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Phytochemical and Antimicrobial Studies of Whole Plants of Talinum fruticosum L.

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ABSTRACT

Talinum fruticosum.L (Talinaceae) is a erect, stout, fleshy, perennial herb. It is used as a leaf vegetable. It contain rich in vitamins including vitamin A and C and minerals such as iron and calcium. The present work highlights phytochemical and antimicrobial studies of Talinum fruticosum. The whole plant were collected from Kasaragod district and subjected to successive solvent extraction. The next step the various extracts of the plant were tried to phytochemical screening. The phytochemical screening shows the presence of flavonoids glycosides carbohydrates and protein. the chloroform and methanolic extracts were subjected to phytochemical screening. The chloroform extract shown the activity against gram positive organism. The phytoconstituents like flavonoids, glycosides are responsible for this activity. The phytochemical studies gave confirmation of the above said result.

Keyword: *Talinum fruticosum. L*, phytochemical, antibacterial

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INTRODUCTION

Medicinal plant constitutes of a very important resources of indigenous medicinal system for the last 300 years. Moreover the increasing the use of the plant extracts in the food, cosmetics, and pharmaceutical industries suggests that in order to find out the active ingredient various methods are employed and utilized the plants for medicinal purpose. Antimicrobial agents are one of the potent class of medicinal compounds in which studies were conducted. *Talinum fruticosum.L*(Talinaceae) is a erect, stout, fleshy, perennial herb used as a leaf vegetable. It contain rich in vitamins including vitamin A and C and minerals such as iron and calcium. The present work highlights phytochemical and antimicrobial studies of Talinum fruticosum[1,2]

Figure 1 *Talinum fruticosum.L*

METHODOLOGY

Collection:

The whole plant of *Talinum fruticosum.L* was collected from Kasaragod and dried and powdered

Extraction:

Extraction of the dried powder of the leaves of *Talinum fruticosum* was carried out by successive solvent extraction using solvents of increasing polarity viz. petroleum ether, chloroform, ethyl acetate, methanol and water. around 2grams of the leaves were weighed, moistened with respective solvent and packed in the soxhlet extractor and was then extracted with 500ml each of the petroleum ether, chloroform, ethyl acetate, methanol and water .After each extraction, the same dried marc was used for the subsequent extraction. Each extract was then filtered, the solvent distilled off and finally the dried extract was obtained.[6]

Preliminary Phytochemical Screening[3]*:*

Various chemical tests were carried out using the extract was performed for identify the presence of alkaloids, glycosides, phenolic and flavonoids, flavonones, terpenoids and sterols.

Antibacterial screening by Kirby Bauer method[9, 10]

Mueller Hinton agar plates were prepared aseptically to get a thickness of 5-6mm.the plates were allowed to solidify and inverted to prevent the condensate falling on the agar surface. The plates were dried at 37^{o}C before inoculation. The organism was inoculated in the plates prepared earlier, by dipping a sterile swab in the previously standardized inoculum, removing the excess of inoculum by pressing and rotating the swab firmly against the sides of the culture tube above the level of the liquid and finally streaking the swab all over the surface of the medium 3 times, rotating the plates through angle of plate 60^{o}after each application. Finally the swab was pressed round the edge of the agar surface. It was allowed to dry at room temperature with lid closed. The sterile disc containing the drugs, standard and blank were placed on the previously incubated surface of the Mueller Hinton agar plate and it was kept in the refrigerator for one hour to facilitate uniform diffusion of the drugs. Plates were prepared in triplicate and they were then incubated for 18-24 hours at 37^{o}C. Observations were made for zone of inhibition around the drugs and compared with that of standard.

RESULTS AND DISSCUSION

Successive solvent extraction method was done using petroleum ether, chloroform, acetone, ethyl acetate, methanol and water. The characteristics of extracts shown in the table no:3

Table.3: Extracts characteristics

Sl no	Solvent used for extraction	colour	Consistency	Percentage yield(%w/w)
1	Petroleum ether	Dark green	Semisolid	11.45
2	Ethyl acetate	Dark green	Semisolid	05.50
3	chloroform	Dark green	Semisolid	08.45
4	Methanol	Dark green	Semisolid	12.25
5	water	Black	soild	51.35

Preliminary phytochemical screening

Table 4: Results of Preliminary phytochemical screening of different extracts of the plant.

