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Phytochemical analysis of Gallant soldier (*Galinsoga parviflora*) Cav. (Asteraceae) from Nilgiris of India

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Abstract
The main aim of this study is to evaluate phytochemical screening of petroleum ether, ethanol and methanolic extracts from the leaves of *Galinsoga parviflora* Cav. Asteraceae from Nilgiris India. Chemical constituents such as alkaloid, steroid, flavonoids, tri terpenoids, simple sugar aminoacid and fatty acids were detected from the dried leaves of *Galinsoga parviflora* by using various solvent extract. To my knowledge, in India, this is the first report against antimicrobial activity and phytochemical screening of a weed called Gallant soldier.

Keywords: *galinsoga parviflora* cav. asteraceae, petroleum ether, ethanol and methanolic extracts gallant soldier

Introduction
Present, ethnobotany has become increasingly valuable in the development of health care and conservative programs in the world (Ballick, 1996). The folk medicines or ethnomedicine of the tribal and other aboriginal people of the world are mainly based on medicinal plants. The communities are abounding with rich store house of traditional knowledge. Though it has no scientific bases but formed important source for further scientific validation. Today, chemical and pharmacological investigations have added a great deal to the use of medicinal plants by revealing the presence of active principles and their actions on human and animal system. These active principles are mostly on a wide variety of plant's secondary metabolites such as tannins, terpinoids, alkaloids, flavinoids and saponins. Therefore it is important to understand and identify the phytochemical constituents of local medicinal plants

The genus *Galinsoga* belongs to family Asteraceae is represented with 13 species, mostly distributed North and South America (Boulos, 2002) Galinsoga parviflora Cav. has recently been introduced and naturalized as a weed in Nile delta of Egypt (Boulos, 2002). In India, *Galinsoga parviflora* and *Galinsoga quadriradiata* are distributed in most of the Indian hill stations.

Why Galinsoga species for the phytochemical analysis
External application of leaf past of *Galinsoga parviflora* and *G. quadriradiata* useful in treating in nettle sting and other skin inflammation. The juice of the plant is applied to treat wound and cuts. The leaf past of *G. quadriradiata* used in treating snake scorpion bite and also help to coagulate the blood of fresh cuts and wounds. In Egypt, the leaves of *Galinsoga parviflora* and *G.quadriradiata* are commonly used for making soup and salad. In South and North America the leaves and shoots of these plants are cooked and eaten as potherb or added to stew. The fresh leaf juice G. *parviflora* mixed with lemon commonly used against dysentery and bloody stool. More over 100 grams of edible leaves *of Galinsoga parviflora* contains: water 88.4 g, energy 653 (kcal), protein 3.2g, Fat 0.4 g, carbohydrate 5.2 g, fibre 1.1 g, Ca 284mg, Mg 60 mg, P 58 mg, Zn 1.3 mg vitamin-Thiamine 0.4 mg, riboflavin 0.08 mg, niacin 1,2 mg, carotene 4 mg and ascorbic acid is 6.7 mg. In spite of its great significance, in India, Galinsoga species are rarely used in the traditional system. Hence, great effort is to be taken to include this two wild species under traditional health care system.

Fig

Taxonomic tree genus Galinsoga

Domain	:	Eukaryota
Kingdom	:	plantae
Phylum	:	spermatophyte
Subphylum	:	angiospermae
Class	:	dicotyledonae
Order	:	asterales
Family	:	astraceae
Genus	:	Galinsoga
Species	:	*Galinsoga parviflora*

Table 1

Common name	Gallant soldier
Chinese name	Niu-Xi-ju
Tamil name	Mookathi chedi
Local (Baduga) name	Kotha kasa
Binomial name	*Galinsoga parviflora* Cav.

Materials and methods

Plant collection

The plant G. *parviflora* Cav. was collected in the month of January 2017 from plants growing naturally in the fields from Kotagiri hill of Nilgiris, India and authenticated by Dr. Rajesh Asst professor Department of Botany Government Arts College Ooty. The plants were shade dried and pulverized by using electric blender.

Preliminary phytochemical screening

prepration of plant extract

About 20 gm powder plant sample was extracted with 200 ml of methanol in 250 ml conical flasks with continuous shaking in an orbital shaking incubator-RIS24 at 30^0 C for overnight. The extract is filtered by using whatman no.42 filter paper and 20 ml of the filtrate was kept separately for testing flavonoids. The remaining portion of the filtrate was concentrated to $1/10^{th}$ volume at 40^0 C in a Buchi rotary vacuum evaporator. The concentrated extract is then transferred to a Petridis and dried in the oven at 30^0 C for overnight. The dried residue obtained from the filtrate is collected and then subjected to qualitative test for the presence of various chemical constituents. The procedure was repeated for petrol ether and ethanol extract.

