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PRELIMINARY PHYTOCHEMICAL ANALYSIS OF THE ETHANOLIC EXTRACT OF SWEET LOTUS (*Glinus lotoides* L).

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RESEARCH ARTICLE

ABSTRACT

The main objectives of this study are to find out the presence of major phytochemical constituents in Glinus lotoides L. The standard methods were used to carry out the analysis of phytochemical constituents present in the plant. The plant found to contain carbohydrates, proteins, alkaloids, tannins, flavonoids, terpenes, anthraquinones, saponins and coumarins. Powder microscopy of whole plant showed trichomes, epidermal hair, pitted vessels, tracheid's, needle shaped calcium oxalate crystals, fibres, vessel elements etc. TLC analysis of the ethanolic extract of whole plant revealed spots in visible light, UV light and iodine chamber. The extract was run along with alkaloid standard and the presence of alkaloid was confirmed. Alkaloids are secondary metabolites with enumerable pharmacological activities so the study open a way for further research in alkaloids in Glinus lotoides L. which might result in the discovery of new drugs.

Keywords: *Glinus lotoides* L., Phytoconstituents, TLC.

INTRODUCTION

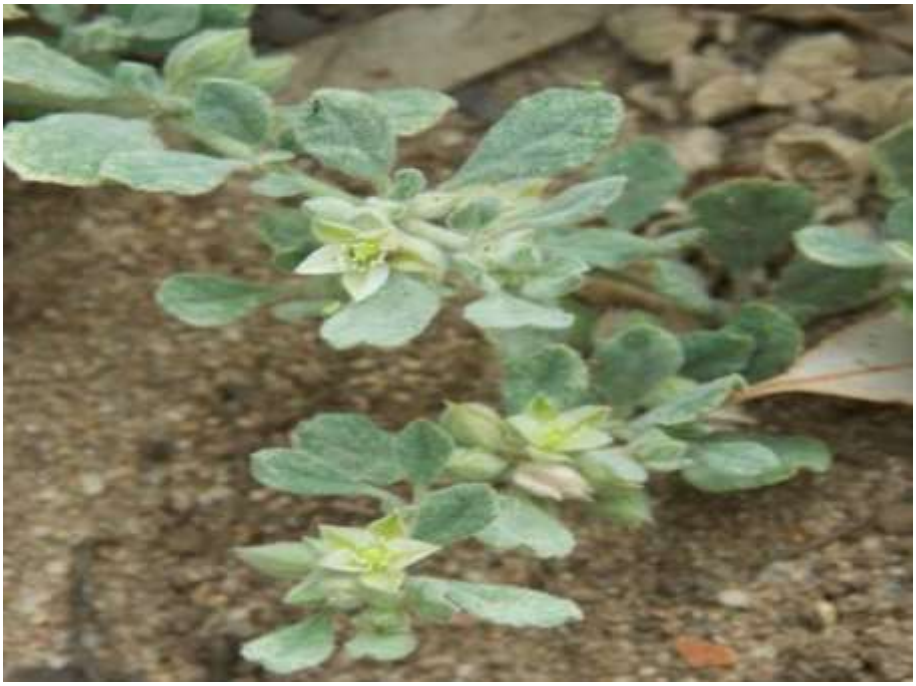
The biodiversity of India has been known worldwide. Our flora and fauna are rich source of various medicinal preparations, many of which has yet to be explored. Herbs, especially weeds become a popular area of research in order to discover new secondary metabolites of therapeutic application. Plant based drugs are more natural, less toxic and can be easily procured for the manufacture of medicines.

Glinus lotoides L. is a short living perennial prostrate weed spread throughout tropical and subtropical regions of the world. India, Ethiopia, Sudan, Uganda, Egypt, Pakistan and South Africa constitute a lion share of the habitat of *Glinus lotoides* L. The plant is commonly called as carpet weed belongs to family Molluginaceae. Phytochemicals - fatty acids, glycosides of sitosterol and sigma sterol, flavonoids and waxes were present in this plant. Ascorbic acid found in the plant plays a major role in growth and metabolism. Most of the primary metabolites found in the plant act as precursors of pharmacologically active compound. The seeds of *Glinus lotoides* L. found to contain saponins, glinnusides F, G, H succulentoside, flavones, vicenin, -2, vintexin-2-O-glucoside (Endale

et al., 2005). The plant extract contains fatty acids, glycosides of sitosterol, stigmasterol, flavanoid and wax (Adline *et al.*,2015). The bioactive compounds present in the plant extract are found to be anti-helminthic (Dema *et al.*,2006), wound healing (Rameshwari *et al.*,2013), anti-spasmodic, anti-tumour, molluscicide, bioherbicide and antidiabetic.

