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PHYTO CHEMICAL INVESTIGATION AND 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.

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 health¹. 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 Aurveda². 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 efficacy³.

MATERIALS AND METHODS: The roots and leaves of *Jasminum grandiflorum* are collected locally from wild source at Bijapur and identified⁴. 250 gm 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 - 250 gm are used. Each group consists of six albino rats divided between sexes⁵.

Wound Healing Activity: The animals were starved for 12 h prior to the Wounding. A circular wound of about 2 cm diameter was made on depilated dorsal thoracic region of rats⁶.

Animals were divided in to 4 groups, control treated with normal saline, test groups treated with 250 mg leaf and root extracts once in a day to full area of wound and standard group treated with same dose of Betadine ointment⁷. The parameters studied were wound closure, epithelisation, size and shape of scar area⁸.



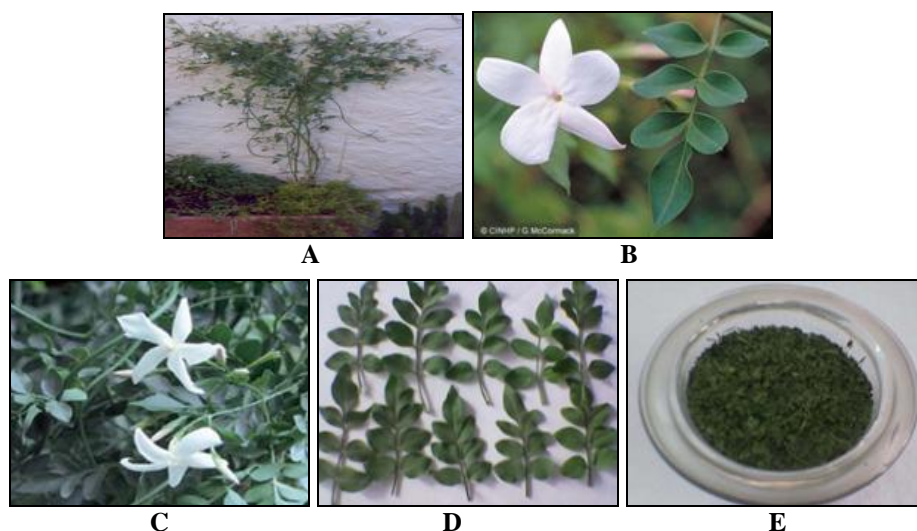


FIG. 1: PHOTO PLATE SHOWING NATURAL HABITAT OF JATI. (A) Natural habitat of Jati. (*Jasminum grandiflorum* Linn.); (B and C) Showing inflorescences of jati; (D) Dried leaf of Jati. (E) Coarse powder of Jati Patra.