Sl no:	Phytoconstituents test/Reagents used	Peteter extract	Chloroform extract	Ethylacetate extract	Methanol extract	Aqueous extract
1	Alkaloids	-	-	-	-	-
2	Glycosides	-	-	-	-	+
3	Phenolic Compounds	-	-	-	+	++
4	Flavones & Flavonoids	-	+	+	+	++
5	Carbohydrates	-	+	++	+	+
6	Proteins	-	-	-	+	-
7	Terpenoids	+ +	+	+	+	+
8	Sterols	+	-	+		
9	Saponins	-	-	++	+	+
10	Gum & Mucillages	-	-	-	-	-
11	Volatile Oil	-	-	-	-	-

Antibacterial activity:

The extracts were subjected to antimicrobial activity using different bacterial strains by agar well diffusion method. The methanolic and ethyl acetate extracts were shown significant antibacterial properties. The results are shown in the table no:6 and figure no:2,3

Table 6 Zone of inhibition in bacterial strains

Sl no	Extracts	Diameter of zone of inhibition in mm (100µg/disc)							
		Stephylococcus aureus				*Escherichia coli*			
		100	200	300	400	100	200	300	400
1	Stnandard(5µg)	24	25	25	24	24	25	25	24
2	control	0	0	0	0	0	0	0	0
3	methanol	0	0	0	0	0	0	0	0
4	chloroform	12	13	16	18	0	0	0	0

(-) indicates no zone of inhibition,

(Diameter of zone of inhibition:17 mm & above: Sensitive, 13-16mm: Moderately sensitive, <12 mm: resistant).