Although the presence of primary and secondary metabolites of *Glinus lotoides* L. are reported as a part of several pharmacological studies, the occurrence of the alkaloids in the ethanolic extract of plant was found to be scarce. Thus, the present study is an endeavour to explore and obtain more information about the phytochemical significance of the plant.

Glinus lotoides L.



MATERIAL AND METHODS

Glinus lotoides L. was collected from Pimpri Gaon and the plant was authenticated by Botanical Survey of India Western Circle Pune 41101. The voucher number is BSI/WRC/Cert./2014. Preliminary phytochemical analysis was carried out using ethanolic extract of the pulverized plant material obtained through cold maceration. Phytochemical screening of the primary and secondary metabolites was done using standard chemicals and procedures (Harborne, 1998).

TLC plates were prepared by coating the glass plates with silica gel G_{60} F_{254} for preliminary analysis. The solvent system used for TLC was n-Hexane and Acetone (8:2). The chromatography chamber was poured with 20 ml of solvent system and allow to saturate for 30 minutes. The TLC plates were loaded with ethanolic extract of plant, run along with standard in the solvent system till the solvent front reached up to 10 cm. The TLC plates were observed under UV light, visible light and in iodine chamber. The fluorescent spots were recorded in UV light and RF values were calculated. The plate was then placed in a hot air oven at 120ºC till the colour developed and the RF values of the spots were recorded in the visible light. The dried TLC plates were placed in the iodine chamber to observe the colour of the spots and the RF values were noted. Derivatization was done with anisaldehyde and sulphuric acid reagent.

RESULT AND DISCUSSION

The microscopic examination of greenish powder of *Glinus lotoides* L. showed the presence of trichomes, epidermal hairs, pitted vessels, tracheid, needle shaped crystals, fibres and vessel elements. Foreign matter obtained was 34.2%, total ash 9.59%, acid insoluble ash 1.48%, alcohol soluble extract 16.57%, water soluble extract 14.21% and loss on drying at 110 ºC 6.91%. The qualitative analysis of ethanolic extract of the plant indicated the presence of primary metabolites – carbohydrates, proteins, fats and oil and secondary metabolites – alkaloids, tannins, flavonoids, terpenes, anthraquinones, saponins and coumarins.

The TLC analysis of ethanolic plant extract showed clear spots in visible light of RF values 0.93, 0.53, 0.32 of yellow, green and yellow colour respectively. Four pink spots were obtained in UV light 365 nm of RF values 0.92, 0.66, 0.53 and 0.32. The TLC plate placed in iodine chamber showed yellow spots of RF values 0.92, 0.66, 0.53, 0.32 and 0.20 respectively. The derivatization with anisaldehyde and sulphuric acid showed grey spots of RF values 0.93, 0.66, 0.53 and 0.32. TLC plates were run with plant extract along with standard. The extract showed the spot of RF value 0.66 which was same as that of the standard. Thus, the presence of alkaloid in the ethanolic plant extract was confirmed. Thus, TLC of ethanol plant extract of *Glinus lotoides* L. in solvent system n Hexane and Acetone (8:2) can be used for the isolation of alkaloid in future investigation.

Table 1- Data of the TLC analysis of ethanolic extract of *Glinus lotoides* L.

Sample	UV Light			Visible Light			Iodine Chamber		
	Spot	RF value	Colour	Spot	RF value	Colour	Spot	RF value	Colour
Standard (Caffeine)	-	-	-	1.	0.66	yellow	1.	0.66	yellow
Sample (Ethanolic Plant Extract)	1. 2. 3. 4.	0.92 0.66 0.53 0.32	Pink Pink Pink Pink	1. 2. 3.	0.93 0.53 0.32	Yellow Yellow Yellow	1. 2. 3. 4. 5.	0.92 0.66 0.53 0.32 0.20	Yellow Yellow Yellow Yellow Yellow

TLC plates of ethanolic plant extract of *Glinus lotoides* L.

a) UV light b) Visible light c) Iodine chamber

Awan *et al.,* 2022 reported that ethanolic extract of *Glinus lotoides* L. plays a protective role against depression by modulating antioxidant enzymes. The study revealed the ocurance of gallic acid, quercetin, chlorogenic acid and caffeic acid. The ethanolic extract of the plant showed anti-depressant activity and this support the use in traditional system of medicine, Ayurveda and Unani formulations. The presence of alkaloid caffein was confirmed through TLC in the present study. Subramani *et al.,* 2015 reviewed *Glinus lotoides* L. and pointed out the occurrence of saponins, flavonoids, sapogenins like mollugenins. Our study also revealed the presence of flavonoids, alkaloids, saponins and tannins in the plant. An in-depth study of the pharmacological application of the alkaloid present in the plant should be carried out to discover new drugs.

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