ejpmr, 2021,8(3), 316-319

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

EVALUATION OF *IN VIVO* WOUND HEALING ACTIVITY OF ETHANOLIC FLOWERS EXTRACT OF *CASSIA TORA* LINN

Sangram Keshari Panda*[1], Aswini Kumar Sethi[2] and Suchismita Pani[3]

Jeypore College of Pharmacy, Rondapalli, Jeypore- 764002, Koraput, Odisha, India.

***Corresponding Author: Sangram Keshari Panda**

Jeypore College of Pharmacy, Rondapalli, Jeypore- 764002, Koraput, Odisha, India.

Article Received on 29/12/2020 **Article Revised on 19/01/2021** **Article Accepted on 09/02/2021**

ABSTRACT

The plant *Cassia tora* belonging to family Fabaceae is a annual herb. It is a common plant found in all tropical parts of India and it was previously used in treatment of common skin ailments by Indian tribes. **Objectives:** The present study was carried out to evaluate the wound healing potential of ethanolic flowers extract of *Cassia tora*. **Materias and methods:** These activities were studied by two animal models i.e. Excision and Incision wound model. Soframycin was used as a reference standard and ointment base are used as a control. It was observed that the wound contraction ability of the extract was significantly greater than that of control, which was comparable to that of the reference standard Soframycin ointment **Conclusion:** The result of the present study indicates that ethanolic flowers extract of *Cassia tora* posses significant wound healing in excision and incision wound model. The presence of phytoconstituents like alkaloids, flavonoids and phenols either individually or combined may exhibit the synergistic effect towards the healing of wounds.

KEYWORDS: *Cassia tora*, wound healing, Incision wound, Excision wound.

INTRODUCTION

Herbal medicine has become an integral part of standard health care The World Health Organisation estimate that 80% of people world wide rely on herbal medicines for some aspect for their primary health care.[1] Wounds are physical injuries that result in an opening or breaking of the skin.[2] Proper healing of wound is essentinal for the restoration of disrobed anatomical stability and disrupted functional status of the skin. Repair of injuried tissue occur as progression events, which includes inflammation, proliferation, and migration of different cell types.[3] *Cassia tora* is a small shrub with a wide geographical distribution as a weed in nearly all the Asian countries. Plant belongs to Family Leguminosae that is also known as Pea or bean family that is large and having economic importance in flowering plants flowers are found in pair with five petals and pale yellow in colour, pods are 10-15cm long and sickle shaped and 30-50 seeds are present in a pod,[4] Cassia tora (in oriya Chakunda) is used in traditional medicine as a laxative, antiseptic, antioxidant activity, antiperiodic and allso useful in treatment of leprosy, ringworm, bronchitis, cardiac diseases, hepatic disorder, liver tonic, hemorrhoids, and ophthalmic, skin diseases.[5] These herbs have been describes for their usefulness in the profile of decoctions, infusions and tinctures in traditional system of medicines for treating skin diseases like psoriasis, leprosy etc.[6] Decoctions of parts of Cassia tora is used as an analgesic, anticonvulsant, antipyretic, antifungal, diuretic, expectorant, laxative, purgative, treatment of glaucoma and hypertension, treatment of skin disease, ringworm and itch.[7] Cassia tora has been stated to containmany active constituents, including Anthraquinones, emodin, rhein, quercetin, chrysophenol etc.[8] Review of the literature revealed that though this plant is known for several pharmacological activities, it has not been subjected to scientific evaluation for wound healing activity of flower. Hence an attempt has been made to evaluate the wound healing property of flower part this plant.

MATERIALS AND METHODS

Collection and identification plant material

The flowers of *cassia tora* were collected from the tribal belts of the local area of Rondapalli, Koraput district (India) in month of October 2020. The plant was identified, confirmed and authenticated by the Biju Patnaik Medicinal Plants Garden and Research Centre, Dr. M. S. Swami Nathan Research Foundation, Jeypore, Koraput (District), Odisha (Letterno.MJ/SS/P-406/20,dated (18.10.2020). After authentification the flowers were collected in bulk and shade dried. The dried materials were made into coarse powder and stored in a closed airtight container for further use.

