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## Phyto chemical investigation & wound healing activity of *Jasminum grandiflorum*

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**Abstract**

The influence of roots and leaf extracts of *Jasminum grandiflorum* was studied for its wound healing activity using excision wound model. The roots and leaves of *Jasminum grandiflorum* were extracted with alcohol 90%, were subjected to phytochemical investigation. The root and leaf extracts were screened for wound healing activity. The animals were divided in to four groups in excision wound model, controls were treated with normal saline, standard were treated with Betadine and the experimental groups were treated with root and leaf extracts of *Jasminum grandiflorum* till complete epithelisation. The leaf extract treated wounds were found to epithelise faster as compared to control group. Leaf extract treated rats exhibited 61.346% reduction in the wound area when compared to control 55.72%. The demonstration of increased rate of wound contraction findings suggests the use of *Jasminum grandiflorum* leaf extract in the management of wound healing.

**Keywords:** *Jasminum grandiflorum*, wound-healing, 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. Jati 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. In present study *Jasminum grandiflorum* was subjected for different studies to know its chemical constituents in the different parts of the plant and an attempt has been made to find out the wound healing efficacy [3].

**Photo plate showing natural habitat of Jati.**

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## Materials and Methods

The roots and leaves of *Jasminum grandiflorum* are collected locally from wild source at Bijapur and identified<sup>4</sup>. 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.

Healthy adult albino rats of 200-250gms are used. Each group consists of six albino rats divided between sexes<sup>5</sup>.

## Wound healing activity

The animals were starved for 12 hours prior to the Wounding. A circular wound of about 2cm diameter was made on depilated dorsal thoracic region of rats [6]. Animals were divided in to 4 groups, control treated with normal saline, test groups treated with 250mg leaf & root extracts once in a day to full area of wound & standard group treated with same dose of Betadine ointment [7]. The parameters studied were wound closure, epithelisation, size & shape of scar area [8].

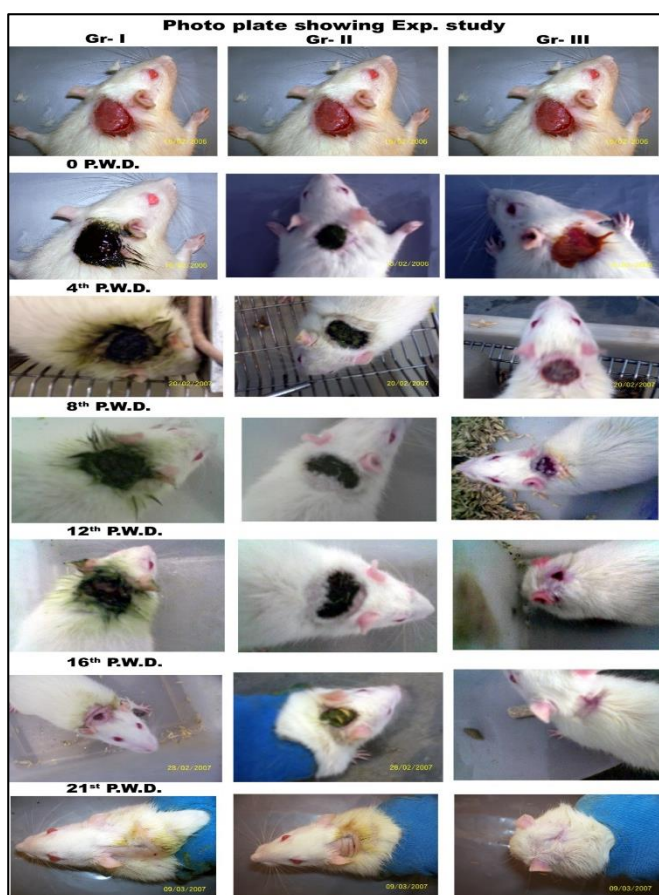


Fig: wound healing treatment groups (I, II, III)

## 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 <sup>2</sup>
Stomatal index	:	16.5 m.
Vein Islet No	:	20 mm <sup>2</sup>
Vein Termination No	:	12mm <sup>2</sup> .

