtered using Whatman filter paper.**(Harborne J B**1988) The filtered extracts were later used for further phytochemical and HPTLC analysis wincats Planar Chromatography Manager. The sample of leaf extract of leaf extracts of *Sida acuta* (Linn) were filtered through the whatman filter paper No.1 and injected analysis. The Following peaks were obtained in fig No 2.The leaf extract of *Sida acuta* (Linn) showed peaks which contain alkaloids, non-protein amino acid (mimosine), flavonoids C-glycosides, sterols, terpenoids, tannins, and fatty acids etc.

Preliminary Phytochemical Analysis

Primary phytochemical analysis of ethanolic extract of *Sida acuta* (Linn) was done as follows.

Procedure for alkaloids: 2ml of extract is taken and added 2ml of Wagner's reagent, a brownish precipitate indicating the presence of alkaloids.

Cardiac glycosides: 2ml of extract is dissolved with 2ml of chloroform and concentrated sulphuric acid is carefully added to form a layer. Deep reddish brown colour at the interface of the steroid ring indicates the presence of cardiac glycosides.

Flavonoids: 2ml of extract is treated with 2 ml of 10%lead acetate. Yellowish green colour indicates the presence of flavonoids.

Saponins: 2ml of extract is dissolved with 2ml of Benedict's reagent. Blue black ppt indicates the presence of saponins.

Tannins: 2ml of extract is treated with 0.1% of ferric chloride. Brownish green indicates the presence of tannins.

Terpenoids: (Salkowski test) 2ml of extract is dissolved with 2ml of chloroform and concentrated sulphuric acid is carefully added to form a layer. A reddish brown colour indicates the presence of terpenoids.

Anthraquinones: 1ml of extract is boiled with 10% HCL for a few minutes in a water bath. It is filtered and allowed to cool. Equal volume of CHCl3 is added to the filtrate, a few drops of 10% Ammonia are added to the mixture and heat. Formation of rose pink colour indicates the presence of anthraquinones.

Glycosides: The extract is hydrolysed with HCL solution and neutralised with NaoH solution. A few drops of Fehling's solution B are added and red precipitate indicates the presence of glycosides.

Reducing sugars: The extract is shaken with distilled water and filtered. The filtrate is boiled with drops of Fehling's solution A&B for a few minutes. An orange red precipitate indicates the presence of reducing sugars.

Table 1: Different phytochemical compounds present in *Sida acuta* (Linn)

Sr No	Phytochemical compound	Present/Absent
1	Alkaloids	+
2	Mucilage and Saponins	-
3	Tannin	+
4	Cardiac Glycosides	-
5	Glycosides	-
6	Flavonoids	+

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7	Reducing Sugars	+
8	Fixed oils	+
9	Gums	-

(+) Indicates the presence of chemical constituents (-) indicates the absence of chemical constituents.

In the present research work preliminary phytochemical analysis of ethanol extracts of *Sida acuta* (Linn) Shows presence of Flavonoids, Tannin, Saponins, Alkaloid, Reducing Sugars and absence of Cardiac Glycosides, Glycosides, and Gums.

Table 2: RF Value of leaf extract of *Sida acuta* (Linn) Leaf at UV 254 nm.

Peak	Start Position	Start Height	Max position Rf	Max height	Max %	End Position	End Height	Area	Area %
1	-0.1Rf	6.0AU	0.01Rf	482.1AU	86.11%	0.04Rf	7.0AU	6166.2 AU	81.74%
2	0.19 Rf	0.7 AU	0.20Rf	12.4AU	2.22%	0.21Rf	0.1AU	86.8AU	1.15%
3	0.31 Rf	4.1AU	0.33Rf	22.7 AU	4.05%	0.35Rf	3.6AU	303.0AU	4.02%
4	0.64 Rf	10.3AU	0.65Rf	12.8AU	2.28%	0.69Rf	0.3AU	288.3AU	3.82%
5	0.78 Rf	0.0AU	0.81Rf	29.9AU	5.34%	0.85Rf	0.3AU	699.3AU	9.27%