Preparation of Plant extract

The fresh flower of *Cassia tora* was shade dried and powdered. The powder was extracted successively with

Ethanol using Sohxlet Apparatus.150g powdered material was subjected in to solvent 600ml of ethanol by soxhlet apparatus at 120°C temperature for 72 hours. After the Soxhlet extraction, filter the extract and it was collected and dried in a porcelain dish and placed into desiccators for further used for experimental purpose.[9]

Preliminary Phytochemical Screening

The ethanolic flower extract of *Cassia tora* were subjected to preliminary phytochemical screeing to detect the presence of various groups of phytoconstituents by carrying out the different chemical analysis.[10]

Animal

Healthy adult Wister strain of albino rats weighing approximately 180 to 250 gm were used. They were housed in standard conditions of temperature (25 ± 2 °C), 12 h light per day cycle relative humidity of 45-55 % in the animal house of Jeypore College of Pharmacy. They were feed with standard pellets of food and water. Animals were kept, and all operation on animals was done in aseptic condition.

Experimental Protocol

Animals were selected, weighed and divided into three groups (n=6), namely control, standard drug, and one test groups belonging to *Cassia tora* flower extract. The studies conducted were approved by the Institutional Ethical Committee, Jeypore College of Pharmacy, Jeypore, Odisha according to prescribed guidelines of the Committee for Control and Supervision of Experiments on Animals (CPCSEA), Government of India.

Wound Healing Activity

Wound Model

Excision Model

For the excision wound study, animals were divided into three groups of six rats in each group. Group-I served as control and received only saline 2 ml/kg orally, Group-II served as Standard drug (Soframycine ointment) and Group-III, which receive ethanol extracts of *Cassia tora* flower extract ointments. Three groups of animals containing six albino rats in each group were shaved and anesthetized by diethyl ether. wound was initiate on the back lateral of the shaved rats and an area of 400mm^2 full thickness skin was stamp out in the inter scapular region, every alternate day. The change in healing of wound, i.e. the measurement of wound is on graph paper was expressed as unit (mm^2).Wound contraction was expressed as percentage reduction of original wound size. Excision wounds as described by Morton and Malone et al, 1972.[11]

Measurement of wound area

The continuing changes in wound area were measured plan metrically by tracing the wound margin on a graph paper every alternate day. The change in healing of wound i.e. the measurement of wound on graph paper was expressed as unit (mm^2) Wound contraction was expressed as percentage reduction of original wound size.

$$\% \text{ Wound contraction} = \frac{\text{Wound area on day 0} - \text{Wound area on day 20}}{\text{Wound area on day 0}} \times 100$$

Incision model

Three groups of animal containing six albino rats in each groups were taken and shaved. The animals were asleep by diethyl ether. One full thickness papa- vertebral incision of 3cm length was made of the depilated back side of each rat. After the skin incision was made and skin stitched with suture 1cm apart. The first group was untreated, second group treated with standard (Soframycine ointment), and third group was treated with ethanol extracts of *Cassia tora* flower extract ointments.[12,13]

Statistical Analysis

The results are revealed as Mean ± SE. Statistical analysis was done using ANOVA (Tukey-Multiple Comparison Test). When probability (p) was less than 0.05 was considered as significant.[14]

RESULT AND DISCUSSION

The preliminary phytochemical screening showed that the solvent extract of the flower of *Cassia tora* contain alkaloids flavonoids, tannins, saponin and phenolic compound whereas glycoside, carbohydrate and terpinoids are absent. The study on excision would healing model reveal that all the Groups showed the day to day decrease wound area of rats. In excision model on 21 post wound healing day, Group- I of untreated animal (control), Group- II treated with standard ointment (Soframycin) and Group- III treated with ethanolic flower extract ointments of *Cassia tora*. Result data are shown in (table no.2 and graph 1) % of wound contraction. Animal in extract Group compare with standard and control Group. It was observed that reducing the epithelization period of 0day, 2nd, 5th, 7th, 12th, 15th and 20th days wound healing. The tensile strength of group-I untreated was found ($p>0.05$) strength group on 10th post wound day, which indicate wound healing strength of the incision model data are shown in (table 03 and graph 2). The tensile strength of the incision model .The wound healing agent has the properties of enhance the deposition of collagen contain, which provides strength to the tissue and form cross linkages between collagen fiber. Tensile strength depends upon the increase in collagen content. Collagen content data are shown in (table 03, graph 2).