## Preliminary phytochemical investigation

Table 1: Showing preliminary phytochemical test

Tests:	Leaf extract	Root extract
<b>i) Test for sterols:</b>		
a) Salkowski's test	+ ve	+ ve
b) Liberman-Burchardt's test.	- ve	+ ve
c) Sulphar test	+ ve	+ ve
<b>ii) Test for proteins:</b>		
i) Biuret test	+ ve	- ve
ii) Million's Test:	+ ve	- ve
iii) Xanthoprotein Test:	+ ve	- ve
<b>iii) Test for Triterpenoids:</b>		
i) Liebermann's Test:	-ve	- ve
ii) Tschugajew Test:	+ ve	- ve
<b>iv) Test for Alkaloids:</b>		
i) Mayer's Test:	+ ve	+ ve
ii) Wagner's Test:	+ ve	+ ve
iii) Hager's Test:	+ ve	+ ve
iv) Dragendorff's Test:	+ ve	+ ve
<b>v) Test for carbohydrates:</b>		
i) Molish's Test:	+ ve	+ ve
ii) Barfoed's Test:	- ve	+ ve
iii) Benedict's Test:	+ ve	+ ve
<b>vi) Test for Saponin's:</b>		
i) Foam Test:	+ ve	- ve
ii) Hemolytic Test	+ ve	- ve
<b>vii) Test for Tannin's:</b>		
i) Ferric chloride test:	+ ve	+ ve
ii) Lead acetate test:	+ ve	+ ve
iii) Bromine water test:	- ve	+ ve
<b>viii) Test for Flavonoid's:</b>		
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: Wound healing activity of *Jasminum grandiflorum* leaf & root exts in the Excision wound model.

Wound Area%	Control	Leaf Extract	Root Extract	Standard
Day 4	10.50±0.63	16.75±1.33	14.58±1.70	21.84±1.75
Day 8	23.06±1.02	28.83±1.27	26.25±1.27	41.84±2.22
Day 12	64.50±0.69	72.66±2.3	67.91±1.42	75.66±2.45
Day 16	79.68±0.18	89.58±1.33	86.66±3.30	94.91±1.78
Day 18	91.43±0.70	100	93.58±0.76	100
Epithelisation in Days	21±0.365	15.66±0.21	17.83±0.30	15.16±0.47

Table 3: Showing% closure of original wound area on 4<sup>th</sup> day

S.No	Group I	Group II	Group III	Group IV
01	11.84	19	13	22
02	12.02	13.5	16	27
03	8.48	18	9.5	19
04	10.0	21	17.5	26
05	11.67	16.5	20.5	21.5
06	9.0	12.5	11	15.5
Mean	10.50	16.75	14.58	21.84
SD	1.55	3.26	4.16	4.29
SEM	0.6339	1.33	1.70	1.75
T Value	---	4.231	2.250	6.075
P value	---	0.0017***	0.0482*	0.0001***

\*-→Insignificant \*\*→Significant \*\*\*→More significant

**Table 4:** Showing% closure of original wound area on 8<sup>th</sup> day

Sl.No	Group I	Group II	Group III	Group IV
01	26.50	27.5	23	34.5
02	23.00	24	27	39.5
03	21.00	28.5	19.5	44.5
04	19.55	29.5	24	50
05	24.72	33.5	34.5	44
06	23.64	30	29.5	38.5
Mean	23.06	28.83	26.25	41.84
SD	2.51	3.12	5.29	5.45
SE	1.025	1.27	2.13	2.22
T Value	---	3.523	1.329	7.654
P Value	---	0.0055***	0.2133**	0.0001***

\*-→Insignificant \*\*→Significant \*\*\*→More significant

**Table 5:** Showing% closure of original wound area on 12<sup>th</sup> day

Sl.No	Group I	Group II	Group III	Group IV
01	63.15	78.5	64	77.5
02	64.80	74.5	68.5	79.5
03	62.19	79	59.5	83.5
04	65.71	69.5	74	71.5
05	66.87	70	73.5	75.5
06	64.50	64.5	68	66.5
Mean	64.53	72.66	67.91	75.66
SD	1.69	5.68	5.56	6.01
SE	0.69	2.3	2.27	2.45
T Value	---	3.36	1.42	4.364
P Value	---	0.0072***	0.1849*	0.0014***

\*-→Insignificant \*\*→Significant \*\*\*→More significant

**Table 6:** Showing% closure of original wound area on 16<sup>th</sup> day

Sl.no	Group I	Group II	Group III	Group IV
01	78.94	89.5	84.5	91.5
02	79.47	94.5	83.5	90
03	80.10	88.5	79.5	90.5
04	80.07	88.5	84.5	93.5
05	80.00	92	86.5	99.5
06	79.50	85	83.5	99.5
Mean	79.68	89.58	86.66	94.91
SD	0.4593	3.26	8.08	4.36
SE	0.1875	1.33	3.30	1.78
T Value	---	7.41	0.1976	8.04
P Value	---	0.0001***	0.8473*	0.0001***