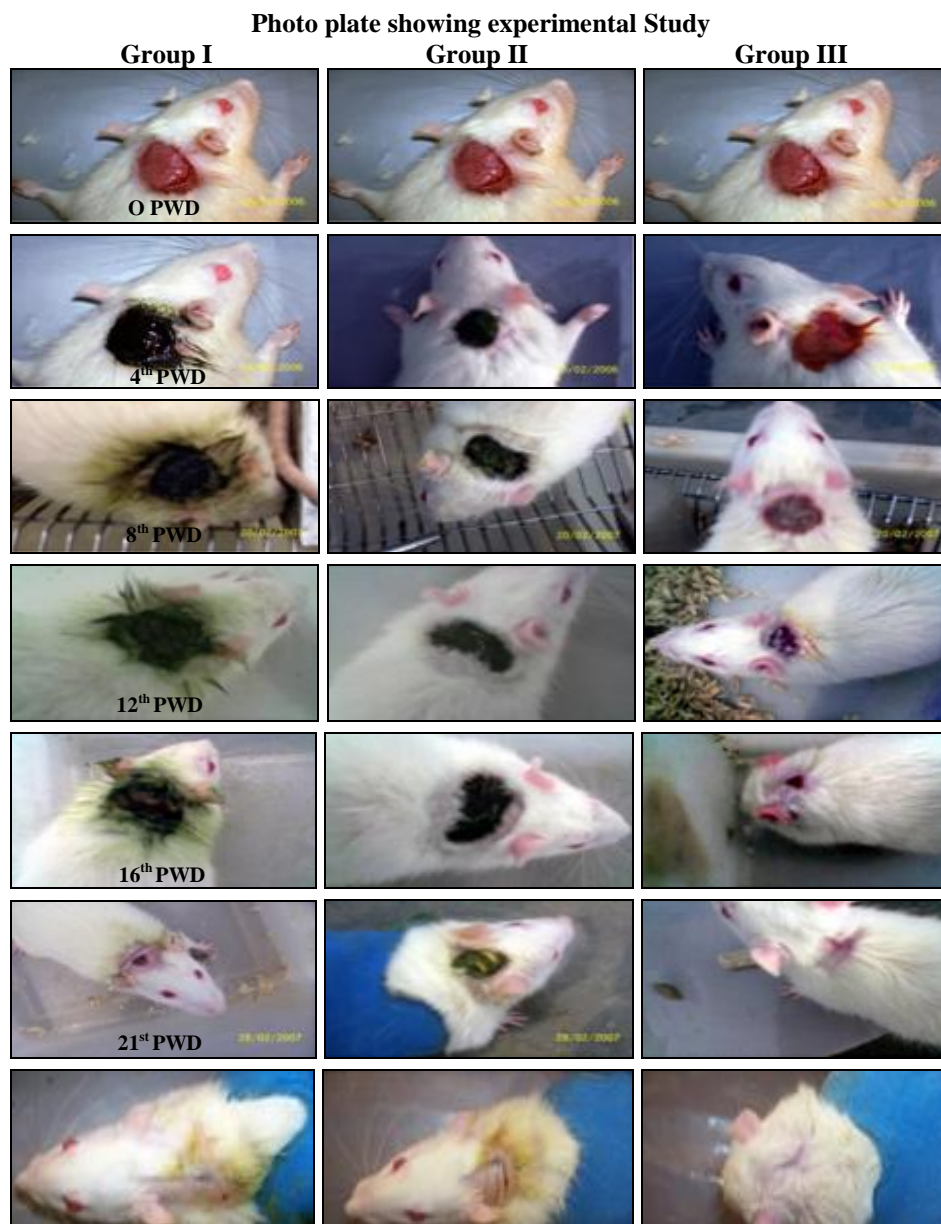


FIG. 2: WOUND HEALING TREATMENT GROUPS (I, II, III)

RESULTS AND DISCUSSION: TS of *Jasminum grandiflorum* leaf shows single layered epidermal cells, vascular bundles at mid rib and covering trichomes⁹.

Preliminary Phytochemical Investigation:

TABLE 1: SHOWING PRELIMINARY PHYTO-CHEMICAL TEST

Tests:	Leaf extract	Root extract
Test for sterols		
Salkowski's test	+ ve	+ ve
Liberman-Burchardt's test	- ve	+ ve
Sulphar test	+ ve	+ ve
Test for proteins		
Biuret test	+ ve	- ve
Million's Test	+ ve	- ve
Xanthoprotein Test	+ ve	- ve
Test for Triterpenoids		
Liebermann's Test	-ve	- ve
Tschugajew Test	+ ve	- ve
Test for Alkaloids		
Mayer's Test	+ ve	+ ve
Wagner's Test	+ ve	+ ve
Hager's Test	+ ve	+ ve
Dragendorff's Test	+ ve	+ ve
Test for carbohydrates		
Molish's Test	+ ve	+ ve
Barfoed's Test	- ve	+ ve
Benedict's Test	+ ve	+ ve
Test for Saponin's		
Foam Test	+ ve	- ve
Hemolytic Test	+ ve	- ve
Test for Tannin's		
Ferric chloride test	+ ve	+ ve
Lead acetate test	+ ve	+ ve
Bromine water test	- ve	+ ve
Test for Flavonoid's		
Shinoda Test	+ ve	+ ve
Lead acetate	+ ve	+ ve
Alkaline reagent test	+ ve	+ ve
Ferric chloride test	+ ve	+ ve
Bromine water test	- ve	- ve
Zinc HCl reduction test	+ ve	+ ve

TABLE 2: WOUND HEALING ACTIVITY OF JASMINUM GRANDIFLORUM LEAF AND ROOT EXTRACTS 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 4TH DAY

S. no.	Group I	Group II	Group III	Group IV
1	11.84	19	13	22
2	12.02	13.5	16	27
3	8.48	18	9.5	19
4	10.0	21	17.5	26
5	11.67	16.5	20.5	21.5
6	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 8TH DAY

