FORMULATION AND EVALUATION OF HERBAL ANTI-ACNE CREAM USING MORINGA OEIFERA LEAVES

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ABSTRACT:

Acne vulgaris is a common skin condition affecting millions worldwide, characterized by inflammation, comedones, and often leading to psychosocial distress. Traditional treatments may pose adverse effects, prompting exploration into natural remedies like Moringa oleifera leaves, renowned for their antiinflammatoryandantimicrobialproperties.Inthisstudy,weaimedtoformulate ananti-acnecreamutilizingMoringaoleiferaleafextractandevaluateitsefficacy. The Moringa oleifera leaves were processed to obtain a concentrated extract, rich in bioactive compounds. Formulation development involved optimizing a cream base incorporating the extract, ensuring stability and compatibility. Physicochemical characteristics, including pH, viscosity, spreadability, and texture, were assessed to ascertain formulation suitability. Furthermore, the anti-acne efficacy of the developed cream was evaluated through in vitro assays against acnecausingbacteriaandinflammatorymediators.Additionally,clinicaltrialswere conductedtoassessthecream'ssafetyandefficacyinhumansubjectswithmildto moderate acne. Preliminary findings suggest that the formulated Moringa oleifera leaves anti-acne cream exhibited potent antimicrobial activity against acne-associated bacteria and demonstrated significant anti-inflammatoryeffects. Clinical trials revealed promising results, with subjects experiencing reduced acne lesions and improved skin texture following regular application.

Keywords: Acne, Herbal Cream, Topical Formulation, Moringa Olifera Leaves Extract, Aloevera Gel

INTRODUCTION

Bacterial activity, such as Staphylococcus epidermidis, can lead to acne. The current standard of care for acne is antibiotic therapy, which can cause skin irritationandleadtoresistanceovertime.Theplantmoringaiscommonlyusedas avegetableoranimalfeed.Moringaleavesareknowntohaveanantibacterialeffect due to the presence of secondary metabolites like flavonoids, alkaloids, and phenols. PreviousstudiesonointmentformulationsincludingMoringaleafextractindicated anantibacterialefficacyagainsttheacnecausingPropionibacteriumspecies.

Staphylococcus aureus is significantly suppressed by the Moringa leaf ethanolic extract in cream preparations at concentrations of 5, 10, and 15%. The anti-acne creamformulationusedinthisresearchwascreatedusinganethanolbasedMoringa leaf extract to treat acne.

Moringaoleifera,nativetotheIndiansubcontinentandwidelycultivatedintropical and subtropical regions, has been traditionally utilized in folk medicine for its diversetherapeuticbenefits.Itsleaves,inparticular,haveemergedasarichsource of bioactive compounds, such as flavonoids, phenolic acids, and alkaloids, which exhibit pharmacological activities with potential relevance in dermatological applications.

Acne pathogenesis is multifactorial, involving factors such as excess sebum production, follicular hyperkeratinization, bacterial colonization (notably Propionibacterium acnes), and inflammation. Conventional acne treatments often target these factors individually, and prolonged use may lead to adverse effects, highlighting the need for alternative approacheswith enhanced safety profiles.

Moringa oleifera leaves possess several properties that make them promising candidatesforacnemanagement.Theiranti-inflammatoryactioncanhelpmitigate theinflammatorycascadetriggeredbyacnelesions,therebyreducingerythemaand discomfort. Additionally, their antimicrobial activity may inhibit the growth of acne-causing bacteria, thus preventing further exacerbation of the condition. Moreover, the antioxidant constituents present in Moringa leaves offer protective effects against oxidative stress, which is implicated in acne pathogenesis

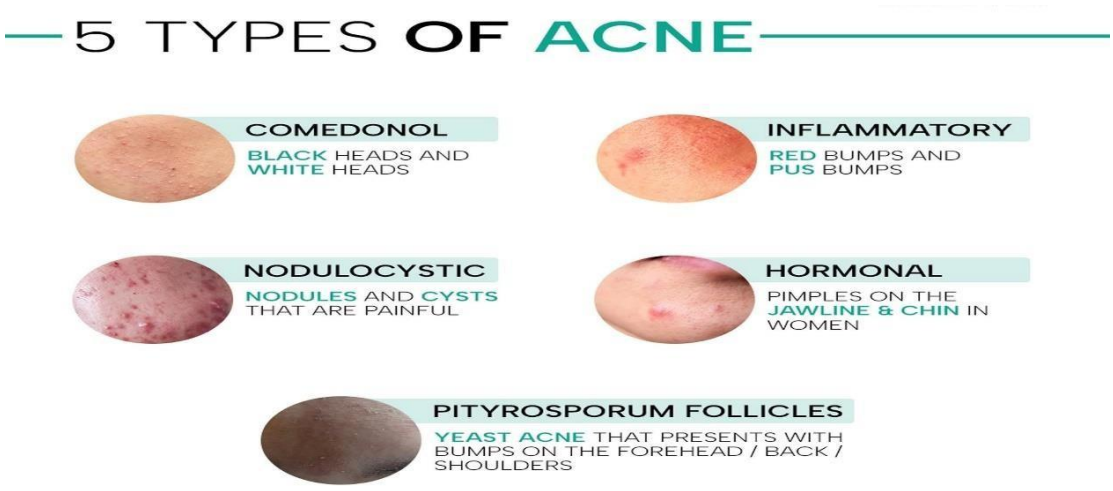

Fig1: Typesofacne

Fig2: Drumsticktree

Herbalcream:

Oilinwater(o/w)orwaterinoil(w/o)typesemisolidemulsionsthataremeantfor external application are commonlyreferred to as creams. It is applied to the outer ormostsuperficiallayeroftheskin,anditsmainbenefitisthatitlastslongeratthe application site. Moringa leaf is the only herbal ingredient we used in our formulation. Acne and pimples can be reduced using moringa.

Idealpropertiesofcream

- It shouldliquefyatbody temperature
- Spread easilyon the skin.
- Pleasantinappearance.
- Itshouldbenon-toxic.
- Itshouldbenon-irritant.
- Itshouldbenon-inflammatory

Advantagesofcream

- Help to reduceinjuryscars
- Helpsindividualstoreduce marks.
- Italsoreducesblemisheshfromtheskin.
- Thecreamreducesundereye dark circles.
- Acne maybe reducedbyuse.
- Melasmacanbereducedbydaily usage

AIMANDOBJECTIVE:

AIM: To Formulation And Evaluation OfHerbal Anti Acne Cream Using Ethanolic Extract Of Moringa Oleifera Leaves With The Assessment Of Its Physiochemical, Biological, And Cosmetic Properties.

OBJECTIVE

- Toformulateaherbalantiacnecream usingMoringaExtract
- Toprovidehydrationand nourishment totheskin
- Toevaluatethe moisturizingandsoothingproperties of thecream
- Todevelop askincareproductwith naturaland safe ingredients
- Toreducethe useofharmful chemical-based cosmetic products
- Tostudythe stabilityandeffectiveness of theformulation
- Toprepareaneco-friendlyand skin-friendlycosmeticproduct
- Topromotethe useof herbal ingredients in skincare formulations

DRUGPROFILE:-

Herbal drugs and their constituents A naturally occurring plant phenol is present in moringa oleifera leaves, Plant polyphenol are well known To show biological activity such as antioxidative activity. In Moringa oleifera leaves contain high concentration of antioxidant property presents.

Moringaoleiferaleaves:-

Inthelastfewdecadesduetoexponentialimprovementintheherbalmedicinefield Moringa oleifera is popular in develop countries because it is obtained from the naturalsourceandshows playanimportantrolein differentmedicinalsystemlike unani, siddha, yoga, homeopathy, naturopathyand ayurveda. More than 70% population uses this non-allopathic system of medicine. Moringa oleiferais also known as horse radish tree and drumstick tree. Fig. 2 show the plant Moringa oleifera Lam.

Fig3: Moringaoliferaleaves

Synonyme: Donaldsoniabaker,Hyperantheraforsk,Drumsticktree,Ben oiltree

Biological source: It contains leaves which are derived from the plant Moringa oleifera L.

Family: Moringaceae

Chemical Constituents: Alkaloids, Flvonoids, Phenol, Carotene, Nicotinic Acid And Ascorbic Acid,

Uses:

1. Itisusedtotreattheasthma.
2. Itisusedtotreatthediabetes
3. Alsoused toincreasebreastmilk production
4. Itisusedinarthritis.
5. Itisusedtotreatcancer.
6. Usedtotreatdiarrhea.
7. Itisusedtotreatacne.
8. Usedinepilepsy.

PreparationofMoringaoleiferaLeavesExtract:

- CollectfreshMoringaoleiferaleavesfromGondiadistrictsource.
- Washtheleavesthoroughlywithdistilledwatertoremoveanydirtorimpurities Dry the leaves in a wellventilated area until they are completely dehydrated.
- Grindthedried leavesinto a finepowder usinga mortarand pestleor a grinder.
- Extractthebioactivecompoundsfromthepowderedleavesusingasuitable solvent,suchasethanolorwaterandtakeintosoxhletapparatusfortheextraction.

FORMULATION TABLE

Sr. no	Ingredient	F1	F2
1.	Moringa extract	1.5ml	1 ml
2.	AloeVeragel	1.5ml	1.5ml
3.	Beeswax	3 g	3 g
4.	Liquidparaffin	10 ml	10ml
5.	Borax	0.2 g	0.2 g
6.	Methylparaben	0.02 g	0.02 g
7.	Distilled water	3 ml	3 ml
8.	oil Rose	0.02 ml	0.02 ml

MethodOf Preparation:

Heat liquid paraffin and beeswax in a borosilicate glass beaker at 75°Cand maintain that heating temperature. (Oil phase).

