BURN WOUND HEALING ACTIVITY OF *Euphorbia hirta*

Jaiprakash.B¹, Chandramohan², D.Narasimha Reddy¹

¹CMR College of Pharmacy, C.A.No.5, Bhuvanagiri, OMBR Layout, Bangalore-560 043.
²Bharathi College of Pharmacy, Bharathi Nagar, Mandya (Dt), Karnataka

Received : 19-10-2005
Accepted : 12-12-2005

ABSTRACT

The Ethanolic extract of whole plant of *Euphorbia hirta* was screened for burn wound healing activity in rats as 2% W/W cream. The study was carried out based on the assessment of percentage reduction in original wound. It showed significant burn wound healing activity.

INTRODUCTION:

Tissue damage from excessive heat, electricity, radioactivity or corrosive chemicals that destroy (denature) protein in the exposed cells is called a burn. Burns disrupt haemostasis because they destroy the protection afforded by the skin. They permit microbial invasion and infection, loss of body fluid and loss of thermoregulation.¹

Several indigenous drugs have been described in Ayurveda (an ancient Indian system of Medicine) for the management of wounds and burns. Hence, in an attempt to study the wound healing activity of several locally available indigenous herbs, we studied and reported the wound healing activity of the ethonalic extract of the whole plant of *Euphorbia hirta* in various models like excision, incision and dead space wounds.² In this communication we report the burn wound healing activity of the same.

Euphorbia hirta Linn. Syn. *Euphorbia pilulifera* auct. non Linn., (Euphorbiaceae) is an annual, erect or ascending herb with hairy stems which is distributed throughout the warmer regions of India.³,⁴ The decoction and juice of the plant is used as antiasthmatic and have been found very beneficial in case of asthma. It is used as astringent in chronic diarrhea and dysentery. It is topically applied as a poultice to the inflamed glands.⁵ Various tribal people in India, Nepal and Nigeria have been using E.hirta in the management of cuts, wounds, boils and burns.⁶-¹¹

Various extracts of *E.hirta* exhibited antimicrobial activity against various microbes including those causing burn and wound infections like *Pseudomonas aeruginosa* and *Staphylococcus aureus*.¹⁰,¹² Hence, *E.hirta* could be beneficial in the management of burn wounds.

MATERIALS & METHODS:

*E.hirta* an annual herb growing wildly in and around, Hubli City, Karnataka, India, were collected during April-May and identified by the Botany department
of Karnatak University, Dharwad, Karnataka, India. The shade-dried plant material was powdered and extracted with Ethanol (95%) by Soxhlet Extraction. The extract was concentrated to dryness by heating on a steam bath at a controlled temperature of 40 to 50°C (Yield 14.14%). A 2% w/w cream of the extract was prepared and employed in the present study.

Healthy Wistar Albino Male Rats weighing 150-200Gms, housed in standard condition of temperature, humidity and light were employed for the present investigation. They were fed with standard rodent diet and water ad libitum.

A burn wound 2 cms in diameter was inflicted to the animals by placing a heated brass weight, which is at 60°C temperature on the depilated back for 10 seconds under light Ether anesthesia. They were then housed individually in separate cages after complete recovery from anesthesia. They were divided in to three groups of six animals as control, standard and test groups. They were treated with 0.5 Gms each of simple cream base, 0.2% w/w Nitrofurazone ointment and the extract cream respectively as a topical application once daily.

The animals were inspected daily and the observations of percentage wound closure was made on 4th, 8th, 12th, and 16th post wounding days. Percentage wound closure was monitored by planimetric measurement of the wound area which was achieved by tracing the wound on a graph paper. Reduction in wound area was expressed in percentage wound closure of original excision wound. The data, expressed as mean ± S.E, has been furnished in table 1.

RESULTS:

On the basis of the results obtained in the present investigations, it can be concluded that the 2% w/w Cream of the Ethanolic extract of whole plant of *Euphorbia hirta* has significant burn wound healing activity. These results support the folklore of the use of the plant in the management of burns.

| Group  | Percentage closure of original burn wound on day |
|--------|-----------------------------------------------|
|        | 4th   | 8th   | 12th  | 16th  |
| Control| 10.03± 1.59 | 20.10± 1.64 | 36.27± 2.83 | 61.54± 3.06 |
| Standard| 17.26± 1.80** | 33.35± 1.88*** | 76.13± 1.87*** | 94.67± 1.85*** |
| Test   | 16.60± 2.09* | 32.26± 2.92* | 64.29± 3.25*** | 88.00± 2.86*** |

Values are mean± S.E, *p<0.05, **p< 0.01, ***p<0.001.
REFERENCES:

Journals:
1. Jaiprakash B, Chandra Mohan B, Savadi R.V, Karadi R.V, Hukkeri.V.I. “Wound healing activity of euphorbia hirta, Fitoterapia, (Communicated).
2. Manandhar N.P, Fitoterapia, LX, 1,61, (1989).
3. Manandhar N.P, Fitoterapia, LXIV, 3,266, (1993).
4. Manandhar N.P, Fitoterapia, LXI, 4,325, (1990).
5. Ajao A.O, Emele F, Femi Onakedo B, Fitoterapia, LVI, 3, 165, (1985).
6. Girach R.D, Singh S, Ahmad M, Brahmam M, Misra M.K, Fitoterapia, LXIX, 1, 24, (1998).
7. Ahmad K Bashir, EL Sayed S Hassan, Mohmad H Amiri, Abdalla H Abdalla, Ibrahim A Wafi, Fitoterapia, LXIII, 4, 371, (1992).

Books:
1. Toratora J. Gerald, Grabowski Sandara Reynolds, “Principles of Anatomy and Physiology”, Harper Collins College Publishers, New York, 8th Edn, p.136.
2. Kirtikar K.R, Basu B.D, Indian Medicinal Plants, Vol.3, International book distributors, Dehradun, India, 2197, (1995).
3. Kohli D.P.S, Shah D.H, “Drug Formulation Manual”, 1998, Eastern Publishers, New Delhi, India, 2nd Edn, p.561-562, 619-620.
4. “The wealth of India”- Raw materials and Industrial products, Vol.3, Publications and information directorate, CSIR, New Delhi, 225(1995)
5. Umrao Singh, Wadhwani A.M, Johri B.M, Dictionary of economic plants of India, ICAR, New Delhi, 83, (1983).
6. Pal D.C, Jain S.K, ‘Tribal Medicine’, Naya Prokash, Kolkatta, India, 97, (1998).