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FORMULATION AND EVALUATION OF ANTIBACTERIAL CREAM BY USING TRIDEX PROCUMBENCE AND NUTMEG FOR RITTERS DISEASE

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ABSTRACT:

The goal of the study was to formulate a cream with composition for treating bacterial skin infection and which enhance skin properties. Definition has a place to a therapeutic cream that has two anti-bacterial dynamic components. It reveals a formula for treating bacterial skin infections, as well as other components that can help improve skin issues. For skin diseases, the topical approach is the leading choice. .. Because of the numerous advantages over traditional uses the development of topical drug delivery systems with systemic effects appears to be advantageous for a variety of medications. Tridex procumbence and Nutmeg are the active Herbal ingredients used to treat Bacterial skin infections. It may show antimicrobial and anti-inflammatory properties It also includes, waxy materials, solvents, preservatives, and water in the cream base. When the active components are combined, they provide a potent antibacterial effect. Several experiments were done on the basis of method and result we conclude that the drug giving [how many percentages of drug giving effect] to assess the physicochemical characteristics of formulated cream, such as visual inspection, pH measurement, Spread ability, etc. The sedated cream was great in consistency and color..

This study focuses on the ritter disease by skin lesions and bacterial infection, poses a challenging for effective treatment. The disease primarily affects children under the age 5 years, but it can also occur in adults. The finding highlights the potential of Tridex procumbens and nutmeg use to treat ritters disease.

Keywords : Tridax procumbence , Nutmeg ,Antibacterial activity ,Staphylococcus aureus

INTRODUCTION:

Staphylococcal singed skin disorder (SSSS) may be a uncommon but extreme skin contamination caused by the exfoliative poisons delivered by the bacterium Staphylococcus aureus produced by the bacterium Staphylococcus aureus.

Theinfection, moreover known as Ritter's malady, is named after Gotfried Ritter who distributed case arrangement of around 300 patients with SSSS within the 1800s patients with SSSS in the 1800s .

Staphylococcus aureus is a significant cause of serious bacterial infections especially sepsis where it is commonly reported .

It is a significant public health concern due to its potential to cause significant morbidity and mortality, especially in infants and in immunocompromised individuals.

The disorder is characterized by a range of diffuse erythematous hasty and skin peeling, which can lead to life-debilitating complications . . It basically influences children beneath the age of 5 a long time, but can moreover happen in grown-ups. . The pathogenesis of SSSS is complex and includes the breakdown of desmoglein-1 show within the external layer of the skin by the exfoliative poisons delivered by S. aureus . This results in the detachment of the top layer of the skin, causing the characteristic bliste-ring and peeling seen in SSSS .

Diagnosis of SSSS is challenging and requires a high degree of clinical suspicion as the early stages of the disease can be easily mistaken for other common childhood illnesses such as pemphigus vulgaris and StevensJohnson syn-drome.

Treatment typically involves suppor-tive care, wound management, and antibiotics targeting the underlying S. aureus infection.

Layers of Epidermis : -The layers of the epidermis incorporate the stratum basale (the most profound parcel of the epidermis), stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum (the foremost stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum (the most superficial portion of the epidermis).

Stratum basale, also known as stratum germinativum, is the deepest layer, separated from the dermis by the basement membrane (basal lamina) and attached to the basement membrane by hemidesmosomes.

The cells found in this layer are cuboidal to columnar mitotically active stem cells that are constantly producing keratinocytes.

This layer also contains melanocytes. Stratum spinosum, 8-10 cell layers, moreover known as the prickle cell layer contains sporadic, polyhedral cells with cytoplasmic forms, some of the time called "spines", that amplify outward and contactby desmosomes. cytoplasmic processes, sometimes called "spines", that extend outward and contact neighboring cells by desmosomes.

Dendritic cells can be found in this layer. Stratum granulosum, 3-5 cell layers, contains diamond shaped cells with keratohyalin granules and lamellar granules.

Keratohyalin granules contain keratin antecedents that in the long run total, crosslink, and frame bundles.

