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Research Article

Pharmacological Action Of Polyherbal Gel For Wound Healing Activity On Albino Wistar Rat

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ABSTRACT

The aim of present study to formulate evaluate to check wound healing activity of newly prepared polyherbal formulation gel which consist of hydroalcoholic extract of the plants used are Moringa (Moringa oleifera), Kurdu (Celosia argentea), Durva (Cynodon dactylon) was formulated as gel and the hydroalcoholic extract was prepared by soxhelet method. These formulation were evaluated for the following parameters: pH, spreability, grittiness, skin irritation study, stability. The wound healing activity is assessed by rate of wound contraction , period of epithelisation ans skin breaking strength.

INTRODUCTION

Herbal medicines are used from the old ages like ayurveda, siddha,etc for the primary health care. It includes in using the plant material and plant extract for the therapeutic uses. Herbal medicines is growing techniques nowadays as it contains less side effects and is easy and safe to use. Herbal plants are rich source of therapeutic agents used in treatment and prevention of the disease. Including other dosage form herbal drug are also available in the form of the gel which is semisolid preparation used topically for various purpose like anti-septic, anti-healing, emollient. Wound healing is a complex biological process in which the injury is repaired by the properties like anti-inflammatory, anti-septic, anti-bacterial, etc . Several medicinal plants has been used from the ancient times for various wounds and burns. There are some common plants used from ancient times are Curcuma longa, Aloe vera, azadirachta indica, Ocimum sanctum, Pterocarpus santelinus, Carica papaya, Ficus bengalensis, Symplocos racemosa, Rubia cordifolia, Ficus racemosa, Glycyrrhiza glabra, Berberis aristata, Centella asiatica, Euphorbia nerifolia these plants have been reported in ayurveda, siddha, unani system of

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medicine for wound healing. Wound infection is one of the prevalent disease in various countries due to poor hygienic condition. Wound is any disruption of or damage to living tissue, such as skin, mucous membranes, or organs[1]. Healing of wound is necessary for restoration of disrupted skin . Wound healing start from the moment of injury or tissue damage and it has a various stages or phase for wound healing are 1)homeostasis phase 2)inflammatory phase 3)proliferative phase 4) remodling phase. In India various herbal medicibes are used in treatment and cure of various disease like wound healing, leprosy, skin disease, ulcer, diarrhoea, inflammation etc. more than 80% of peoples depends on traditional medicines for various skin disease. A wide number of plants are used by traditions in India for treatment of wounds and cuts.

Plants used

Kurdu

Synonyms :-

Red fox , feather cockscomb, woolflower, red spinach etc.

Biological source:-

kurdu is derived from plant Celosia argentea

Family:-

Amaranthaceae

Chemical constituents :-

amino acid like CelogenamideA, Moroidin , aspartic acid, Leaves contain citrusin C , infican.

Moringa:

Common Names:

Drumstick tree, Horse radish tree

Biological Source:

Moringa consists of the dried leaves of Moringa oleifera Lam., also known as Moringa oleifera (munga).

Family :-

Moringaceae

Chemical constituents:-

It is rich in vital minerals like iron, potassium, calcium, copper, zinc, magnesium, and manganese. It also contains various vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates

Durva grass:-

Synonyms:-

Ethana grass, Dubo, Dog grass.

Biological source:-

it obtained from the plant of Cynodon dactylon

family :

Poaceae

Chemical Constituents:

including acetic acid, alkaloids, arundoin, carbohydrates, fats, ferulic acid, coumaric acid, fiber, flavones, glucosides, hydrocarbons, lignin, magnesium, palmitic acid, proteins, selenium, sodium, triterpenoids, vanillic acid, vitamin A.

MATERIAL AND METHOD-

collection of plant material:-

leaves are collected from local areas of junnar pune

Materials and Method:

Plant Material Collection:

Leaves from plants in the local area of Pune were collected for the study.

