

ORIGINAL RESEARCH ARTICLE

**Phytochemical Screening of *Ficus glomerata*. Roxb. Galled leaves**

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Received 03 Nov 2011; Revised 08 Jan 2012; Accepted 17 Jan 2012

**ABSTRACT**

*Ficus glomerata*. Roxb. commonly called as “Fig tree” is traditionally popular for its medicinal properties. The psyllid insect *Pauropsylla depressa* was identified in the present study to induce leaf galls in *F. glomerata*. Preliminary phytochemical screening of the various extracts of galled leaves in *F. glomerata* showed the presence of alkaloids, steroids, quinones and phenols in addition to fluorescence compounds. The therapeutic properties of these phytochemicals and their pharmacological significance are outlined.

**Keywords:** *Ficus glomerata*, phytochemical studies, galled leaves, Psyllid insect.

**INTRODUCTION**

India has a rich source of plant biodiversity possessing tremendous medicinal properties. *Ficus glomerata*. Roxb. is a popular medicinal plant in India, which has long been used in Ayurveda for the treatment of diabetes, liver disorders, respiratory, urinary diseases and inflammatory conditions<sup>[1]</sup>. Commonly called as the “fig tree”. *F. glomerata* extracts have also been reported to possess significant medicinal and pharmacological properties like anti-microbial, anti-cancer and anti-oxidant activity<sup>[2]</sup>. Many parts of the fig plant like the trunk, leaves, flowers etc., are attacked by a number of pathogens including fungi, bacteria and insects. Leaf galls are abnormal outgrowths commonly seen in *F. glomerata*, produced in response to the feeding or oviposition stimulus of insects resulting in excessive growth and cell multiplication<sup>[3]</sup>. Considering their wide distribution in India and varied medicinal uses, the normal and galled leaves of *F. glomerata* were subjected to phytochemical screening to qualitatively determine the occurrence of various constituents like phenols, steroids, and alkaloids etc.,

**MATERIALS AND METHODS:**

*Ficus glomerata* leaves were collected from Perambur, Chennai district, Tamilnadu. Normal and galled leaves were washed, cleaned and dried for further use. Leaf extracts were prepared following the cold filtration method<sup>[4]</sup> with 50%

ethanol and distilled water as the solvents. The extractive value was calculated. Qualitative phytochemical analysis of the normal and galled leaf extracts was done following the procedures of Trease & Evans (1986)<sup>[5]</sup> for alkaloids (Dragendroff’s reagent), terpenoids(Noller’s test), tannins(1% lead acetate), saponins(Foam test), flavanoids(Shinoda test), phenols(Ferric chloride test), steroids(Libermann Burchard test). Fluorescence studies of dried powders of normal and galled leaves with various reagents like acetic acid, concentrated hydrochloric acid and sodium hydroxide was determined under daylight and UV light following the method of Trease & Evans(1986)<sup>[5]</sup>.

**RESULTS**

The normal leaves of *F. glomerata* were dark green in colour with no bulbous outgrowths or masses. The galled leaves were globular, yellowish or reddish brown in colour, devoid of chlorophyll. The galls measured about 15-30mm in diameter. The insect *Pauropsylla depressa* (adult and a few larval stages) was collected from the galled leaves and identified (**Fig 1**). They belong to the order hemiptera and family psylloidea.

The extractive values of *F. glomerata* leaves was 14% w/v in water and 15% w/v with ethanol as solvent. Preliminary phytochemical screening of *F. glomerata* leaves showed the presence of

saponins, alkaloids, steroids, tannins and phenols in both normal and galled leaves and the presence of coumarins and quinones only in the galled leaves (Table 1). Fluorescence studies of normal leaf powders showed the presence of black fluorescence with acetic acid and Conc.HCl while the galled leaf powders showed brown fluorescence in acetic acid and green fluorescence with NaOH and conc. HCl under UV light (Table 2).

Fig 1: Adult and Larval Stage of *Pauropsylla depressa*  
Adult (10X)



Larva(40X)

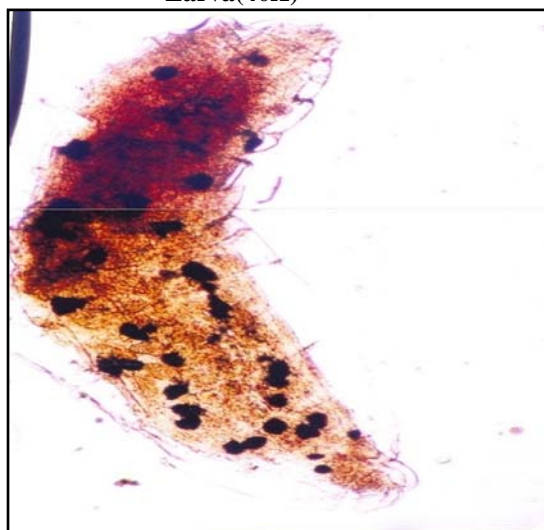


Table 1: Phytochemical Screening of *Ficus glomerata* extracts

Phytochemicals	Inference			
	NA	GA	NE	GE
Saponins	+	+	-	-
Alkaloids	-	+	+	-
Steroids	+	-	-	+
Coumarins	-	-	+	+
Tannins	+	+	+	+
Quinones	-	+	-	+
Phenols	+	+	+	+

+ = Presence; - = absence; NA = Normal aqueous extract; GA = Galled aqueous extract; NE = Normal ethanol extract; GE = Galled ethanol extract.

Table 2: Fluorescence analysis of *Ficus glomerata* leaf extracts

Chemicals	Under UV Light	
	Normal	Galled
Acetic acid	Dark brown	Brown
Sodium hydroxide	Yellowish	Dark green
Hydrochloric acid	Dark brown	Green

## DISCUSSION

Phytochemicals are naturally occurring; biologically active, non-nutritive chemical compounds found in plants and act as a natural defense system against various pests. Various phytochemicals have been known to possess medicinal properties and hence widely used in Indian systems of traditional medicine<sup>[6]</sup>. In this study, various phytochemicals like saponins, alkaloids, tannins, etc were present in both normal and galled leaves of *F. glomerata* indicating their potential medicinal uses. Flavanoids tannins and alkaloids have anti-diabetic and anti-inflammatory activity<sup>[7,8]</sup>. Steroids and saponins have analgesic properties and central nervous system activities<sup>[9]</sup>. The galled leaves also showed higher contents of phytochemicals which is in accordance with the reports of Akkad<sup>[10]</sup> and Motta *et.al*<sup>[11]</sup> who reported variations in sugars and phtohormones in gall tissue when compared to normal plant tissue.

## CONCLUSION

Phytochemical screening of normal and galled leaves of *F. glomerata* revealed the occurrence of a variety of pharmacologically significant compounds like flavanoids, tannins, alkaloids, steroids and saponins which are known for their medicinal and therapeutic properties. Fluorescence studies of powder with various reagents revealed the presence of green fluorescence with conc. HCl and NaOH under UV light for galled leaves. The present preliminary study could be used as a tool for further detailed analysis to standardize the crude drugs and to conduct clinical trials to investigate the unexploited potential of this plant in the pharmaceutical/herbal industry.

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