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Phyto chemical investigation & anti-ulcer activity of *Jasminum grandiflorum*

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Abstract
The leaves and Roots of *Jasminum grandiflorum* L. (Family: Oleaceae) is used in folk medicine for treating ulcerative stomatitis, skin diseases, ulcers, wounds, etc. Anti-ulcer activity of alcoholic extract of leaves and Roots of *Jasminum grandiflorum* L. were evaluated employing aspirin + pylorus ligation (APL) induced acute gastric ulcer models in albino rats. The effect of ethanolic extract of leaves and Roots of *Jasminum grandiflorum* L. (200 mg/kg, b.w., orally) on the volume of gastric juice, gastric pH, total acid, free acid and ulcer induces in the pyloric legated rats were studied for the assessment of antiulcer activity. There was a significant ($P< 0.01$) dose-dependent decrease in the ulcerative lesion index produced by aspirin + pylorus ligation (APL) induced acute gastric ulcer models in albino rats by leaf Extract as compared to the standard drug pantoprazole (20 mg/kg, b.w. orally). The reduction in gastric fluid volume, free acid, total acid and an increase in the pH of the gastric fluid in APL rats proved the antisecretory and potential antiulcer activity of leaves of *Jasminum grandiflorum*.

Keywords: *Jasminum Grandiflorum*, anti-ulcer activity, phytochemical investigation

Introduction
A search for medicinal plants during the last several centuries has given an innumerable number of plants which are of great use in the treatment of diseases, promoting the health [1]. Every disease has a drug in the plant growing in nature. About 80% of individuals from developed countries use traditional medicines. More and more drugs, both herbal and synthetic are coming up offering newer and better options for treatment of peptic ulcer. *Jasminum Grandiflorum* is one of the plant origin drugs which had been mentioned for its various benefits in the literature of Aurveda [2]. It has been claimed that leaf, flower and roots of *Jasminum Grandiflorum* are being used in many diseases. The present study was to investigate the antiulcer activity of the alcoholic extract of the leaves and Roots of *Jasminum grandiflorum* using aspirin + pylorus ligation (APL) induced acute gastric ulcer models in albino rats. Extraction yields for the determination of this compound in a complex matrix such as tissue. Moreover, the extraction procedure was very fast and it matrix solid phase dispersion (MSPD) extraction method followed by analysis with a LC tandem mass spectrometry system and applied the multivariate statistical approach to optimize the extraction conditions. The analytical method showed high extraction yields for the determination of this compound in

Photo plate showing natural habitat of Jati.

Natural Habitat of Jati. (*Jasminum grandiflorum* Linn)

Showing Inflorescencs of Jati.

Dried leaf of Jati. **Coarse powder of Jati Patra**

Materials and Methods

The roots and leaves of *Jasminum grandiflorum* are collected locally from wild source at Bijapur and identified. 250 gms of air dried roots and leaves of *Jasminum Graniflorum* are powdered and extracted with ethanol 90% separately. The individual extracts were subjected to preliminary phytochemical investigation.

Albino rats of *Wistar* strain of either sex weighing between 150 and 200 g were used. They were housed in standard cages at room temperature (25±2 ◦C) and provided with food and water. The animals were deprived of food for 24 h before experimentation, but had free access to drinking water.

Healthy adult albino rats of 200-250gms are used. Each group consists of six albino rats divided between sexes [3-10].

Antiulcer activity

Leaves extract of *Jasminum grandiflorum*, aspirin and standard antiulcer drug, pantoprazole were prepared in 0.5% sodium Carboxy methyl cellulose (CMC) suspension as vehicle and administered orally once daily at a volume of 10 ml/kg body weight. The animals were divided into four groups, consisting of six each. Group I received aspirin alone (200 mg/kg,). Groups II and III received alcoholic extract of the leaves of *Jasminum grandiflorum* orally at the doses of 100 and 200 mg/kg body weight respectively for 7 days. Group IV received Omeprazole orally at the dose of 30 mg/kg body weight for 7 days [9]. From days 5 to 7, animals of all the groups received aspirin orally as an aqueous suspension at a dose of 200 mg/kg, 2 h after the administration of respective drug treatment [10]. Animals in all the groups were fasted for 18 h after the respective assigned treatment and were anaesthetized with Chloroform. Pyloric ligation was performed as described by Shay *et al*. After four hours of pyloric ligation the animals of all the groups were sacrificed and gastric contents were collected. The total gastric secretion volume expressed as ml/100g body weight and pH were measured. The free acid and total acid content was determined by titrimetric method using 0.01N NaOH [11]. In addition, the ulcer index was determined by opening the stomach on greater curvature and the scores were given 0 to 3 depending upon the severity of ulcers (normal colored stomach = 0, red coloration = 0.5, ulcer spots <5 = 2 and ulcer spots 3 but 3 = 1, > 5 = 3). Ulcer index (UI) was then calculated from the above scorings as follows:

$UI = UN + Us + Up \times 10-1$

Where,

*U*N is the average of number of ulcers per animal,

*U*s is the mean severity of ulcer score and

*U*p is the percentage of animals with ulcer incidence.

Results and Discussion:

T.S of *Jasminum Grandiflorum* leaf shows single layered epidermal cells, vascular bundles at mid rib & covering trichomes [9].

Leaf constant values:

Stomatal number: 12-18 mm^2

Stomatal index: 16.5 m.

Vein Islet No: 20 mm^2

Vein Termination No: 12mm^2.

The results are presented in Table 2. The results indicate that the pH, free acid, total acid, volume of gastric juice and the ulcer index were reduced significantly in the animals pretreated with the leaves extract of *Jasminum grandiflorum* and Pantaprazole. Animals in the APL group showed a significant ($P< 0.01$) increase in the ulcer index and acid secretary parameters like gastric volume, pH, free and total acidity when compared with those of vehicle treated group. Administration of leaves extract of *Jasminum grandiflorum* produced significant ($P< 0.01$) decrease in ulcer index in a dose dependent manner. The extract also significantly reduced the gastric volume, total and free acidity, and increased the pH of the gastric fluid, proving its anti-secretary activity. Peptic ulcer results due to overproduction of gastric acid (or) decrease in gastric mucosal production. Aspirin + pylorus ligation (APL)-induced ulcers occur because of an increase in acid-pepsin accumulation due to pylorus obstruction and subsequent mucosal digestion. In folk medicine, *Jasminum grandiflorum* leaves have been used for the treatment of ulcerative stomatitis, ulcers and wounds

Preliminary Phytochemical Investigation

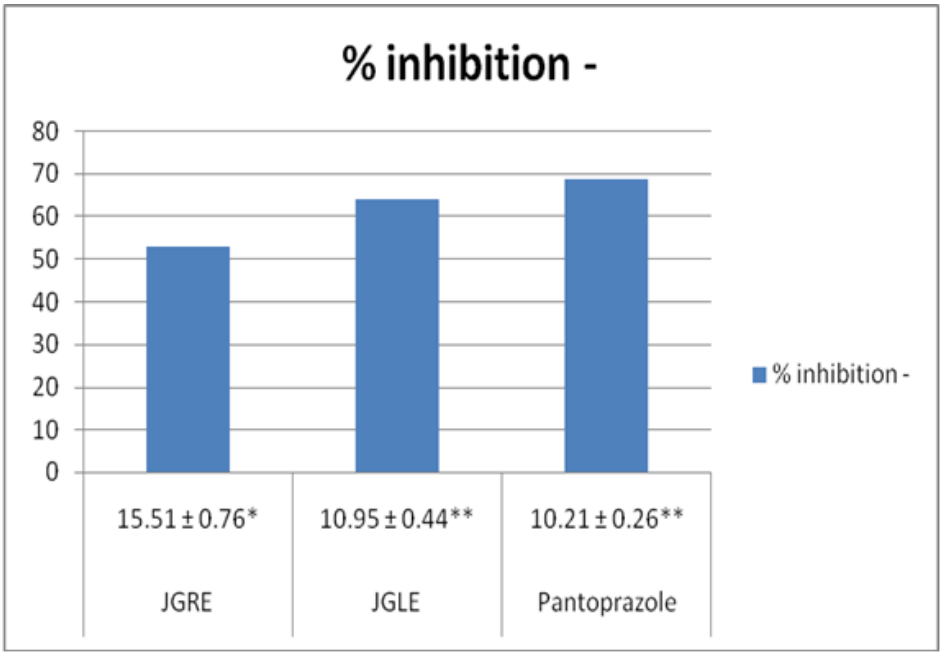
Table 1: Showing preliminary Phyto chemical test