S. no.	Group I	Group II	Group III	Group IV
1	26.50	27.5	23	34.5
2	23.00	24	27	39.5
3	21.00	28.5	19.5	44.5
4	19.55	29.5	24	50
5	24.72	33.5	34.5	44
6	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
SEM	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 12TH DAY

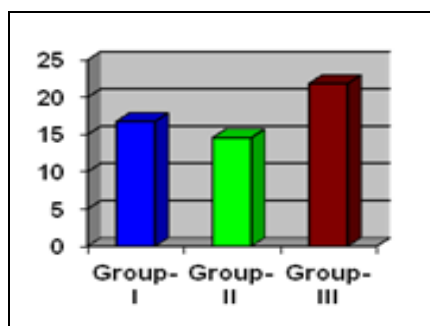
S. no.	Group I	Group II	Group III	Group IV
1	63.15	78.5	64	77.5
2	64.80	74.5	68.5	79.5
3	62.19	79	59.5	83.5
4	65.71	69.5	74	71.5
5	66.87	70	73.5	75.5
6	64.50	64.5	68	66.5
Mean	64.53	72.66	67.91	75.66
SD	1.69	5.68	5.56	6.01
SEM	0.69	2.3	2.27	2.45
T Value	---	3.36	1.42	4.364
P-value	---	0.0072***	0.1849*	0.0014***

*->Insignificant **->Significant ***->More significant

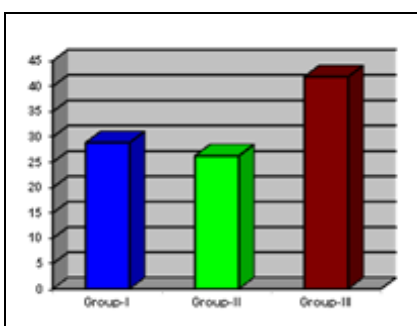
TABLE 6: SHOWING % CLOSURE OF ORIGINAL WOUND AREA ON 16TH DAY

S. no.	Group I	Group II	Group III	Group IV
1	78.94	89.5	84.5	91.5
2	79.47	94.5	83.5	90
3	80.10	88.5	79.5	90.5
4	80.07	88.5	84.5	93.5
5	80.00	92	86.5	99.5
6	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
SEM	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

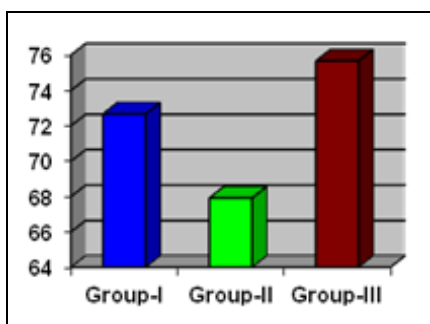


Graph 1

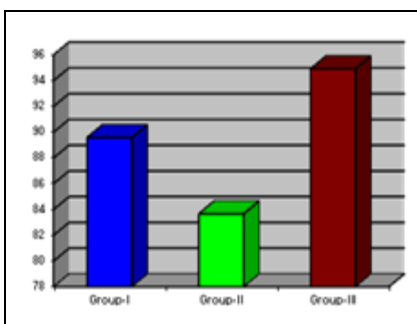


Graph 2

GRAPH 1-2: SHOWING MEAN PERCENTAGE CLOSURE OF ORIGINAL EXCISION WOUND AREA ON 4TH AND 8TH POST WOUNDING DAY RESPECTIVELY

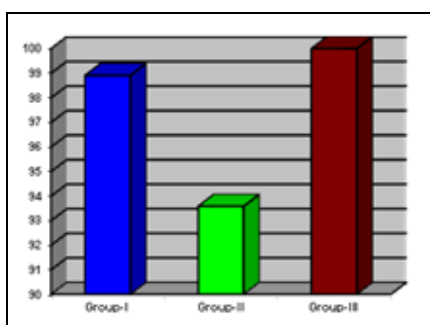


Graph 3

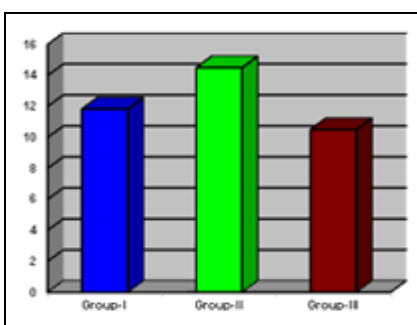


Graph 4

GRAPH 3-4: SHOWING MEAN PERCENTAGE CLOSURE OF ORIGINAL EXCISION WOUND AREA ON 12TH AND 16TH POST WOUNDING DAY RESPECTIVELY