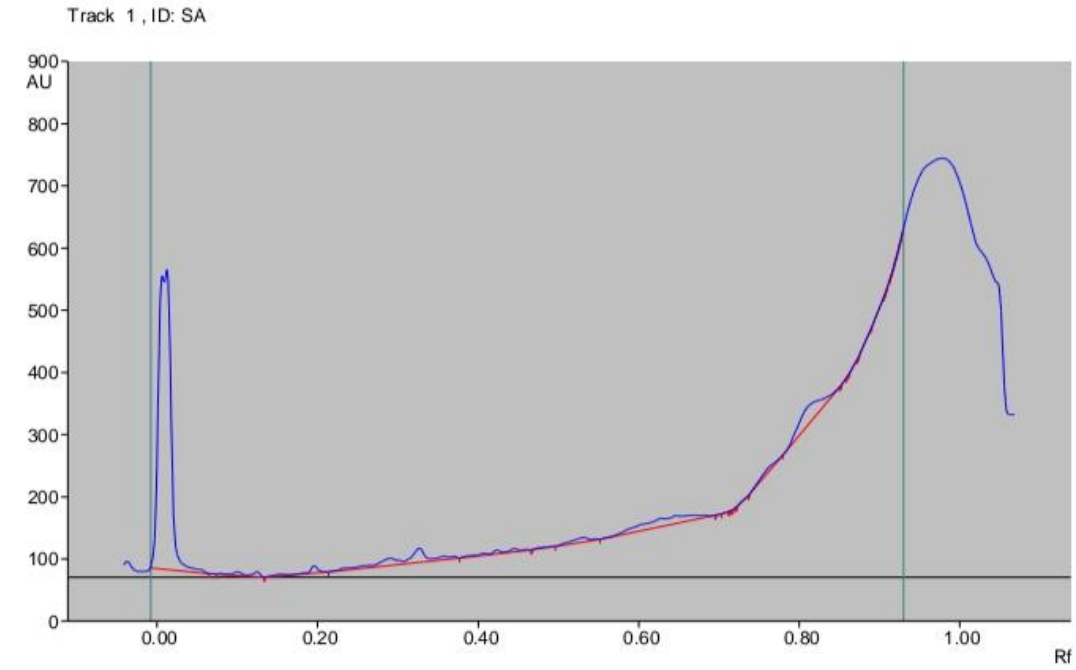

Fig .1 Chromatogram of*Sida acuta* (Linn) Leaf extract.

II. RESULT AND DISCUSSION

In the present study the photochemical components of alkaloids, steriods, flavonoids, phenols, terpenoids, and cardiac glycosides were present in the aqueous extract of *S. acuta*.

The HPTLC analysis obtained high resolution and shows different peak leaf extract of *Sida acuta* (Linn) was runs along with the standard and perceived to validate the presence of phytochemical compounds from chromatogram after

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derivatization. The result from HPTLC fingerprint scanned at wavelength 366 nm for *Sida acuta* (Linn) Shows polyvalent phytoconstituents and corresponding ascending order of Rf value are from -0.1to 0.78in which highest concentration of the phytoconstituents was found to be 85.63%.This is recorded in Table No.2 ethanol is used as a solvent Rf value and different wavelength were obtained in picture plate at UV254 nm. The graphical representation shows different peaks of polyvalent phytoconstituents.

The Rf value starts from -0.01 to 0.78 in which highest concentration of phytoconstituents were found and maximum percentage starts from 85.63 to 4.23, area 81% to 6.21% and maximum height from 625.7AU to 30.9 AU control. The peak retention in ethanol extracts and is found with Rf start with -0.1,0.5 ,0.08 ,0.30 ,0.51, 0.78and end with .04,0.08,0.14,0.33,0.56,0.85, and maximum percentage is 85.63%,2.39%,1.62%,3.42%,2.70%,4.23% in Table no. 2..These studies have shown that it is more versatile than ordinary TLC methods as the spots are well resolved. The HPTLC method is simple, rapid, accurate, reproducible, selective and economical for quality and quantitative determination of plant material.(Khandelwal KR 2005)

III. CONCLUSION

The study of HPTLC fingerprints profile of *Sida acuta* (Linn) useful to determine the quality of crude drug and also useful for separation of secondary metabolites (Hung et.al 2012).The antiasthmatic, aphrodisiac, analgesic, and antidepressant, sedative, emetic, alopecia, diarrhoea, dysentery, insomnia, tumour, and various urogenital infections can be attributed to their high alkaloids, proteins, amino acids, tannins, phenolic, flavonoids, steroids and alkaloids, flavonoids glycosides, amino acids, tannins, saponins, etc. Hence in future it will be aimed to isolate the alkaloidal compounds from methanolic fraction and to screen their pharmacological activities in in vitro and in vivo models.

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