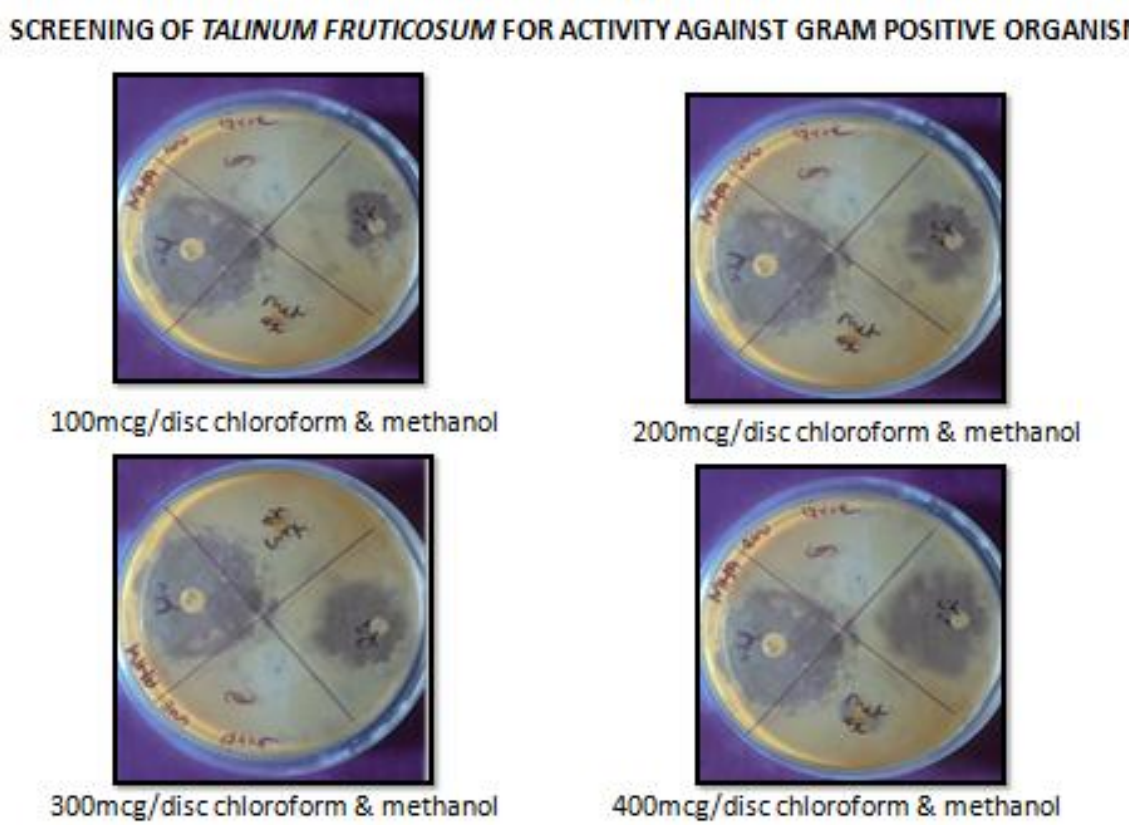

Fig.2 Zone of inhibition of the *Talinum fruticosum* against Staphylococcus aureusNCIM2027

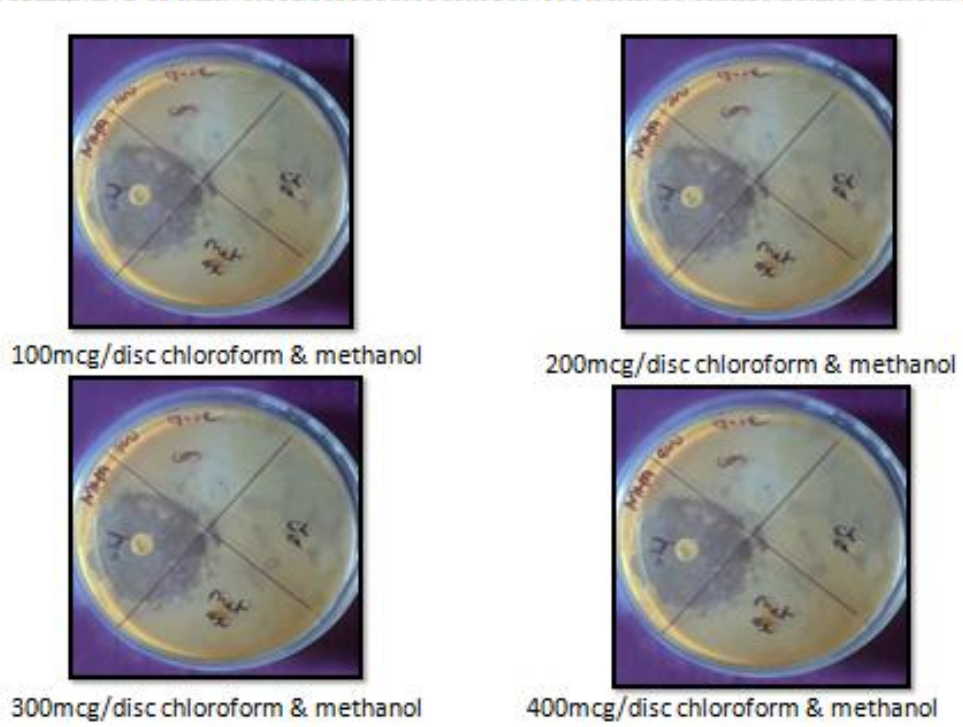

Fig.3 Zone of inhibition of the *Talinum fruticosum* against Esherichia coli NCIM2027

CONCLUSION

The whole plant of *Talinum fruticosum* were collected, authentified, dried and subject to successive solvent extraction using pet ether , chloroform, ethyl acetate, methanol and water as per standard procedure.These extract were used for phytochemical studies. The extract showed the presence of glycoside, flavonoids and carbohydrate. The chloroform and methanol extract was then subjected to antimicrobial studies. The chloroform extract was found to be effective against gram positive microorganism. The inhibition may be due to Glycosides and flavonoids. The compound responsible for the antimicrobial activity can be confirmed only after isolating the active constituent in the extract.

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