Table 01: Preliminary phytochemical screening of ethanolic flower extract of *Cassia tora*.

Sl.no.	Screening	Ethanolic extract
1.	Alkaloids Test	+
2	Glycosides Test	-
2.	Flavonoid Test	++
3.	Tannins	+
4.	Saponin Test	+
5.	Carbohydrate Test	-
6.	Terpenoids Test	-
7.	Phenolic compoundsTest	++

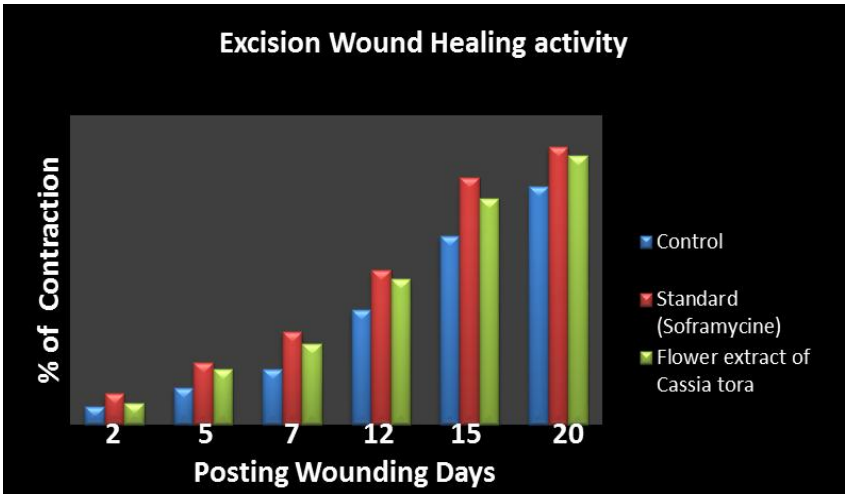
++, Moderately Present, + Poor Present, - Absent

Table 02: Excision wound healing activity in ethanolic flower extract of *Cassia tora*.

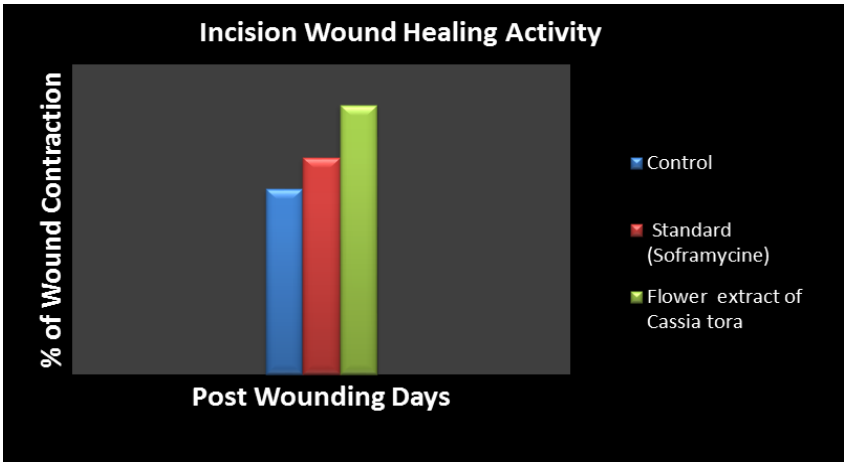
Groups	Wound contraction Mean ±SE					
	2nd day	5th day	7th day	12th day	15th day	20th day
Control	2.87±0.43	5.93±0.81	12.41±1.4	22.63±1.7	43.07±4.2	77.51±4.5
Standard(Soframycine)	14.11±0.83	21.14±2.3	27.7**±2.6	57.3*±3.1	77.23*±4.7	86.53**±4.1
Ethanolic flower extract ointment treated group	6.26±0.716	14.27±1.105	22.6*±1.71	43.37±3.7	63.03*±4.7	81.7**±3.6

Table 03: Tensile strength of incision model in ethanolic flower extract of *Cassia tora*.

Tensile strength Mean±SE day		
Control	**Standard**	**Extract**
63.41± 4.33	87.37±2.07	71.43 ±2.12



Graph 1: Excision wound healing activity of ethanolic flower extract of *Cassia tora*.



