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Research Article

Formulation And Evaluation Of *Tridax Procumbens* Emulgel

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ABSTRACT

The present study reveals vial information on anti-bacterial and blood clotting activity on the tridax procumbens L. (Asteraceae) medicinal plant. The present study on phytochemical analysis on the plant is essential. Herbal gel is used in many years but some problems are occurred in emulgel formulations so novelty preparation ie emulgel formulation which are shows better thickness and spreadability with activity. The combination of emulsion and gel then the formation of emulgel formulation which is give semisolid topical dosage form at least two constituents. It has an easy application, easy removal property. It is widely used in dosage form an it has more patient compliance. Tridax procumbens is anti- bacterial drug. Use of plant for the treatment of certain bacterial infections which are caused due to E. coli, S. aureus as shown effect. The present study to investigate phytochemical present in the leaves extract of Tridax procumbns. Initially dried powder of tridax procumbens was extracted by decoction method and perform test for presence of different phytochemical. The present rsearch has been undertaken with the aim to formulate and evaluate the herbal emulgel containing Tridax procumbens leaves extract.The aim of present study was to prepare herbal emulgel formulation containing extract of Tridax Procumbens aerial plant parts for wound healing and blood clotting activity. Emulgel was prepared by using Tridax Procumbens extract, carbopol 940, propylene glycol, methyl paraben, propyl paraben, ethanolamine and required amount of distilled water. Prepared emulgel formulations were evaluated for physical appearance, pH, drug content, spreadabilty, viscosity, homogeneity, and grittiness.

INTRODUCTION

A large number of medicinal plants belonging to the family Asteracea contain chemical compounds exhibiting antimicrobial activity. A number of synthetic drugs produced from pharmaceutical industries from time to time have laid to develop resistant microorganism that becomes major global issue in the treatment of infectious diseases.

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The antimicrobial formulations of plant origin have been proved to be effective with lesser side effects . The family Asteracea includes about 25 thousands species, many of which are reach in secondary metabolites with biological activity . The aerial part of different species of genus Ashillea are widely used as a folk medicine due to numerous pharmacological properties such as anti-inflammatory, anti-oxidant, anti-plasmodic and antihemorrhoidal . Extract from natural dried leaves of Eupatorium sp. posses with antibacterial and ant malarial activity. Tridax sp. in commonly used in the indian traditional medicine as anti coagulant. Tridax procumbens is a perennial herbal plant belongs to family Asteraceae native to central and south America. It is also known as Coat buttons. Since ancient times, this species is used in Ayurveda in India. Some of the medicinally important species of genus Tridax are T. angustifolia, T. bicolour, T. dubia, T. erecta. The plant contains yellow centered white flowers and the leaves are basically arrow shaped. The fruit have stiff hairs. Topical drug delivery refers to the application of a drug-containing formulation to the skin to treat a cutaneous condition. This system is used when other routes of drug administration (such as oral, sublingual, rectal, and parental) fail, or when a local skin infection, such as a fungal infection, occurs . Topical drug administration is a common treatment method for both local and systemic conditions. In the topical delivery system, the drug is absorbed by the skin and reaches the site of action to provide a therapeutic effect. The rate of drug release from a topical preparation is dependent directly on the physiological features of the carrier 2. The primary benefit of a topical delivery system is that it avoids the first-pass metabolism. The term microemulsion is based on particle size. Due to their smaller size, the drug particles can easily diffuse through the skin and reach their site of action. The gel will hold the microemulsion for a long time and will aid in the sustained release of the drug. Various fungal infections are growing nowadays which are a major problem for society. Fungal infections such as Tinea capitis, Tinea pedis and Tinea corporis infect the skin severely. A technique such as emulgel can aid in the easy penetration of the drug into the skin and provide a rapid onset of action. Emulgel systems are currently attention to the pharmaceutical sectors because of their substantial potential to act as drug delivery vehicle by incorporating a broad range of drug molecules and higher stability compared to the other dosage form like cream, lotion, gel, etc. Emulsions are either available in an oil in water or water in oil type. These are prepared by the incorporation of the emulsion into the gel with constant stirring at a moderate speed. Incorporation of emulsion into a gel makes it a dual control release system, thereby, increasing its stability. It has better drug release if we compare to other topical drug delivery system. It is non greasy because of the presence of gel phase which enhances patient compliance. Gels has a major limitation for the delivery of hydrophobic drugs, so to overcome this limitation an emulsion based approach is being used so that even a hydrophobic therapeutic drug can enjoy the unique properties of emulgels. In recent years, these have also been a great interest in the use of novel polymers. These emulgels are having major advantages on vesicular drug delivery systems as well as on conventional systems in various aspects. Various permeation enhancers can enhance the effect; due to this emulgels can be used as better topical drug delivery systems over current drug delivery systems. The emulsion can be use for analgesics and antifungal drugs.