Animal Model:

Healthy adult Albino Wistar Rats weighing between 150-250 grams were utilized for the study. These rats were procured from the animal facility at Vishal Institute of Pharmaceutical Education and Research, Ale, Pune, India. Upon arrival, the rats were randomly placed and assigned to different treatment groups in polypropylene cages lined with paddy husk bedding. The housing conditions maintained a temperature of 24±2°C, relative humidity between 30-70%, and followed a 12hr light 12 hr dark cycle. Throughout the study, the rats had access to water and were fed with standard commercial pelleted rat chow . All experimental procedures and protocols adhered to the guidelines of the Institutional Animal Ethics Committee and were in compliance with CPCSEA regulations.

Preparation of extract :

The leaves of the Moringa plant were collected, washed, and left to dry in the shade for 6 days. Once dried, they were ground into a powder. The powder extracted through Soxhlet appartus for extraction process. After that, the Hydro-Alcoholic extract was collected and concentrated to obtain a dark green residue. This extract was then stored in an airtight container in a cool, dark place. The same process was followed for Kurdu and Durva leaves, resulting in a similar blackish-green extract stored in a cool, dark place in an airtight container.

Formulation of PolyHerbal gel :

Table 1: Formulation of Gel base

Sr. No.	Name of ingredient	Quantity to be taken
1.	Sodium CMC	3 g

Table 2: Formulation of Polyherbal gel

Formulation	Moringa (in mg)	Kurdu (in mg)	Durva (in mg)
1.	210	5	3
2.	220	10	6
3.	230	15	9

Procedure for preparation of Polyharbal Gel :

1. Intially Gel base was prepared by weighing accurately grated Sodium CMC (3g) with 100ml water with continuous stirring by mechanical stirrer with stable frequency rate. Mixing homogenously the mixture of Sodium CMC and distilled water the gel base was prepared.
2. Polyherbal Gel was prepared by mixing accurately weighed Moringa, Kurdu and Durva extract with DMSO to the Gel base by continuous stirring method to prepare a smooth Gel paste, stir continuosly until to form homogeneous gel, than finally transferred in a suitable container.

Fig no 1 Mechanical stirrer

Fig no 2 Extracts (Formulations)

Evaluation-

Colour and odour:

Physical parameters like colour and odour were examined by visual examination.

Consistency:

Smooth and no greediness is observed on examination.

PH:

PH of prepared herbal gel was measured by using PH paper. The solution of gel was prepared by using 100ml of distilled water and was set aside for 2hours. For each solution ph was determined in triplicate and the average value of the three was considered for examination.

Neutral PH was observed after PH paper test in all 3 gels.

Spreadability:

The spreadability was determined by placing excess of sample in between two slides which was compressed to uniform thickness by placing a definite weight for definite time .The time required to separate the two slides was measured as spreadability. Spreadability was calculated by following formula-

$$S=M\times L/T$$

Where,

S= spreadability

M= weight tide to the upper slide

L= Length of glass slide

T= Time taken to saperate the slides

Good spreadability was observed after examination.

Diffusion study :

The diffusion study was carried out by preparing agar nutrient medium. Ahole board at the centre of medium and gelwas by placed in it . The time taken by gelto get diffused through was noted.(After 60 minutes)

LOD:

LOD was determined by placing the formulation in petri dish on water on bath and dried for the temperature 105˚C.

Solubility:

Soluble in boiling water, soluble in alcohol.

Boiling water

Alcohol

Wash ability:

Formulation was applied on the skin and then ease extends of washing water was checked.

After test it is determined that it is easily washable.

Non-irritancy Test:

Herbal gel prepared was applied to the skin of human being and observed for the effects.

After test it is observed that the gelis non-irritant for skin.

Pharmacological evaluation:-

Firstly animal were wounded under mild choloform anaesthesia with using partial aseptic techniques. The animals were divided into 4 groups (n=4).

Group I was treated with standard formulation (cipladine) treatment.