Stratum lucidum, 2-3 cell layers, show in thicker skin found within the palms and soles, may be a lean clear layer comprising of eleidin which could be a change item of keratohyal

Dermis :-The dermis is **associated** to the epidermis at the level of the **storm cellar film** and **comprises** of two layers,of connective tissue, the papillary and reticular layers which merge together without clear demarcation Hypodermis : - The hypodermis is profound to the dermis and is additionally called subcutaneous belt. It is the most profound layer of skin and contains fat lobules beside a few skin members just like the hair follicles,tactile neurons, and blood vessels. .

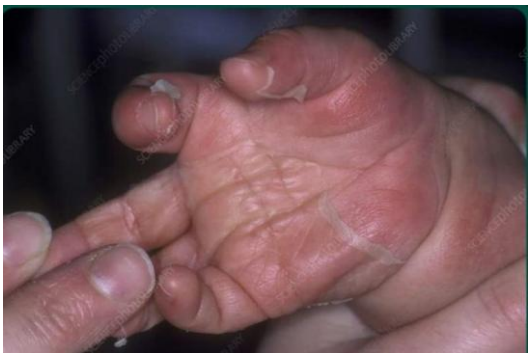

Fig1: -Ritter Disease (infantas)

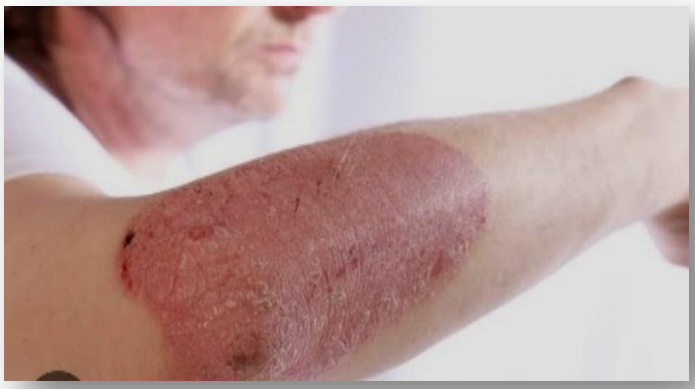

Figure2 ;Ritters Disease [Adult]

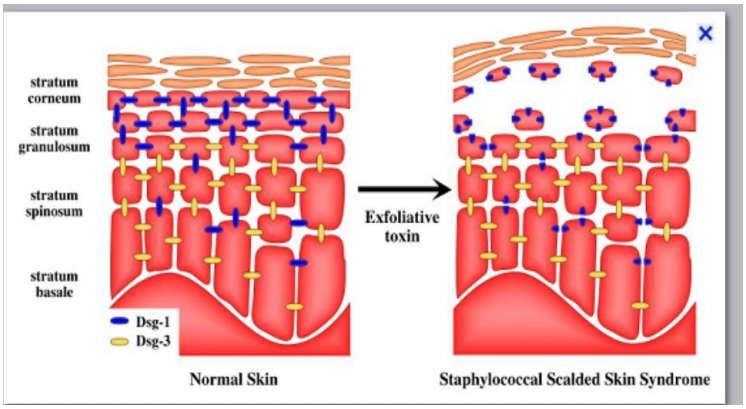

Fig3: -Pathophysiology of Ritter Disease

Creams are the semisolid dosage forms and intended for topical application to the skin, placed on the surface of eye, or used nasally or rectally for therapeutic or protective action . These arrangements are utilized for the localized impacts delivered at the location of their application by sedate entrance in to the basic layer of skin or mucous layer. These items are planned to convey medicate into the skin in treating dermal disarran the underlying layer of skin or mucous membrane. These products are designed to deliver drug into the skin in treating dermal disorders, with the skin as the target organ.

Creams are semi-solid emulsions of oil and water. They are separated into two sorts:oil- in-water (O/W) creams which are composed of little beads of oil scattered in apersistent stage, and water-in-oil (W/O) creams which are composed of little beads of water scattered in a ceaseless sleek stage. Oil-in-water creams are more comfortable and cosmetically worthy as they are less oily and more effectively washed off utilizing water. Water-in-oil creams are more troublesome to handle but numerous drugs which are consolidated into creams are hydrophobic and will be discharged more promptly from a water-in-oil cream than an oil-in-water cream. .. Water-in-oil creams are also more moisturising as they provide an oily barrier which reduces water loss from the stratum corneum, the outermost layer .

