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Moringa Oleifera and Bougainvillea Glabra: A Contemporary Approach Towards Skin Care

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ABSTRACT
The desire for skin care solutions that can instantly improve one's appearance is rising quickly today. This has pushed certain ingredients to cut corners by adding dangerous substances to skincare products, which has over time led to harmful skin effects. Instead, adding a face serum to your daily skincare regimen can make a big difference. The study's objective is to create and assess a herbal face serum made from extracts of the plants Moringa oleifera and Bougainvillaea glabra. The serum has the capacity to quickly absorb and reach deeper layers of skin. It has a non-greasy, concentrated recipe with a lot of active ingredients. The purpose of this effort was to develop an anti-acne, anti-wrinkle, and anti-aging solution based on this composition. Considering these qualities, the objective was to develop a serum utilizing a *Moringa oleifera* and *Bougainvillea glabra*.*Moringa oleifera* L. (Moringaceae) has been used as traditional medicines in many tropicalandsubtropicalcountries.Squeezing,decoction,maceration,percolationandSoxhletextraction were used to extract fresh and dried leaves of *M. oleifera*. Maceration and Soxhletextraction were used to extract dried bracts of Bougainvillea glabra. Distilled water was usedin squeezing and decoction, while ethanol was used in the other methods. The face serum'sphysiochemicalproperties,pH,phaseseparation,andhomogeneitywereevaluated.Thephaseseparation,homogeneity,andphysicalappearancedidnotalter,according tothestabilityinvestigation'sfindings.

Keywords:Moringaoleifera,Bougainvilleaglabra,antiacne,antiaging,faceserum.

I. INTRODUCTION

Serum are type of skin care product with a moisturizing consistency that has the ability toenter the skin more deeply and release active components. A good skin Serum may provideyour skin a firmer,smoother texture,makepores appear smaller and increase moisturelevels. Whether it is moisturizer, anti-wrinkle or anti-aging product or

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skin serum, all theseproductsshouldcontainantioxidants,cell-communicatingingredientsandskin-identicalingredients.All skin type needs these ingredients to be as healthy as possible. CosmeticSerum is a highly concentrated product based on water or oil.Serums, or concentrates,contain approximately ten times more of biologically active substances than creams, thereforequickerandmoreeffectivelycopingwithcosmeticproblems.Serumsactlocallyupondifferent body parts: face, neck, decollate, eyelids. They can be used irrespective of age.M.oleiferaleafextractwiththehighestcontentsoftotalphenolics,totalflavonoidsamong their major active compounds, and the highest antioxidant activity. The genus Bougainvilleais a very widespread group throughout the world. The anti-bacterialactionofvariousextractsofBougainvilleaglabra'Choicy'leavesmayindicatetheirpotentialasantibacterial remedies. The demand for cosmetic items has increased as a result of the risingexpenseoflivingworldwide.Oneofthemostsignificanteconomicresourcesisthe Malaysian-basedcosmeticsbusiness.Cosmeticshavebecomeincreasinglyvaluableassociety'sdesiretolookandfeelyoungandattractivehasgrown.Askincareproductknownas serum comprises a gel, light moisturizer, or lotion and has the power to deeply enter theskin to deliver active ingredients. A decent skin serum could provide your skin elasticity, asmoothtexture,smaller-lookingpores,andmore hydration.

Activities

- Anti-bacterialproperty

Due toits antibacterial properties, *Moringa oleifera* is helpful in preventing acne breakoutson your skin. It also helps in removing blemishes, dark spots, pimples and blackheads.Moringa will helpin purifyingyourblood andremoving toxinsfrom thebody. As theaccumulationof toxinscanresultinacneandpimples,itkeepsyourskinclear.Furthermore,it helps to reduce the large open pores that you may have on your skin. As it boosts collagenproduction, your skin is tightened and pores are reduced. Ethanolic extract of *Bougainvilleaglabra*iseffectiveagainstseveralbacterialstrains.

- Anti-agingproperty

Therearetwomaingroupsofagentsthatcanbeusedasanti-agingcomponent,theantioxidantandcellregulators.Theantioxidantssuchasvitamins,polyphenolsandflavonoids,reduce collagendegradationby reducingthe concentration of FRintissues.Vitamin C, B3 and E are the most important antioxidants because of their ability to penetratethe skin through their small molecular weight. As it is packed with antioxidants, it preventsfree radical damage. This is extremely important as free radical damage harms your skintissues,whichleadstotheformationofwrinkles.