\*-→Insignificant \*\*→Significant \*\*\*→More significant

**Table 7:** Showing% closure of original wound area on 18<sup>th</sup> day

Sl.No	Group I	Group II	Group III	Group IV
01	90.78	--	94.5	--
02	91.20	--	94.5	--
03	90.70	--	90	--
04	91.42	--	95	--
05	92.50	--	93.5	--
06	92.00	--	94.5	--
Mean	91.43	--	93.58	--
SD	0.70	--	1.86	--
SE	0.2847	--	0.7601	--
T Value	---	--	2.74	--
P Value	---	--	0.0205*	--

\*-→Insignificant \*\*→Significant \*\*\*→More significant

**Table 8:** Showing period of epithelisation (in No of days)

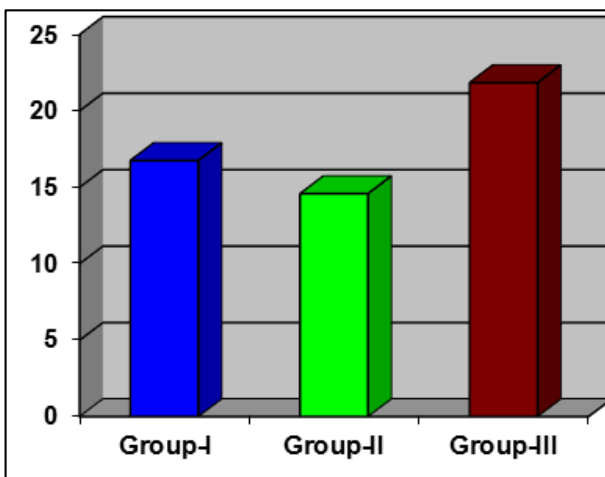
Sl. No	Group I	Group II	Group III	Group IV
01	21	16	18	16
02	22	15	17	17
03	21	16	19	15
04	20	16	18	14
05	20	15	17	14
06	22	16	18	15
Mean	21	15.66	17.83	15.16
SD	0.8944	0.5164	0.7528	1.16
SE	0.365	0.210	0.3073	0.4773
T Value	---	12.64	6.63	9.70
P Value	---	0.0001***	0.001**	0.0001***

\*-→Insignificant \*\*→Significant \*\*\*→More significant

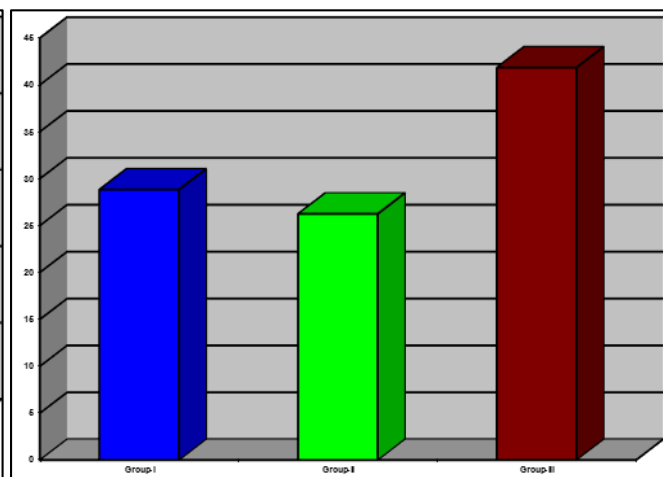
**Table 9:** Size of scar area (sq.mm%)

Sl. No	Group I	Group II	Group III	Group IV
01	16.91	10.49	15.22	9.61
02	15.26	12.63	14.56	9.69
03	17.36	11.23	12.21	8.94
04	17.21	12.51	14.35	9.32
05	14.92	11.97	13.78	8.83
06	15.25	11.61	12.52	8.76
Mean	16.15	11.74	13.77	9.19
SD	1.12	0.8096	1.188	0.450
SE	0.4575	0.3305	0.4851	0.1654
T Value	---	7.81	3.56	14.30
P Value	---	0.0001***	0.0051*	0.0001***

