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## IN-VITRO ANTI INFLAMMATORY STUDIES ON WHOLE PLANT OF *UTRICULARIA RETICULATA*

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### ABSTRACT

Inflammation is a defense phenomenon yet often leading to serious pathological conditions. From ancient days human used the traditional medicinal plants as anti-inflammatory agent. "*Utricularia reticulata*" is such a plant which is used by the tribes for the treatments of ulcers, wound healing, and neutralizing venoms of snakes, spiders, eye diseases. The study highlights the anti-inflammatory studies of the plant thereby increasing the utilization of this commonly available plant for its medicinal property. The whole plants were collected, dried and subjected to successive solvent extraction. The phytochemical screening were carried out. Further the extracts were tried for anti-inflammatory studies. Chloroform and acetone extracts were shown significant anti-inflammatory properties. In spite of the data revealed from phytochemical screening and literature survey the phytoconstituents like alkaloids, glycosides, phenolic and flavonoids, flavonones, terpenoids and sterols present in the plant were responsible for the activities.

**Keywords:** *Utricularia reticulata*, antioxidant, antibacterial.

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### INTRODUCTION

Inflammation is a defense phenomenon yet often leading to serious pathological conditions. From ancient days human used the traditional medicinal plants as anti-inflammatory agent. People who are traditional remedies may not understand the scientific rationale behind their medicines but they know from personal experience that some medicinal plants are highly effective if used at therapeutic dose. The plant (fig-1) "*Utricularia reticulata*" which is used by the tribes of Sri Lanka and India for the treatments of

Ulcers, wound healing, and neutralizing venoms of snakes, spiders, eye diseases. It is a medium to large sized probably annual carnivorous plant grows in marshy grasslands or wet soil over rocks at lower altitudes up to 750 m. It is a common weed found in rural field. The present study highlights the anti-inflammatory studies of the plant thereby increasing the utilization of this commonly available plant for its medicinal property (1, 2)



**Fig-1** *Utricularia reticulata*

**MATERIALS AND METHODS****Collection**

The whole plant of *Utricularia reticulata* was collected from Kasaragod and dried and powdered

**Extraction**

Successive solvent extraction of whole plant using solvents of increasing polarity viz. petroleum ether, chloroform, acetone, ethyl acetate, methanol, water (5).

**Preliminary Phytochemical Screening (3, 4, 6)**

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.

**In-Vitro Anti- Inflammatory studies (7-9)****Protein Denaturation**

5ml 0.2% w/v bovine serum albumin in Tris HCl buffer saline and different concentrations of extracts in methanol were taken in test tubes and heated at 72°C for 5 minutes, cooled for 10 minutes. The absorbance of these solutions was determined at 660nm. The experiment repeated with standard (*Ibuprofen*) also. The IC<sub>50</sub> was calculated and compared with standard.

**Proteinase Inhibitory Action**

The reaction mixtures (2ml) contained 0.06 mg trypsin, 1ml 25mM Tris HCl buffer (pH7.4) and 1ml aqueous solution of plant extracts of different concentration (100,200,300,400,500µg/ml). The mixtures were incubated at 37°C for 5min. Then 1ml of 0.8%(w/v) casein was added. The mixtures were incubated for an additional 20 minutes. Then 2ml of 70 % ( w/v) perchloric acid was added to terminate the reaction. The cloudy suspension was centrifuged. Absorbance of the supernatant was read at 280nm against buffer as blank. IC<sub>50</sub> was calculated and compared with standard (*Ibuprofen*).

**RESULTS AND DISCUSSION****Extraction**

Successive solvent extraction method was done using petroleum ether, chloroform, acetone, ethyl acetate, methanol and water.

The characteristics of extracts shown in the table-1.

**Table-1 Extracts characteristics**

S. no	Solvent used for extraction	Colour	Consistency	Percentage yield(%w/w)
1	Petroleum ether	yellow	Semisolid	8.75
2	Chloroform	Greenish yellow	Semisolid	15.3
3	Acetone	Pale yellow	Semisolid	13.8
4	Ethyl acetate	Pale yellow	Semisolid	10.5
5	Methanol	Yellow Brown	Semisolid	12.9
6	Aqueous	yellow	Solid	23.5

**Preliminary phytochemical screening**

Preliminary phytochemical screening of different extracts of the plant was carried out and results are shown in the table-2.