Group II was treated with test formulation 1.

Group III was treated with test formulation 2.

Group IV was treated with test formulation 3.

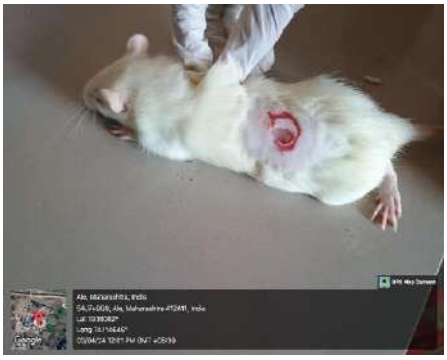
These all groups was treated only with the mentioned treatment and not any another preffered study. (for the formulation concentration refer table 2).

Table 3: Groups of the animals

Group I	Standard formulation	4 animals
Group II	Formulation 1	4 animals
Group III	Formulation 2	4 animals
Group IV	Formulation 3	4 animals

Standard (Day 1)

Formulation 1(Day 1)



Formulation 2(Day 1)

Formulation 3(Day 1)

Standard (Day 5)

Formulation 1(Day 5)

Formulation 2(Day 5)

Formulation 3(Day 5)

Standard (Day 13)

Formulation 1 (Day 13)

Formulation 2 (Day 13)

Formulation 3 (Day 13)

A. Excision wound model-

Hairs were eliminated from the central region of the dorsal thoracic area rats under anesthesia; skin removed fully. An area was cut out to create a wound that was approximately 2cms in size. The wound was wiped with a cotton swab that had been dipped in alcohol . The three experimental formulations and cipladine were also tested and administered to the wound twice a day for two weeks beginning on the measurement of wound contraction was done on the initial day of injury for a duration of 2 weeks with a gap of 5 days between each interval.

B. Statistical analysis-

The results were reported as the mean plus or minus the standard error of the mean (SEM) Examined through student's t-Test and subsequently Turkey's test. A P-value less than 0.01 was deemed to be significant.

RESULT AND DISCUSSION-

Table 4: Result of Physical Characteristics

Sr. No.	Plant Name	Part Use	Odour	Taste	Colour
1	Kurdu	Leaves	Characteristics	Bitter	Green with pink tinge
2	Durva	Leaves	Characteristics	Pungent, Bitter	Green
3	Moringa	Leaves	Unpleasant	Bitter	Green

Table 5: Result of Preliminary Phytochemical Screening of Extract

Sr. No	Test	Plant Extract		
		Kurdu	Durva	Moringa
1	Alkaloids	+	+	+
2	Glycosides	+	-	+
4	Flavonoids	+	+	+
5	Phenolic compounds	+	-	+
6	Saponins	+	+	+
7	Tannins	-	+	+
1	Alkaloids	+	+	+

Test for Flavonoids

Test for Tannins

Test for Alkaloid

Table 6: Physicochemical Evaluation of Formulated Gel

Physicochemical Parameters	Observation
Colour	Greenish yellow
Odour	Characteristics
Consistency	Smooth
Ph	6.8
Spreadability	Good
Solubility	Soluble in boiling Water Soluble in alcohol
Washability	Good
Non-irritancy	Non irritant
Stability	Stable

CONCLUSION:-

From the ancient time kurdu, durva and moringa is used for their various medicinal properties like, anti healing, ant diuretic, treat ulcer , skin disease etc. Thus this gel become a media to use these medicinal properties effectively and easily as a simple dosage form. Most of the population supportable herbal medicine which is safer or few side effects instead of the synthetic. Polyherbal preparation is non toxic , safer and have less side effects which improves patients compliance as it contains herbal ingredients. Kurdu , durva , moringa is used for their various medicinal properties like, anti healing, anti diuretic, skin eruption, etc. Thus this gel could become a media to use these medicinal properties effectively and easily as a simple dosage form. In presentstudy the polyherbal gel is showing better results than standard.

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