Preliminary Phytochemical Analysis of *Alternanthera sessilis Leaves (*Linn*)*. R.Br. ex DC.

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ABSTRACT

Alternanthera sessilis (Linn). R. Br. ex DC. is a treasure house of phytochemicals belongs to family Amaranthaceae, popularly known as stalkless joy weed, sessile joy weed, dwarf copperleaf, joy weed, Garundi, Guroo, Kanchari. The ability of its seeds to germinate in any season of the year makes it a constantly flourishing component of the vegetation. The main objective of current investigation was to study the qualitatively preliminary phytochemical analysis of such weed species. The fresh plant leaves of *Alternanthera sessilis* were screened to understand the phytochemical potential with the use of four extracts such as aqueous, acetone, methanol and ethanol. The outcome of the study indicates that the fresh plant contains different classes of secondary metabolites such as alkaloids, carbohydrates, cardiac-glycosides, flavonoids, phenols, saponins, tannins, terpenoids, quinones, coumarins etc. Phytochemical are certain non-nutritive plant chemicals which have allelopathic properties. These phytochemical constituents play an important role in formulation of pharmaceutical and pharmacological drugs.

Key words: *Alternanthera sessilis*, solvent extract, phytochemicals, Pharmaceuticals, Pharmacological drugs, Sangli district.

INTRODUCTION:

Weeds are unwanted plant grows in a place where some other plants are also growing or no other plant has to grow at all. Weeds are unwanted, harmful, dangerous or economically detrimental. Weeds are found common in both kharip and rabbi season [14]. Weed flora of Sangli district is very rich with family Asteraceae and Poaceae [2]. The genus A*lternanthera* is an important representative of the family Amaranthaceae [3]. It is a cosmopolitian family consisting of 64 genera and about 800 species, mostly abundant in tropical regions of America, Africa and India [6] and [7]. It is an annual or perennial herb 0.2-1m high, with strong taproots. The leaves are simple, opposite, shortly petiolate or sessile, broadly lanceolate or spatulate to almost linear, 0.6-5cm long, and 0.3-1cm wide. They are attenuate at the base, and the apex is acute blunt, with entire, glabrous or pilose (thin, fine, articulate hairs) margins. The inflorescence are dense, sessile, silvery-white clusters of compressed spikes in the leaf axils; perianth segments are equal in length, acute, 1.5-2.5mm long with a short point. Bracts are ovate, concave, 0.3-1mmlong and persistent; bracteoles are oblong-ovate, 1-1.5mm long, may be acute, and not deeply lacerated. Sepals are 2-3mm long, white or purplish, glossy with a

green base, glabrous or with a few long hairs, and a strong midrib. The fruits are indehiscent, a small, flattened, obcordate or obovate utricle, 2-2.5 mm long, enclosing the seed. Seeds are dark-brown to black, disc-shaped and shiny, about 0.8-1mm in diameter. They are light sensitive [12-16]. A decoction is recommended as an herbal remedy to treat wounds, flatulence, nausea, vomiting, cough, bronchitis, diarrhea, curative, protective or promote purposes. *A. sessilis* is used as a local medicine often in mixtures with other medicinal plants, to treat hepatitis, tight chest, bronchitis, asthma and other lung troubles. The leaves and shoots boiled and drunk as an antihypertensive remedy [17].

The major objective of the investigation is to study the qualitative status of different phytochemicals in four different extracts of the selected indigenous weed *A. sessile.*

MATERIAL AND METHODS:

Collection of samples:

The fresh plant leaves of *Alternanthera sessilis* were collected from natural habitats from some fields near by localities of Sangli district, Maharashtra, India in August 2021. The plant was authenticated at the Department of Botany, Sadguru Gadage Maharaj College, Karad, (Maharashtra). A herbarium was prepared and kept for future reference. The leaves were collected and washed thoroughly 3-4 times with running tap water and properly dried under shade for 3-5 days in an airy space. The dried leaves were ground to fine powder with the help of electric grinder [4]. The ground plant samples were powdered and stored in dry glass container and in polythene bags for further analysis [15-8].

Preparation of extracts:

The plant leaves were collected and washed thoroughly 3-4 times with running tap water and shade dried for 3 -5 days. periodically the moisture level of the leaves was observed. once it is completely dried using electric grinder, the plant leaves were powdered [1]. 2 grams of the dried powder of *Alternanthera sessilis* (Linn) R. Br. ex DC leaves placed in four separate round bottom flask for sample extraction using four solvents namely aqueous, acetone, ethanol and methanol. The extraction was conducted with 20 ml of each solvents for period of 48 hrs. At the end of the extraction, the respective solvents were concentrated under reduced pressure and the crude extracts were stored in air tight containers at 4-5° C aseptically in refrigerator for the further use[11].

Phytochemical analysis:

Phytochemical screening is the method of finding the main class of chemical compounds present in the plant extract [10]. Preliminary phytochemical screening was performed to understand the qualitative status of the tested weed plant for various compounds such as alkaloids, carbohydrates, cardiac glycosides, flavonoids, phenols, amino acids/proteins, saponins, tannins, terpenoids, quinones, coumarins etc. These compounds are known as secondary metabolites, which determines the medicinal potential of the plant species. As per the literature available, the different chemical tests were carried out to know the presence or absence of the secondary metabolites [9].

Test for Alkaloids (Wagner's test)

1 ml of plant extract was taken and added 3 – 5 drops of Wagner's reagent [1.27g of iodine and 2g of potassium iodide in 100 ml of water] and observed for the formation of reddish-brown precipitate or coloration indicated the presence of alkaloids.