TYPE OF CREAM

O/W emulsified type	W/O emulsified type
Vanishing cream	Cold cream
Foundation cream	Emollient cream
Shaving cream	

DRUG PROFILE:

NUTMEG :

Nutmeg is the seed, or the ground spice derived from that seed, of several tree species of the genus Myristica fragrant nutmeg or true nutmeg (M. fragrans) is a dark-leaved evergreen tree cultivated for two spices derived from its fruit: nutmeg, from its seed, and mace, from the seed covering. It is also a commercial source of nutmeg essential oil and nutmeg butter.

Nutmeg trees may reach a height of about 20 metres (65 feet). They yield fruit eight years after sowing, reach their prime in 25 years, and bear fruit for 60 years or longer. The fruit is a pendulous drupe, similar in appearance to an apricot. When fully mature it splits in two, exposing a crimson-coloured aril, the mace, surrounding a single shiny brown seed, the nutmeg. Dried nutmegs are grayish brown ovoids with furrowed surfaces.[3] The nutmegs are roughly egg-shaped, about 20.5- 30 mm (0.81-1.18 in) long and 15-18 mm (0.59- 0.71 in) wide, weighing 5-10 g (0.18-0.35 oz) dried .Nutmeg is rich in fiber, which helps keep the digestive system healthy and prevent blood sugar from spiking. It's also a source of: Vitamin A Vitamin C Vitamin Manganese Magnesium Copper Phosphorous Zinc

Ironong thin pointed beaked pods, which contain 10–20 oblong greenish-brown seeds.

Fig 4:- Nutmeg

Geographical source:

The pant native to the malaku island of Indonesia; however, it is extensively distributed to Grenada, India, Sri Lanka, Mauritius, South Africa, and the USA

Botanical Classification:

Kingdom : Plantae

Division : Tracheophyta

Class Magnoliopsida

Order : Magnoliales

Family : Myristicaceaemily Trifoliae

Genus : Myristica

Species : fragrans

Chemical Constituents of Nutmeg:-

Nutmeg contains of 5 to 15% volatile oil, lignin, stearin, starch, gum, colouring matter, and 0.08% of an acid substance. The volatile oil contains clemicine, myristicin, geraniol, borneol, pinene, camphene, and dipentene. It also contains eugenol, safrol, p-cymene and isoeugenol in small quantity.

Mechanism action of Nutmeg:- Ingested in small amounts as a spice, nutmeg produces no noticeable physiological or neurological response, but in large doses, both raw nutmeg freshly ground from kernels and nutmeg oil have psychoactive effects, which appear to derive from anticholinergic-like hallucinogenic mechanisms attributed to myristicine antioxidant, antimicrobial and central nervous system effects of nutmeg have also been reported in literature. Nutmeg is a rich source of fixed and essential oil,

glaze.

METHOD

Nutmeg was purchased from local market. Prepared a powder of nutmeg by using mortal pestle.

Extraction of Nutmeg:-

1. Weigh 10g of fine powder of Nutmeg.
2. Packed the powder in Filter paper create a thimble band fitted in Soxhlet apparatus.
3. Set up the soxhlet apparatus and maintain temperature at 60’C.
4. Filled/transfer the N hexane methyl acetate in apparatus by using funnel.
5. Placed the apparatus for 24hr.
6. Defatted powder was stored in air tight container to prevent degradation.
7. Defatted powder was extract with 80% ethanol at various interval in Ultrasonication bath.

Figure 5 Extraction of Nutmeg

Phytochemical screening of nutmeg

IDENTIFICATION TEST FOR ALKALOIDS:

1. Mayer’s test:-

Mayer’s reagent à Potassium mercuric chloride

Test:- 2g of Nutmeg powder + few drop of Mayer’s reagent :-Yellowish ppt

2**. Hager’s test: -**

Hager’s reagent à Saturated aqueous solution of Picric acid.