MATERAILS AND METHODOLOGY:-

Plant Profile: Kurmudi(Dagadi Pala)

Fig no 1: Tridax procumbens plant

MONOGRAPH

Scientific name –

Tridax procumbens

Kingdom –

Plantae

Order-

Asteroids

Family –

Asteraceae

Tribe –

Heliantheae

Genus –

Tridax

Species –

T. Procumbens

Common names

Coat buttons and Tridax – English, Jayanthi - Kannada, cadillo chisaca - Spanish, herbe caille – French, Jayanti Veda – Sanskrit, Ghajadvu - Gujarati, ghamra - Hindi, Tridhara - Bengali, bishalya karani- Oriya, kambarmodi, Jakhamjudi - Marathi, Gaddi chemanthi – Telugu.

Synonyms

Chrysanthemum procumbens, Balbisia canescens, Balbisia divaricata, Tridax procumbens var. canescens, Tridax procumbens var. ovatifolia, Balbisia elongate .

Geographical source

Tridax procumbens as a widespread weed and blighter plant. it's native to the tropical Americas, however it's been introduced to tropical, semitropical, and gentle temperate regions worldwide. it's listed as a pernicious weed within the us and has blighter standing in 9 states .

Morphological Characters

Tridax procumbens could be a perennial herb that incorporates a crawl stem which might reach from to 8-30 inches (20-75 cm) long. The leaves of Tridax procumbens area unit opposite, pinnate, rectangular to ovate, and 1-2 inches (2.55 cm) long with wedge-shaped bases, coarsely serrate margins, and acute apexes. Tridaxprocumbens flowers have white rays and yellow disk flowers. They're regarding zero. 40.6 inches (1-1.5 cm) wide, and remained a 4-12 inches (10-30 cm) long stalk. Flowering happens in spring. Fruits area unit achene's that area unit dark brown to black in color, oblong, and 0.08 inches (2 mm) long, every with a head of calyx bristles that adjust from zero.12-0.24 inches (3-6 mm) long. Tridax procumbens is listed as a Federal pernicious Weed. It prefers coarse-textured soils in additional tropical locations. It invades roadsides, crops, waste land, and fallow land. It's native to Mexico and South America, however has become AN invasive drawback round the world.

Microscopical Characters Leaf

Transverse section (T.S.) of leaf showed Dorsiventral, stratum single superimposed on each the surfaces and and slightly Protuberated on dorsal size. Trichomes were of Covering kind that square measure straightforward, multicelled (3-6 Celled) and additional in variety on dorsal aspect. The Basal cells of the trichomes were swollen and Trichomes seemed like claw. Meristeel consists of Single centrally situated collateral vascular strand encircled by some parenchymatous Cells stuffed with dark content. T.S. passing Through the stratified region shows single superimposed Palisade cells slightly below the stratum followed

by 5-7 celled mesophylls, parenchyma principally empty of animate thing areas

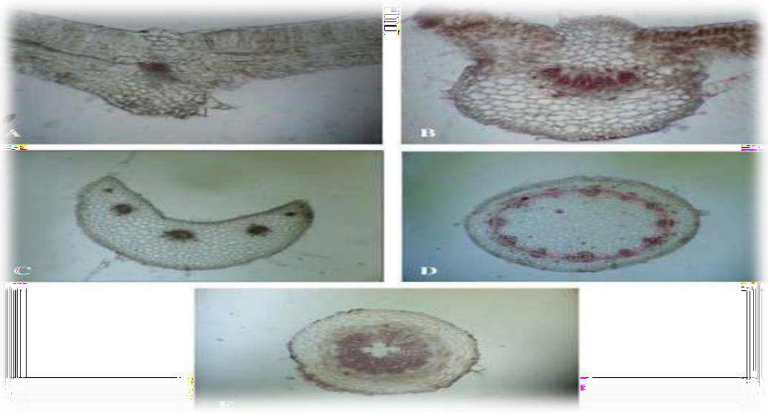

Figure no 2: Micrscopical charters of tridax procumbens linn

Medicinal Uses:

Anti-bacterial

Blood clotting activity

Wound healing

Anti-Fungal activity

Anti-microbial

Table no 1:List of chemical constitents of tridax proumbens

Chemical Constituent	Phytoconstituent
Flavonoid	Kaempferol, catechin and its derivatives, Puerarin, Escluetin, Butein
Alkaloid	Akuammidine, , Ferulic acid, Tannins, Stigmasterol,
Other Phytochemicals	Caffeic acid, Ferulic acid, Tannins, Stigmasterol, Carotenoids,

Methodology:-

Formulation table:-

Table No.2: Formulation of emulgel

Sr. No.	Ingredients	F1	F2	F3	F4	F5
1	Extract	5ml	5ml	5ml	5ml	5ml
2	Carbopol	2gm	1.5gm	1gm	1.5gm	1gm
3	Propylene glycol	1ml	1.5ml	1ml	1ml	1.5ml
4	Methyl paraben	1ml	1ml	1.5ml	1.5ml	1ml
5	Propyl paraben	1ml	1.5ml	1.5ml	1ml	1ml
6	Glycerin	1ml	1ml	1.5ml	1ml	1.5ml
7	Triethanolamine	q.s	q.s	q.s	q.s	q.s
8	Water	q.s	q.s	q.s	q.s	q.s

Procedure:-

Collection Of Plant Material

Fresh leaves of tridax procumbens were collected. The leaves were washed under running tap water. Then the leaves were shade dried for about 2-3 weeks. The dry leaves were homogenized to fine powder or coarse powder and stored it .

Preparation of extract

Collected tridax procumbens leaves of shade dried plant materials were 10 g powdered and extracted with 100 ml of 100% ethanol and allowed digestion for 72 hours. The resultant extract was concentrated and separated in to a 250 ml iodine flask.

Preparation of Emulgel:-

Required quantity of carbopol was taken and 20ml of water was added in it; it was stirred at 300-500RPM in a homogenizer for 15 minutes. After achieving a sticky consistency add triethanolamine and more 10ml of water. Again it was stirred at higher than 500RPM. After another 20 minutes a gel base was formed then Tridax procumbens extract was added; and it was further stirred for 10 minutes at higher rpm, Propylene glycol, Propyl Paraben and methyl paraben were further added in geometric proportions to yield a homogenous gel. Add glycerine in the formulation and stirred for 10 minutes to proper mix up.

Finally this whole mixture was stirred for another 45 minutes with small incremental addition of water.

Figure no 3: Herbal emulgel formulation

Evaluation Parameters:-

Phytochemical screening of tridax procumbens leaves

The phytoconstituents present in the Ethyl alcohol extracts of leaves Tridax procumbens were analyzed qualitatively by using standard procedures

Test for Alkaloids

About 2 ml of extract was taken and added 2 ml of concentrated HCL and then Mayer's reagent was added drop wise. The formation of white precipitate indicates the presence of alkaloids

Test for Flavonoids

The extract of 0.1 ml was taken and made up to 5 ml with distilled water, after which 0.3 ml of sodium nitrate was added and incubated for 5 mins at room temperature and then added 3 ml of 10% aluminium chloride which is incubated for 6mins at room temperature. Finally, 2ml of sodium hydroxide (NaOH) was added. The formation of yellow color indicates the presence of flavonoids.

Test for Saponins

About 2ml of filtrate was mixed with 1ml of distilled water and shaken vigorously for about 3 seconds and it was allowed to stand for few mins and then added 3 drops of olive oil and shaken vigorously. Formation of emulsion indicates the presence of saponins.

Test for Terpenoids

About 1ml of the extract and 2ml of chloroform was taken and followed by the addition of 5ml of concentrated H_2SO_4 along the sides of the test tubes. Formation of a reddish-brown coloration in the interphase indicates the presence of terpenoids.

Test for Phenolic Compounds

To 1ml of extract, 1ml of Iron (III) chloride was added and mixed well. A deep blue green color was formed which indicates the presence of phenolic compounds.

