

Short Communication

Wound healing activity of leaf methanolic extract of *Ficus hispida* Linn.

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In this study, the wound healing activity of methanolic extract of the leaves of plant *Ficus hispida* Linn. was evaluated on excision wound model. The leaves of *F. hispida* Linn. were successively extracted by using solvent methanol and screened for phytochemical constituents. Wistar rats (either sex) were given orally doses of 75 and 150 mg/kg body weight at 24 h intervals and their wound contraction area were calculated and wound healing were evaluated at day 0, 4, 8, 12, 16 and 20th. The results of phytochemical screening revealed that methanolic extract showed positive result for carbohydrates, saponins, sterols and tannin. The methanolic extract revealed significance increase in wound healing activity. The present investigation revealed that methanolic extract of *F. hispida* Linn. leaves increase the number of collagen tissue and this mechanism is responsible for wound healing activity. This could provide a rationale for the use of this plant as wound healer in folk medicines.

Key words: Wound healing, herbs, *Ficus hispida*, phyto-medicines.

INTRODUCTION

Wounds generally termed as physical injuries that result in an opening or breaking of the skin. There are different types of wounds which range from mild to potentially fatal. Wound healing is impaired in diabetic patients with infection or hyperglycemia. Diabetes mellitus is one of the major contributors to chronic wound healing problems. Diabetic patients with ulcer are at high risk for major complications which include infection and amputation. In traditional medicine, plants are generally used for treatment of various acute and chronic diseases and abnormalities in the body. Due to the present fast life of the humans, a drastic increase in chronic disease conditions mainly diabetes has been observed. Most of these patients tend to face a tremendous problem when they get an infected wound. Hence, in the current review, a list of the plants used in traditional medicine for the treatment of wounds and diabetes were screened. The

work includes a list of traditionally claimed plants used for diabetes and wounds which are scientifically proved as well as scientifically not proved (Sandhya and Hygeia, 2011).

Ficus hispida Linn. (Moraceae)

Plants of *Ficus* species are used extensively in various parts of the world against a wide range of ailment. The synergistic action of its metabolic production is most probably responsible for beneficial effects of the plant (Bakshi et al., 2001). *Ficus* is a large genus of trees or shrubs, often climbers with milky juice, widely distributed throughout the tropical or hemispheres, but particularly abundant in south-East Asia and Polynesia. About 50 species of *Ficus* occur in India. The genus is remarkable

Table 1. Phytochemical screening of extract of leaves of *Ficus hispida* Linn.

S/N	Phytochemical tests	Inference
1	Glycosides	+
2	Alkaloids	-
3	Carbohydrates	+
4	Sterols	+
5	Saponins	+
6	Tannins	+
7	Flavonoids	+
8	Triterpenoids	+

for the large variation in the habitat of its species. It contains some of the giants of the vegetable kingdom such as Banyan tree, Pipal tree. Traditionally, various parts of the plants of the *Ficus* spp. are used for medicinal purpose. Chemical constituents e.g. oleanolic acid, β -sitosterol, triterpenoids, flavonoids, hispidin, β -amyryn are present (Peraza et al., 2002). According to Ayurveda, it is astringent to bowels; useful in treatment of biliousness, ulcers, erysipelas, vomiting, vaginal complaints, fever, inflammations, leukoderma, psoriasis, hemorrhoids, ulcers and leprosy (Ayyanar and Ignacimuthu, 2009). Pharmacologically, it is used for treatment of diseases like hypoglycemia, cancer, inflammation, diarrhea, etc. (Kirtikar and Basu, 1975).

MATERIALS AND METHODS

Leaves collection and identification

F. hispida Linn. (Family: Moraceae) were collected fresh from Devnager, Paonta sahib, Himachal Pradesh, India in the month of May 2011. The plant was authenticated by botanist Prof. Jaswant Saini, Department of Botany, Govt. Degree College, Paonta Sahib (H.P), India. The specimens vouchers (HIP/02/11/Herbarium/1110) were deposited. The leaves were air dried in the room away from sun light. After dried leaves were crushed to make powder.