**Table-2 Results of Preliminary phytochemical screening of different extracts of the plant**

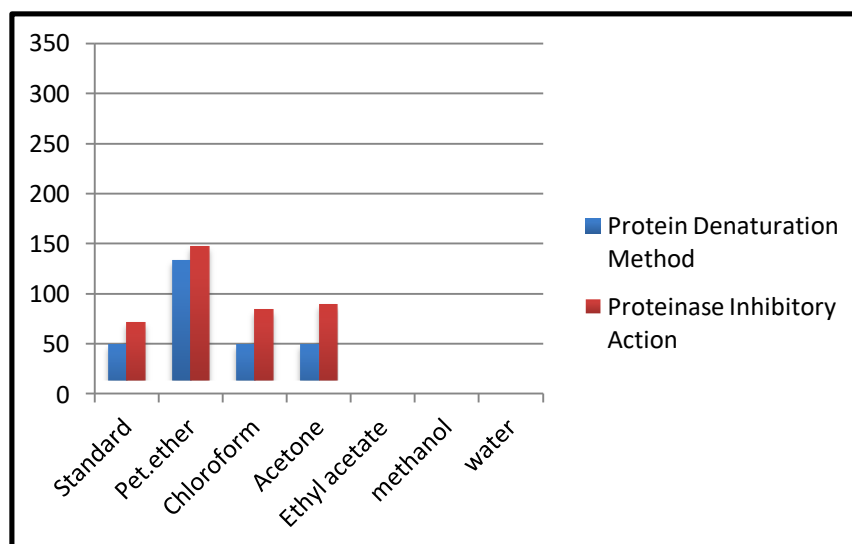
s. no	Phytoconstituents test/Reagents used	Pet.ether extract	Chloroform extract	Acetone extract	Ethyl acetate extract	Methanol extract	Aqueous extract
1	Alkaloids	-	+	++	-	-	-
2	Glycosides	-	+	+	+		-
3	Phenolic Compounds	-	++	++	+	+	++
4	Flavones & Flavonoids	-	+	++	++	+	++
5	Carbohydrates	-	+	++	++	+	+
6	Proteins	-	++	-	-	-	-
7	Terpenoids	+	++	++	+	+	+
8	Sterols	+	-	-	+	-	-
9	Saponins	-	-	-	++	+	+
10	Gum & Mucillages	-	-	-	-	-	-
11	Volatile Oil	-	-	-	-	-	-

**Anti- Inflammatory studies**

The anti- inflammatory studies of whole plants were carried out and the IC<sub>50</sub> Values of each extracts was calculated and tabulated (table-3) below and compared with standard.

**Table-3 Antiinflammatory studies on various extracts on *Utricularia reticulata***

S. No	Extract/ Standard	IC <sub>50</sub> Values (mcg/ml)	
		Protein Denaturation Method	Proteinase Inhibitory Action
1	Standard( <i>Ibuprofen</i> )	50	72
2	Pet. ether extract	134	147
3	Chloroform extract	50	84
4	Acetone extract	50	89
4	Ethyl acetate extract	100	119
5	Methanol extract	122	316
6	Aqueous extract	100	287



**Fig-2 Graphical representation of antiinflammatory studies on various extracts on *Utricularia reticulata***

The anti inflammatory activities by inhibition of protein denaturation and proteinase inhibitory assay showed chloroform and acetone extracts possess potent anti inflammatory activity (Fig-2).

#### CONCLUSION

“*Utricularia reticulata*” is a medium to large sized probably annual carnivorous plant which is used by the tribes for the treatments of ulcers, wound healing, and neutralizing venoms of snakes, spiders, eye diseases. Hence the whole plants of *Utricularia reticulata* were collected dried and subjected to extraction. The whole plants were collected, dried and subjected to successive solvent extraction. The phytochemical screening were carried out. Further the extracts were tried for anti inflammatory studies. Chloroform and acetone extracts were shown significant anti inflammatory properties. In spite of the data revealed from phytochemical screening and literature survey the phytoconstituents like alkaloids, glycosides, phenolic and flavonoids, terpenoids and sterols present in the plant were responsible for the activities.

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