Test for Quinones

To 2ml of plant extract, 1ml of concentrated H2SO4 was added. Formation of red color indicates the presence of quinones.

Test for Steroids

To 10 mg of plant extract, 2ml of acetic anhydride and followed by 2ml of H2SO4 were added. Formation of violet or blue color indicates the presence of steroids.

Test for Tannins

To1ml of the extract added 0.1% of ferric chloride solution and observed brownish green or a blue-black coloration which indicates the presence of tannins.

Test for Glycosides

About 1ml of extract was treated with 2ml of glacial acetic acid containing one drop of ferric chloride solution. This was underplayed with 1ml of concentrated sulphuric acid. A brown ring at the interface indicates deoxysugar which confirms the presence of cardenolides. A violet-green ring appearing below the brown ring in the acetic acid layer indicates the presence of glycosides.

Test for Coumarins

The extract was dissolved in methanol and then added alcoholic NaOH. A yellow color appears which later disappears on addition of drops of concentrated HCl indicates the presence of coumarins.

Evalution parameters :

1. Organoleptic Characters:

when evaluating food or beverages, organoleptic characteristics include factors like flavor, aroma, color, texture, and mouthfeel. These characteristics play a significant role in determining the overall quality and consumer acceptance of a product.

2. Determination Of pH:

A digital pH metre was used to determine the pH of the formulation. One gram of formulation was dissolved in one hundred millilitres de-mineralized water and stored for two hours. The pH of the formulation was measured in triplicate. Before use, the instrument was calibrated with standard buffer solutions at pH 4, 7, and 9.

3. Spreadability:

Spreadability refers to how far the emulgel spreads after being applied to the skin or affected area. The spreading value of an emulgel formulation also influences its bioavailability efficiency. The spreadability of semi-solid preparations was determined using the parallel plate method, widely used for determining and quantifying spreadability.

4. Viscosity:

The viscosity of the polyherbal emulgel was measured at 10 rpm using a Brookfield viscometer, model DV-||+pro. 20 grams of the gel were taken in a beaker, and the spindle No. 64 was immersed for about 5 minutes before taking the reading.

5. Grittiness:

All the formulations were evaluated miscroscopically for the presence of any appreciable particulate matter which was seen under light microscope. Hence obviously preparations fulfils the requirements of freedom from particulated matter and from grittiness as desired for any topical preparations.

RESULT AND DISCUSSION:-

Table no. 3: Phytochemical screening

Name of the phytoconstituent	Ethanol Extract
	Leaves
Alkaloids	(+)ve
Flavonoids	(+)ve
Saponins	(-)ve
Terpenoids	(+)ve

Phenolic compounds	(+)ve
Triterpenoids	(-)ve
Quinones	(-)ve
Steroids	(+)ve
Tannins	(-)ve
Glycosides	(-)ve
Coumarins	(+)ve

Table No. 4: Evaluation parameter of herbal emulgel

Sr. No.	Parameters	Observation				
		F1	F2	F3	F4	F5
1	Appearance	Turbid	Turbid	Turbid	Turbid	Transparent
2	Colour	Light white	White	Dark white	Yellowish white	Yellowish white
3	PH	6.8	6.9	7.0	5.4	5.9
4	Spreadability	16.25mm	15.48mm	14.13mm	13.14mm	15.47mm
5	Viscosity	18600cp	7980cp	4820cp	5200cp	7690cp
6	Grittiness	No	No	No	No	No
7	Homogeneity	Homogenous	Homogenous	Homogenous	Homogenous	Homogenous

CONCLUSION:-

The present study Formulation F5 batch has shown craved result therefore this emulgel formulation can be used as antibacterial and wound healing activities. . The phytochemical present in the different compound and it is active so their bioactive compound for different therapeutic properties. Natural remedies are more acceptable in the belief that they are effective with lesser side effects then the synthetic ones. Herbal formulations have growing demand globally. It is a very good attempt to establish the herbal emulgel formulation containing extract of Tridax Procumbens. Natural remedies are more acceptable in the belief that they are effective with lesser side effects then the synthetic ones. Herbal formulations have growing demand globally. It is a very good attempt to establish the herbal gel formulation containing extract of Tridax Procumbens. This study revealed that the developed herbal formulation F5 was comparatively better than other batches of formulation.

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