In another beaker, dissolve borax, methylparaben indistilled water and heat this beaker to 75 °C to dissolve borax and methylparaben and to get a clear solution. (Aqueous phase).

Then slowly add this aqueous phase to heated oily phase.Then add a measured amount of aloe Vera gel, Moringa extract, and stir vigorously until it forms a smoothcream.Thenaddfewdropsoforangeoilasafragrance.Putthiscreamon

the slab and add few drops of distilled water if necessary and mix the cream in a geometric manner on the slab to give a smooth texture to the cream and to mix all theingredientsproperly.Thismethodiscalledasslabtechniqueorextemporaneous method of preparation of cream.

EVALUATIONTESTS

Figno 4:HerbalAcneCream

1. **Physicalevaluation:**Inthistest,thecreamwasobservedforcolour,odour, texture.

2. **Wash ability:**A small amount of cream was applied on the hand and it is thenwashed with tap water.

3. **pH:**0.5gcreamwastakenanddispersedin50mldistilledwaterandthenPHwas measured by using digital PH meter.

4. **Irritancy test:**Makea1cm2markontheleftdorsalsurface.ThenAfterapplyingthe cream, the time was recorded. Then, for a period of up to 24 hours, it is examined for irritancy, erythema, and edema, if any, and repor

5. **Homogeneity**:Byvisualandtouch,theuniformityoftheformulationwas evaluated

6. **Spreadability**:

Thespreadabilitywasexpressedintermsoftimeinsecondstakenbytwoslidesto slipofffromthecream,placedinbetweentheslides,undercertainload.Lesserthe timetakenforseparationofthetwoslidesbetterthespreadability.Twosetsofglass slidesofstandarddimensionweretaken.Thenoneslideofsuitabledimensionwas

taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to formathinlayer.Thentheweightwasremovedandexcessofformulationadhering totheslideswasscrappedoff.Theupperslidewasallowedtoslipofffreelybythe force of weight tied to it. The time taken by the upper slide to slip off was noted. (table 9)Spread ability= m × l/t

Where,
m=Standardweightwhichistiedtoorplacedovertheupperslide (20 g)
l=lengthofaglassslide(5cm) t=
time

7. **Phaseseparation**:Preparedcreamwasstoredinacoveredcontainerawayfrom light at a temperature of 25 to 100 °C. Phase separation was then monitored for 30 days, 24 hours a day. The phase separation was observed to vary in any way.

8. **Greasiness:**Herethecreamwasutilisedontheskinsurfaceintheformofsmear and checked if the smear was oily or grease-like.

9. **Dyetest:**Thecreamiscombinedwiththescarletredcolour.Examinethecream under a microscope after placing a drop of it on a microscope slide and covering itwithacoverslip.Thecreamisoftheo/wkindifthedispersed globules arered andthegroundiscolourless.Incontrast,thedispersedglobulesinw/otypecream seem colourless on the red background.

ResultAndDiscussion

Evaluationresultoftheformulationisgivenbelow.

1. **Physicalevaluation:**

Inthistest,theformulation'sstate,colour,odour,texture,andstatuswereall examined.

Sr. no	Specifications	F1	F2
1.	Color	Greenish	Light greenish
2.	Odour	Pleasant	Pleasant
3.	Texture	Smooth	Smooth

2. **Washability:**

Washabilitytest was carriedout byapplyingasmall amount ofcream on thehand and then washing it with tap water.

Sr.no	Formulation	Washability
1.	F1	EasilyWashable
2.	F2	EasilyWashable

3. **pH Observation:**

Sr.no	Formulation	pH
1.	F1	6.70
2.	F2	6.20

4. **IrritancyTest:**

Sr.no	Formulation	IrritancyEffect
1.	F1	Nill
2.	F2	Nill

5. **Homogenicity:**

Bothformulationwastestedforthehomogeneitybyvisualappearanceandby touch, appearance and touch was good.

6. **Spreadabiliy:**

Sr. no	Formulation	Spreadability
1.	F1	EasilySpreadable
2.	F2	EasilySpreadable

7. **DyeTest:**

Both the cream are separatelycombined with the scarlet red colour. Examine the cream under a microscope after placing a drop of it on a microscope slide and coveringitwithacoverslip.Thegroundwascolourless,andthedispersedglobules were scarlet.

CONCLUSION:

The development of Moringa oleifera leaves anti-acne cream represents a promising advancement in natural skincare, offering a safe, effective, and sustainable alternative for acne management. Further research and development effortsarewarrantedtovalidateitsclinicalutility,addressformulationchallenges, and unlock itsfull therapeutic potential.

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