Tests:	Leaf extract	Root extract
1. Test for sterols		
a) Salkowski's test	**+ ve**	**+ ve**
b) Liberman-Burchardt's test.	**- ve**	**+ ve**
c) Sulphar test	**+ ve**	**+ ve**
2. Test for proteins		
i) Biuret test	**+ ve**	**- ve**
ii) Million's Test:	**+ ve**	**- ve**
iii) Xanthoprotein Test:	**+ ve**	**- ve**
3. Test for Triterpenoids		
i) Liebermann's Test:	**-ve**	**- ve**
ii) Tschugajew Test:	**+ ve**	**- ve**
4. Test for Alkaloids		
i) Mayer's Test:	**+ ve**	**+ ve**
ii) Wagner's Test:	**+ ve**	**+ ve**
iii) Hager's Test:	**+ ve**	**+ ve**
iv) Dragendorff's Test:	**+ ve**	**+ ve**
5. Test for carbohydrates		
i) Molish's Test:	**+ ve**	**+ ve**
ii) Barfoed's Test:	**- ve**	**+ ve**
iii) Benedict's Test:	**+ ve**	**+ ve**
6. Test for Saponin's		
i) Foam Test:	**+ ve**	**- ve**
ii) Hemolytic Test	**+ ve**	**- ve**
7. Test for Tannin's		
i) Ferric chloride test:	**+ ve**	**+ ve**
ii) Lead acetate test:	**+ ve**	**+ ve**
iii) Bromine water test:	**- ve**	**+ ve**
8. Test for Flavonoid's		
i) Shinoda Test:	**+ ve**	**+ ve**
ii) Lead acetate:	**+ ve**	**+ ve**
iii) Alkaline reagent test:	**+ ve**	**+ ve**
iv) Ferric chloride test:	**+ ve**	**+ ve**
v) Bromine water test:	**- ve**	**- ve**
vi) Zinc HCl reduction test:	**+ ve**	**+ ve**

Table 2: Effect of *Jasminum grandiflorum* leaf extract (JGLE) *Jasminum grandiflorum* Root extract (JGRE) on gastric secretion using aspirin + pylorus ligation rat model

Treatment	Dose (mg/kg)	Gastric volume (ml/100 g)	pH	Free acidity (equiv./100 g/4 h)	Total acidity (equiv./100 g/4 h)	Ulcer index	% inhibition
Aspirin	200 (p.o.)	2.32 ± 0.05	1.55 ± 0.013	77.33 ± 0.52	95.03 ± 1.12	32.83 ± 0.85	-
JGRE	100 (p.o.)	0.77 ± 0.01*	3.55 ± 0.01*	36.55 ± 0.05*	42.76 ± 0.71*	15.51 ± 0.76*	53
JGLE	200 (p.o.)	0.54 ± 0.01**	4.41 ± 0.13**	17.55 ± 0.41**	31.42 ± 0.42**	10.95 ± 0.44**	64
Pantoprazole	20 (p.o.)	0.44 ± 0.03**	5.06 ± 0.08**	15.40 ± 0.38**	25.71 ± 1.0**	10.21 ± 0.26**	69
F		722	165.86	385.3	284.23	121.71	
d.f.		3, 20	3, 20	3, 20	3, 20	3, 20	
p		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

Data are expressed as the mean ± S.E.M.; n = 6 in each group. **P*< 0.05, ***P*< 0.01 when compared to aspirin treated group (one-way ANOVA followed by Dunnett's test)



Graph 1: Showings mean percentage of Ulcer index

Conclusion

The leaf extract had exhibited more significant Ulcer healing activity. The Anti-ulcer activity of leaves may be due to Soothing property of essential oils or protein precipitating property of Tannins. Further study needs investigation to pinpoint the mechanism of activity.

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