Test:-2g of nutmeg powder + few drops of Hager’s reagent à yellow ppt

3. **Drangendroff test:-**

Drangendroff reagent à Potassium Bismuth iodide

Test:- 2g of Nutmeg powder+ few drops of drangendroff reagent à Orange Red colour

4. Wagner test:-

Wagner reagent à Dilute iodide solution

Test:-2g of Nutmeg powder+ few drops of Wagner reagent à reddish brown ppt

5. Identification test for Saponin:-

Froth test:- 0.5g Nutmeg extract + 10 ml distilled water and heated to boil Frothing shows (cream miss bubble) presence of Saponin.

6 **Liberman-Burchard test**:- 2mg of Nutmeg extract was dissolved in acetic anhydride heated to boiling cooled and then 1ml of conc. Sulphuric acid was added along sides of test tube. Formation of green colour indicate presence of steroids.

TRIDEX PROCUMBENCE:

Family : Asterceae
Synonyms : Ptiloatephium kunth ,Mandonia wedd ,Bartolia adns .
Chemical constituents :alkaloids ,steroids ,flavonoids,minerals.
Medicinal use : bacterial infections , fungal infection , wound healing.s ; Procumbens.

fig6:- Tridex Procumbens

Chemical constituents

Tridax procumbens is a plant used majorly in Indian traditional medicine. This is rich in alkaloids, steroi-
-ds, carotenoids, flavonoids (such as catechins, centaurein and bergenins), fatty acids, phytosterols, tannins and minerals.

Mechanism Of Action

The methanolic extract of flowers of Tridax procumbens (L) has significant antibacterial activity against S. Aureus and E. coli. But staphylococcus aureus i.e. gram positive bacteria are more susceptible than Escherichia coli i.e. gram negative bacterial.

METHOD:

First, we identified and collect the plant flowers 0f tridex procumbens from the different localities of Nusery and its nearby areas and washed them thoroughly with distilled water. The cleaned plant parts are then allowed for the complete shade drying and then made to a fine powder with a mechanical grinder and stored in an air-tight container.
Extraction of Tridex procumbence

1. 1.The collected flowers of tridex procumbens were dried in shade for 7 days.
2. 2.After drying plant material was coarsely powdered and kept in a well-closed container.
3. 3.About 100gm of powder of plant flowers was taken in soxhlet apparatus for 72 hours and extracted with [45 to 55°c] ethanol.
4. The extract was stored at 4°c until further use for formulation.

Fig7:-Extraction Of Tridex Procumbens

Phytochemical screening of and tridex procumbence

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IDENTIFICATION TEST:

FIG[8] :- IDENTIFICATION TEST FOR NUTMEG PROCUMBENCE

FIG[9] :- IDENTIFICATION TEST FOR TRIDEX

Procedure Of Experimental Work

Preparation Of Cream

Sr.No	**Ingerdients**	**Quantity**	**Uses/Role**
1	BeesWax	**50ml**	Polymer matrix
2	Liquid Paraffin	**20ml**	Solvent
3	Borax	**10 Gm**	Stabilizer/Polymer
4	Methyl Parben	**10Gm**	Preservative b
5	Nutmeg Extract	**10ml**	Anti Bacterial
6	Tridex Procumbens	**10ml**	Anti Bacterial

7	Distilled Water	**Q.S**	_
8	Rose Water	**Q.S**	_

There are various methods for preparation of Cream Slab method was referred for formulation of Cream.

Slab Technique Method:-

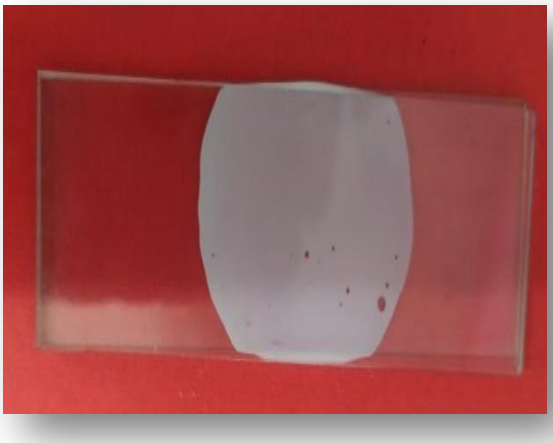
1. The formula for the cream is given upper side Heat liquid paraffin and beeswax in a borosilicate glass beaker at 75 C and maintain that heating temperature. (Oil phase)
2. In another beaker, dissolve borax, methyl paraben in distilled water and heat this beaker to 75 °C to dissolve borax and methyl paraben and to get a clear solution (Aqueous phase). Then slowly add this aqueous phase to heated oily phase.
3. Then add a measured amount of aloe Nutmeg extract and stir vigorously until it forms a smooth cream.
4. Then add few drops of rose oil as a fragrance Put this cream on the slab and add few drops
5. Distilled water if necessary and mix the cream in a geometric manner the slab to give a Smooth texture to the cream and to mix all the ingredients properly.
6. This method is called as Slab technique or extemporaneous method of preparation of cream