Graph 2: Incision wound healing activity of ethanolic flower extract of *Cassia tora*.

CONCLUSION

Wound healing activity of *Cassia tora* ethanolic flower extract was studied by Incision and excision wound model using Wistar Rats. Various parameters like wound area, % wound closure, period of epithelization and tensile strength was studied. The results of the present study suggest that local application and systemic administration of ethanolic flower extract has shown significant wound healing activity in excision and incision wound models and support the popular use of the plant to open wound in folk medicine. The presence of phytoconstituents like alkaloids, flavonoids, saponins, phenols either individually or combined may exhibit the synergistic effect towards the healing of wounds.

ACKNOWLEDGEMENT

The authors are very thankful to Jeypore College of Pharmacy and staff members for providing facilities to carry out the research work and also thank to the Biju Patnaik Medicinal Plants Garden and Research, Jeypore, Koraput (District), for providing valuable information about the plant and its identification.

REFERENCE

1. Tripathy KD: Essential of Medical Phamacology, Jeypee Brothers, Medical Publishers Ltd., New Delhi, India, Edition 3 rd, 2003: 532-42.
2. Hoffman,M.(n.d.).Picture of the Skin. Retrieved, 2017; 3. http://www.webmd.com/skinproblems-and-treatments/picture-of-the-skin#1.
3. G. S. Sidhu, H. Mani, J. P. Gaddipati et al., “Curcumin enhances wound healing in streptozotocin induced diabetic rats and genetically diabetic mice,” Wound Repair and Regeneration, 1999; 7(5): 362–374.
4. Dubey, R. B. & Sawant, B. S. Pharmacognostic Study of Cassia Tora L.: a Review. J. Pharm. Sci. Innov, 2015; 4: 208–211.
5. Huang KC. antihbs In: Hyperchlolesterolemic Herb: The Pharmacology of Chinease Herbs. CRC Press, Boca Raton, FL, 1993; 103.
6. G. Das, D. Ojha, B. Bhattacharya, M. Samanta, S. Ghosh, S. Datta, A. Samanta, journal of Phytology, 2010; 2(5): 64–72.
7. L.M. Perry, Medicinal plants of East and Southeast Asia: attributed properties and uses. (MIT Press, Cambridge. Mass. U.S.A), 1980.
8. Reddy, S. K., Gnananath, K., Kumar, S. A., Kumar, V. D. & Krishna, B. Evaluation of in vivo wound healing potential of Cassia roxburghii leaves extracts. Der Pharm. Sin, 2011; 2: 32–38.
9. Kokate CK, Purohit AP and Gokhale BS: Pharmacognosy, Nirali Prakashan, Pune, Edition 47th, 2008; 324-28.
10. Govindappa M, Bharath N, Shruthi HB and Sadan TS: Antimicrobial, antioxidant and in-vitro anti-inflammatory activity and phytochemical screening of Crotalaria pallida Aiton. African Journal of Pharmacy and Pharmacology, 2011; 5(21): 2359-71.
11. E. Varoglu, B. Seven, K. Gumustekin, O. Aktas, A. Sahin, and S. Dane, “The effects of vitamin e and selenium on blood flow to experimental skin burns in rats using the 133Xe clearance technique,” Central European Journal of Medicine, 2010; 5(2): 219–223.
12. Richarden M: Acute wound: an overview of the physiological healing process. Nurs Times, 2004; 100: 50-53.
13. Anand E, Galpalli N and Selven VK: Antiepileptics. Drug Screening Methods (Preclinical Evaluation of new Drugs), New Delhi: Jaypee Brothers Medical Publishers (P) Ltd., Edition 2 nd, 2009: 589-92.
14. Parmer NS and Prakash S: Evaluation of drugs acting on central nervous system. Narosa Publishing House Pvt. Ltd; New Delhi, Edition 1st, 2006; 289-92.
15. Bolton S: Pharmaceutical Statistics-Practical and Clinical Application. New York: Marcel Dekker, Edition 3 rd, 1997; 213-65.
16. Bolton S: Pharmaceutical Statistics-Practical and Clinical Application. New York: Marcel Dekker, Edition 3 rd, 1997; 213-65.