Preparation of leaf extract

Extraction of leaves was carried out by the process of maceration. Fresh leaves of the plants were cleaned from extraneous materials, shade dried, powdered mechanically, weighed and stored in air tight container. About 250 g of powdered material was soaked in 1000 ml methanol for 72 h in beaker and mixture was stirred every 18 h using a sterile glass rod. Filtrate was obtained with the help of Whatman filter paper No. 1 and the solvent was removed by rotary evaporator under reduced pressure at leaving a dark brown residue.

Preliminary phytochemical screening of different extracts

The extract of *F. hispida* Linn. leaves were subjected to qualitative chemical tests for identification of various constituents such as

alkaloids, carbohydrates, glycosides, proteins, tannins, sterols, saponins, amino acids, etc (Table 1).

Animal

Albino Wistar rats of the either sex (180 to 200 g) were used for the past study. They were maintained under standard environmental conditions and were fed with standard pellet diet as per CPCSEA guidelines.

Excision wound model

Animals was anesthetized prior to and during creation of the wounds, with 1 ml of chloroform with cotton in desiccators (10 mg/kg). The rats were inflicted with excision wounds as described by Morton et al. (1972) and Kamath et al. (2003). An impression was made on the dorsal thoracic region 1 cm away from vertebral column and 5 cm away from ear on the anaesthetized rat. The dorsal fur of the animals was shaved with an electric clipper and the anticipated area of the wound to be created was outlined on the back of the animals with methylene blue using a circular stainless steel stencil. A full thickness of the excision wound of circular area of 500 mm² and 2 mm depth was created along the markings using toothed forceps, scalpel and pointed scissors. Haemostasis was achieved by blotting the wound with cotton swab soaked in normal saline. The entire wound was left open (Lowry et al., 1951). All surgical procedures were performed under aseptic conditions (Table 2).

RESULTS AND DISCUSSION

Various substances of plant origin have been used in folk medicine of different culture as wound healer, some of which have been identified pharmacologically to exert their effects on the epithelial tissues. Furthermore, ancient literature alluded to the use of numerous plants/preparations including *F. hispida* Linn. as wound healer without any scientific evidence. To understand the scientific reason behind this claim, we investigated the effect of methanolic extract of *F. hispida* Linn. leaves in this study. In this investigation, treatment of the rats (either sex) with the methanolic extract of *F. hispida* Linn., leaves enhance the wound healing in rats. The

Table 2. Percentage of wound contraction by *Ficus hispida* Linn. extracts and standard drug on excision wound model in rats.

Group dose	0 th Day	4 th Day	8 th Day	12 th Day	16 th Day	20 th Day
Control (%)	502.7±3.29	384.3±3.32 (23.54)	302.7±2.40 (39.78)	236.3±2.27 (52.99)	133.7±2.65 (73.40)	24.67±1.52 (95.09%)
Standard (%)	502.7±2.108	323.7±3.32 (35.60)	172.3±3.63 (65.72)	102.3±2.75 (79.64)	19.33±1.43 (96.15)	-[100]
Ficus-75 (%)	502.3±3.70	367.3±3.52 (26.87)	219.5±2.55 (56.30)	135.0±2.29 (73.12)	75.33±2.56 (85.00)	--[100]
Ficus-150 (%)	503.0±2.51	345.0±3.29 (31.41)	208.3±4.04 (58.58)	120.3±3.20 (76.08)	21.33±1.76 (95.75)	--[100]

Wound area (mm²) mean ± SEM and percentage of wound contraction.

healing proceeds with an increase in the number of collagen tissues. New tissues are formed in the wound area and the wound starts healing. The significant increase in wound healing by extract of *F. hispida* Linn. leaves at dose of 75 and 150 mg/kg body weight on day 0, 4, 8, 12, 16 and 20th successively is an indication of enhanced healing effect of the plant on wound.

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