FIG[10] :- FORMULATION OF CREAM

EVALUATION TEST :

1) PH: A digital PH metre was used to measure the PH of the produced herbal ointment. Ten millilitres of distilled water were used to produce the ointment solution, which was then left for five minutes.
2) Colour and Odour: Visual inspection was used to assess physical characteristics including colour and smell.
3) Spread ability: By sandwiching an extra sample between two slides that had been crushed to a consistent thickness by applying a specific weight for a specific amount of time, the spread ability was ascertained. Spread ability was calculated as the amount of time needed to separate the two slides. Improved spread ability is the outcome of taking less time to separate two slides. The formala used to calculate spread ability was as follows: S=ML/T Where, S- spread ability. Time taken in seconds.
M- weight of sample in gramT
4) Washability: The skin was treated with the formulation, followed by a gentle water wash and inspection.
5) Non-irritancy: A human subject had the produced formulation applied to their skin, and the results were monitored.
6) Stability : At 37°C for several physicochemical parameters, physical stability study tests of the formulation were conducted on the first day, after three months, and after six months, specifications. For six months, the formulation was determined to be physically stable at several physicochemical parameters.
7) Antimicrobial activity: Using the ditch plate method, the produced gel's antimicrobial properties were investigated. It is a method mostly utilised in semisolid formulation for assessing a compound's bacteriostatic and fungistatic activities. Standard protocol was followed in the preparation and sterilisation of agar plates. A test formulation was used to fill a trench that was created in the middle of the agar plate. From the ditch to the plate's edge, the prepared culture loops were streaked at a straight angle across the agar. The bacterial growth was monitored .

8) Microbial growth: A microbial growth investigation was conducted using nutrient agar medium. Using this technique, gel samples were aseptically transferred in a cross pattern onto blank and sample Petri plates. The proliferation of microorganisms noted .



Figure[11]-spreadability test

Figure[12] -PH test

RESULT:-

Sr.no	Chemical constituent	Test	Interference	Result
1	Alkaloid	Mayer's Test	Apperance of Yellow Cream ppt	Positive
		Wagner's Test	Redish Brown Precipatate	Positive
		Hager's Test	yellowish white ppt	Positive
		Dragandroff s's Test	Red Precipitate	Positive
2	Saponin	Froth test	Creamish bubble form	Negative
3	Phenol		Bluish black colour	Positive

Identification test

EVALUATION TEST:

SR.NO	Parametric test	Formulation first	Formulation 2
1	Color	White	White
2	Homogenicity and texture	Good	Good
3	PH	6.31	6.28
4	Irrtancy	Not checked	Not checked
5	Spredability	Good	Good
6	Phase separation	yes	nill

CONCLUSION:

Our study looked at using extracts from Tridax procumbens and nutmeg to treat Ritter Disease. These extracts have promising qualities, specifically in reducing inflammation and fighting harmful microbes. This suggests that they could be helpful as additional treatments. However, more research is

needed, especially in clinical trials, to confirm these findings. Our results provide a starting point for considering Tridax procumbens and nutmeg as potential additions to the tools we use to treat Ritter Disease. There are synthetic formulations are available in market like vaccine and antibiotics .
We find active chemical constituents in tridex procuremens and nutmeg by using soxhlet extraction method and we find alkaloids ,so we conclude that this drug having property as antibacterial on disease itay be effective on ritter disease on future prospect.

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