5.2.1.4 Qualitative phytochemical test: the methanolic extracts of different plant parts of ethno botanically selected medicinal plants are subjected to following standard qualitative detection method(Harborne,1998; Kapoor; et al., 1969; Kokate, 1999; Mace, 1963; Odebiyi and Sofowora, 1978) for the presence of various bioactive compounds such as Alkaloids, Flavonoids, Tannins, Saponins and Terpinoids.

1. **Alkaloids:** the methonal extracts was evaporated to aridness. A part of the residue is dissolved individually in dilute hydrochloric acid and filtered. The filtrate were used to test the presence of alkaloids

a) **Mayer's test**. Filtrate were treated with mayer's reagent. Formation of yellow cream precipitate indicates the presence of alkaloids.

b) **Wagners's test**: Filtrate were treated with wagner's reagent. Formation of brown or reddish brown precipitate indicates the presence of alkaloids.

c) Detection of flavonoids lead acetate test: Extracts were treatedwith few drops of lacetate solution. Appearance of light yellow colour precipitate indicates that the presence of flavonoids Two ml of acetic anhydride was added to five mg of the extracts, each with two ml of H2SO4. The colour was changed from violet to blue or green in some samples indicate that the presence of steroids.

2. **Flavonoids:** Mix the concentrated HCl and Mg ribbon with 3 ml of plant extract (ethanol extract). Appearance of pink or crimson colour precipitate indicating the presence of flavonoids (Kapoor et al., 1969).
3. **Saponin:** the methanolic plant extract is evaporated to dryness and the residue is dissolved in water and shake vigorously. A honey comb froth persisting for 15-30 minutes indicates the presence of saponins (Kapoo et al., 1969.
4. **Tannins:** 0.5g of extract is stirred with 10 ml of distilled water and then filtered. The filter is added with two drops of 5% FeCl reagent. Appearance of dark green to blue black colour indicates the presence of tannins. (Mace, 1963 ; odebiye and Sofowora 1978)
5. **Detection of steroid**. 5 mg extract were mixed with acetic anhydride and mixture is treated with 2 ml of H_2SO_4 appearance of violet to blue indicates presence of sterol.
6. **Detection of phenol**. 10 gram of extract were treated with ferric chloride. Appearance of bluesh black colour indicates presence of phenol.
7. **Detection of terpinoids. Salkowskis test.** 5 mg leaf extract is mixed with 2 ml of chloroform and again treated with concentrated H_2SO_4. appearesence of reddish brown indicates presence of terpinoids.
8. **Carbohydrate test:** 0.5 mg extract were dissolved individually in 5 ml of distilled water and filtered. The filter were used to test the presence of carbohydrate
9. **Protein test Nin hydrin Test:** 0.5 mg of extract mixed with freshly prepared 0.2% of Ninhydrin reagent. Change of violet colur indicates presence of protein or amino acid
10. **Fat test:** test solution was applied on filter paper. It develops a transparent appearance

Table 2: Preliminary phytochemical analysis of *Galinsoga parviflora*

Phytochemicals		Petroleum ether extract	Ethanol extract	Methanol extract
Alkaloid test	Wagner's	+	++	+
	Mayer's	+	+	+
Flavinoid test.		-	+	+
Phenol		+	+	+
Steroid		-	-	+
Terpenoids		++	+	+
Carbohydrate		+	+	+
Protein		+	+	+
Tannin			-	+

(++)= moderately present, (+) = less present and (-) = absent

Result and discussion

The result of phytochemical analysis of *Galinsoga parviflora* are shown in table 2. The alkaloids are found to be present in all three solvent extracts (Methonal, ethonal and petroleum ether.

The phytochemical investigation of all the extracts of Galinsoga parviflora revealed the presence of alkaloid, phenol, flavonoid, sterol, terpinoids, carbohydrates and protein, however alkaloid found to be more in ethanol extract than other two solvents. Tannin and sterol found to be present only methanol extract and absent in other solvents. Thus the preliminary phyto chemical analysis is more necessary for knowing the medicinal properties of plants.

Conclusion

The detailed survey of literature revealed that the species of Galinsoga exhibited ant-microbial, anti-inflammatory and antioxidant properties due to presence of alkaloid, saponins, flavonoids, tannins and other phytochemicals. Thus present studies along with previous studies prove that *Galinsoga parviflora* has great medicinal properties for the human ailment.

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