Graph 5



Graph 6

GRAPH 5-6: SHOWING MEAN PERCENTAGE CLOSURE OF ORIGINAL EXCISION WOUND AREA ON 21ST POST WOUNDING DAY AND EPITHELIZATION IN NUMBER OF DAYS

TABLE 7: SHOWING % CLOSURE OF ORIGINAL WOUND AREA ON 18TH DAY

S. no.	Group I	Group II	Group III	Group IV
1	90.78	--	94.5	--
2	91.20	--	94.5	--
3	90.70	--	90	--
4	91.42	--	95	--
5	92.50	--	93.5	--
6	92.00	--	94.5	--
Mean	91.43	--	93.58	--
SD	0.70	--	1.86	--
SEM	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)

S. no.	Group I	Group II	Group III	Group IV
1	21	16	18	16
2	22	15	17	17
3	21	16	19	15
4	20	16	18	14
5	20	15	17	14
6	22	16	18	15
Mean	21	15.66	17.83	15.16
SD	0.8944	0.5164	0.7528	1.16
SEM	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 %)

S. no.	Group I	Group II	Group III	Group IV
1	16.91	10.49	15.22	9.61
2	15.26	12.63	14.56	9.69
3	17.36	11.23	12.21	8.94
4	17.21	12.51	14.35	9.32
5	14.92	11.97	13.78	8.83
6	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
SEM	0.4575	0.3305	0.4851	0.1654
T	---	7.81	3.56	14.30
Value				
P-value	---	0.0001***	0.0051*	0.0001***

*.->Insignificant **->Significant ***->More significant

Leaf Constant Values: Stomatal number: 12 - 18 mm²; Stomatal index: 16.5 m; Vein Islet no.: 20 mm²; Vein Termination no.: 12 mm².

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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CONFLICT OF INTEREST: Nil

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REFERENCES:

1. Shashi A, Jain SK and Pandey M: *In-vitro* evaluation of antilthiatic activity of seeds of *Dolichos biflorus* and roots of *Asparagus racemosus*. International Journal of Plant Sciences 2008; 1: 67-71.
2. Johnson M, Sophia A, Babu A and Raja DP: Iso-peroxidase profile as taxonomic criteria in the morphologically related species of *Jasminum* sp. (Oleaceae). BCAAJ 2010; 4(1): 163-166.
3. Wei FH, Chen FL and Tan XM: Gas Chromatographic-Mass Spectrometric Analysis of Essential Oil of *Jasminum officinale* L. var *Grandiflorum* Flower. Tropical Journal of Pharmaceutical Research January 2015; 14(1): 149-152.
4. Esaki S and Vidyalakshmi A: Protease Activity of Floral Extracts of *Jasminum grandiflorum* L., a Wound Healing Herb. Jou. of Medicinal Plants Studies 2013; 1(4): 11-15.
5. Sandeep, Padmaa M and Paarakh: *Jasminum grandiflorum* Linn. (Chameli): Ethnobotany, Phytochemistry and Pharmacology - A review. Pharmaco. online 2009; 2: 586-595.
6. Hirapara H, Ghori V, Anovadiya A, Baxi S and Tripathi C: Effects of ethanolic extract of *Jasminum grandiflorum* Linn. Flowers on wound healing in diabetic Wistar albino rats. Avicenna Journal of phytomedicine AJP 2017; 7(5): 401-408.
7. Swati S, Swati S and Vadi R: *Jasminum sambac* linn. (motia): A review. International Journal of Pharmaceutical research and bio-science 2013; 2(5): 108-130.
8. Johnson M, Sophia A, Babu A and Raja DP: Iso-peroxidase profile as taxonomic criteria in the morphologically related species of *Jasminum* sps. (Oleaceae). BCAAJ 2010; 4(1): 17-20.
9. Umamaheswari M, Asokkumar K, Rathidevi R, Sivashanmugam AT, Subhadradevi V and Ravi TK: Antiulcer and *in vitro* antioxidant activities of *Jasminum grandiflorum* L. Journal of Ethnopharmacology 2007; 110: 464-470.