\*-→Insignificant \*\*→Significant \*\*\*→More significant

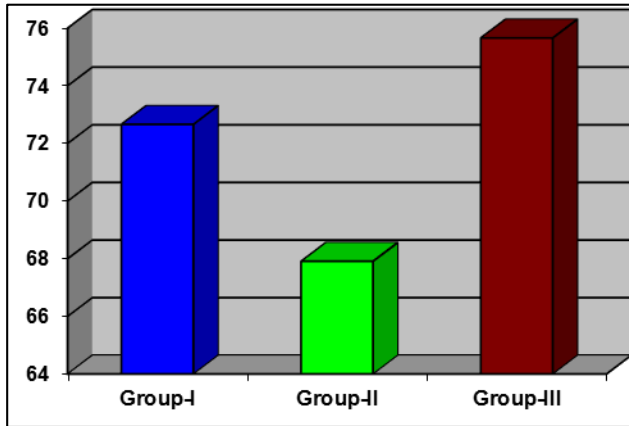


**Graph 1**

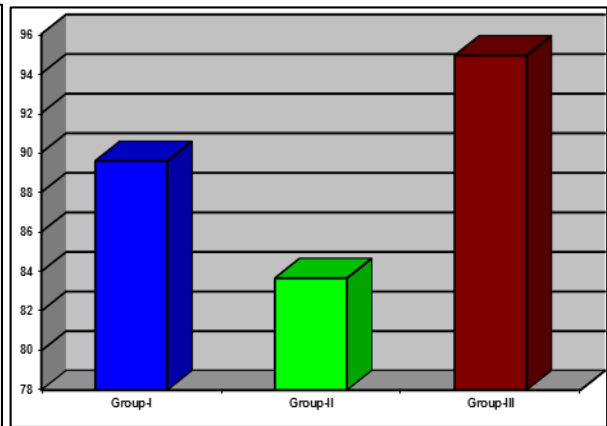


**Graph 2**

**Graph 1 and 2:** Showing mean percentage closure of original excision wound area on 4<sup>th</sup> and 8<sup>th</sup> post wounding day respectively

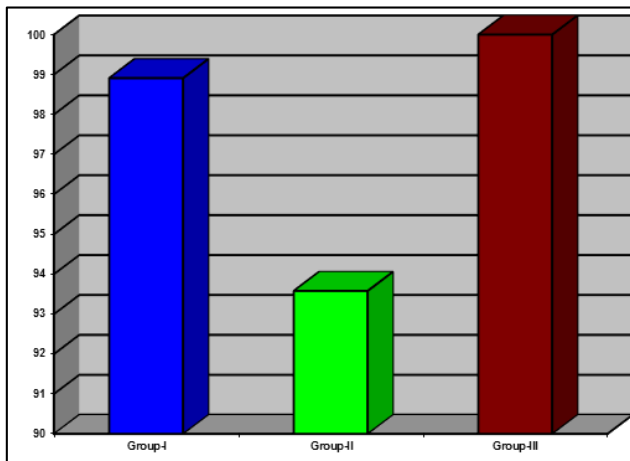


Graph 3

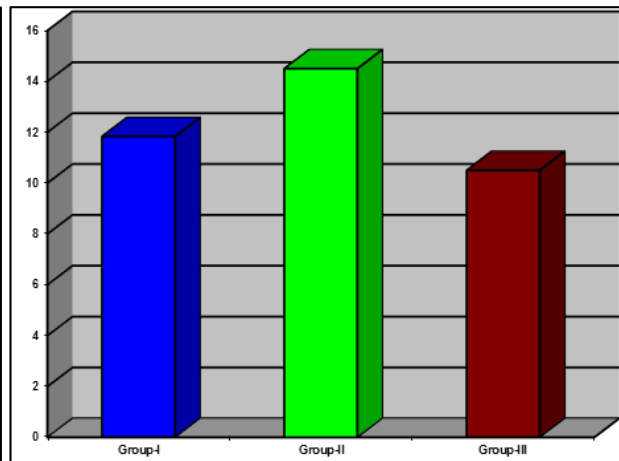


Graph 4

Graph 3 and 4: Showing mean percentage closure of original excision wound area on 12<sup>th</sup> and 16<sup>th</sup> post wounding day respectively



Graph 5



Graph 6

Graph 5 and 6: Showing mean percentage closure of original excision wound area on 21<sup>st</sup> post wounding day and Epithelization in no. of days

### Conclusion

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

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