Test for carbohydrates (Molisch's test)

1 ml of plant extract was taken and added 3 - 5 drops of Molisch's reagent, along with this added 1 ml of conc. Sulphuric acid (H_2SO_4) down the side of the test tube. Then allowed the mixture to stand for 2 - 3 min. It was observed red or dull violet color at the interface of the two layers which indicates the presence of carbohydrates [15].

Test for Cardiac glycosides (Keller Killiani Test)

1 ml extracts was taken and treated it with 1 ml of glacial acetic acid and 2 – 3 drops of 5 % ferric chloride solution. This was under layered with 1 ml. of conc. sulphuric acid. Observed a brown ring at the interface shows the presence of deoxy sugar characterstics of cardenolides. A violet ring was appeared below the ring while in the acetic acid layer, resulted information of greenish ring [8].

Test for Flavonoids (Alkaline reagent test)

1 ml of extract was taken and treated it with 3 – 5 drops of 20 % NaOH solution. It was observed for the formation of intense yellow color which becomes colorless on addition of 0.5 ml Dil. HCL indicated the presence of flavonoids [1].

Test for phenols (ferric chloride test)

2 ml of distilled water followed by few drops of 10%ferric chloride was added to 1ml of the extract. Formation of blue or green color indicated the presence of phenols.

Test for Amino acid and Proteins (1% ninhydrin solution in Acetone)

Take 1ml of extract and add 2-5 drops of aqueous ninhydrine solution and keep it in a boiling water bath for 1-2 min and observe for the formation of purple color.

Test for Saponins (foam test)

1 ml of extract was taken and added to water and shaken well. vigorously. Observed for the formation of honey comb like foam for 10 – 15 min. indicated the presence of Saponins.

Test for Tannins (Braymer's test)

1 ml of extract was taken and treated it with 1 ml of 10% alcoholic ferric chloride solution and observed for the formation of blue or greenish color indicated the presence of tannins [12].

Test for Terpenoids (Salkowski test)

1 ml of extract was treated it with and 0.5 ml of conc. HCL and observed for the formation of yell ow precipitate or coloration. indicated the presence of terpenoids [3] .

Test for Quinones

1 ml of extract was taken and added 5ml distilled water and observed the turbidity indicated the presence of quinones.

Test for Coumarins

1ml of extract was taken and added 1.5 ml of 10% NaOH. It was observed the formation of yellow color indicated the presence of coumarins [18].

RESULTS AND DISCUSSION

Table1.

Phytochemical constituents of *Alternanthera sessilis* (Linn) R.Br.ex DC.

Sr. No	Phytoconstituents	Aqueous Extract	Acetone Extract	Methanol Extract	Ethanol Extract
1	Alkaloids	+++	+++	+++	+++
2	Carbohydrates	---	---	+++	---
3	Cardiac glycosides	---	+++	+++	+++
4	Flavonoids	+++	+++	+++	+++
5	Phenols	---	---	---	---
6	Amino acids /proteins	---	---	---	---
7	Saponins	---	---	+++	---
8	Tannins	+++	+++	+++	+++
9	Terpenoids	+++	---	+++	+++
10	Quinones	+++	+++	+++	+++
11	Coumarins	+++	+++	---	+++

Positive +++, Negative ---

Phytochemical analysis was performed qualitatively to analyse the presence of various phytoconstituents in the different leaf extracts of the powdered plant. In the present study, the phytochemical analysis of *Alternanthera sessilis* shown in table 1 indicates the presence of alkaloids, flavonoids, quinones in all extracts used. i.e. aqueous, acetone, ethanol, methanol. cardiac glycosides, terpenoids, coumarins were moderately found in some extract acetone, ethanol, methanol, aqueous. Tannins were found in aqueous and methanol extract and absent in acetone and ethanol extract while amino acids /proteins absent in all extracts. Carbohydrates were only found in methanol extract except aqueous, acetone ethanol saponins are absent in all extract except methanol and phenols absent in all extract except ethanol. The observation made during investigation are in close agreement with the earlier works carried out in different species of weeds [6]. [14] suggested that the tested plant provide natural chemicals that have high good medicinal value for diabetes and other health concerns. The presence of flavonoid

and tannins have antiviral, antifungal, anti-inflammatory and cytotoxic property [5]. In general of the documentation the plant shows antimicrobial, anti-inflammatory, antifungal, antibacterial, anti-hyperglycemic, antioxidant, antipyretic, hepato-protective activity ,hematic activity, antiulcer activity, hypoglycemic, anti-diarrhoeal property etc [19]. Results of our study further confirms the presence of different phytochemicals possess a wide range of activities which may help in protectives against chronic diseases such as alkaloids protect against chronic diseases , saponins protects against hypercholesterolemia and antibiotic properties . Terpenoids shows the analgesic properties [16]. The pharmaceutical industries are mainly focused towards design and development of new innovative /indigenous plant based drug through investigation of leads from traditional system of medicine [13].

Conclusion:

From the results of the study, it could be concluded that the tested plant *Alternanthera sessilis* contain bioactive components specifically in the ethanolic extract of the leaves. The phytochemical screening study established a significant scope to develop a broad spectrum use of tested weed plant in herbal medicine and a base for the development of novel potent drugs and phyto medicine. This investigation may focus research field to develop clinical studies which might be of great scientific contribution for the society.

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