- Anti-oxidantproperty

The main characteristics of an anti-oxidant is its ability to trap free radicals. Antioxidantcompounds like phenolic acids, polyphenols and flavonoids scavenges free radicals such asperoxidase, hydroperoxide orlipid peroxyl and thus inhibitthe oxidative mechanisms thatleadtodegenerativediseases.Theanti-oxidantproperty*inMoringaoleifera*worksbyinhibiting the acne-causing bacteria which helps in the management of acne and pimples. Theantioxidantproperty in *Bougainvillea glabra* helps in preventing acne, oily skin and otherskindiseases.

- Skinwhitening

When the skin is lacking the water, the skin brightening active ingredient cannot penetratecut in and is absorbed by skin cell. This lead to skin looking dull and the skin moisturizing isvery important part of skin whitening. It helps toachieve skin brightening more easily.Therefore, adding moisturizing ingredients in skin brightening product will improve skinwhitening efficiency. The vitamins and minerals presentin the herbs will naturally lightenandnourishtheskin.

Methods and preparation
Extractionof*moringaoleifera*
Maceration:

Maceration is previously usedin wine-making techniques andhas become extensively usedin plant extraction studies. The plant materials (coarse or powdered) were soaked for at leastthree days at room temperature in solvents such as methanol, acetone, or ethanol, with regularagitation. Filtration was used to filter the mixture after three days. Vongsak et al., (2013) usedthe maceration procedure on Moringa leaves, which involved macerating the dried powderedleaves with 70% ethanol (1:40, w/v) for 72 hours at ambient temperature with intermittentshaking. The extract was filtered, and the marc (extraction residue) was extracted again usingthe same method and solvent

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until the extraction was finished. The maceration techniquerequires longer extraction duration to obtain a high yield of total phenolic content. Besides, ahigh amount of solvent used in the extraction process also requires proper management ofwaste.

Decoctionoffreshleaves(DF):

Thefreshleaveswereminceditosmallpieces,boiledwithdistilledwater(1:10,w/v)at100 ◦ Cfor30minandfilteredthroughaWhatmanNo.1filterpaper.Themarcwasrepeatedlyextracteduntilexhaustion.

Decoctionofdried leaves(DD):

The dried powdered leaves was boiled with distilled water (1:10, w/v) at 100 ◦C for 30 minandthenfiltered.Themarc was re-extracteduntilexhaustion.

SoxhletExtraction:

Soxhletextraction has been a standard technique for extraction for over a century. Theground material is placed in a thimble filled with solvent for extraction purposes in thisprotocol. When the liquid reaches the overflow level, a siphon aspirates it from the thimbleand unloads itback into the distillation flask with the extracted phytochemical.As thisprocessiscontinuous,themethodwillbecontinueduntiltheextractioniscompleteFurthermore,whenthesampleiscontinuallybroughtintotouchwithfreshsection softheextractants, themass transferequilibriumis displaced.Moringa oleifera crudehas beenpreviously extracted using the Soxhlet process which involved placing dried leaves on athimble and extracting with 70% ethanol and solvent ratio of 1:50, w/v. The extraction wasdone five times until it was exhausted. The combined extract from each extraction process idfilteredinthelaststep,and thefilteredaredried at50ºCunderdecreasedpressure.

Microwave-AssistedExtraction(MAE):

Microwave-assistedextraction (MAE)isamodernmethod thathasbecomeinteresttoresearchers for its capability. The MAE uses microwave energy to help analytes from plantmaterial partition into the solvent. MAE improves extraction kinetics and minimizes solventconsumption for more effective extraction. Subsequently, the solutes will separate from theplant matrix and diffuse in the solvent. The transfer of the analytes from the matrix to solventisachievedbythediffusionandconvectionprocess.Themicrowaveovenworksatafrequency of 2.45 Hz with a wavelength of 12.2 cm and extracts phenolic chemicals fromMoringaoleiferaleaves. After the irradiation of the microwave, the mixture of the extractwas cooled before the filtration. The antioxidantand phenolic content of the componentswere quantified after the ethanolic extract was purified and lyophilized to dryness under idealcircumstances. Under the optimum conditions with 35% ethanol solvent, the total phenoliccontentwas16.5mgGAEpergofthedryMoringaoleiferaleaves.

Ultrasound-AssistedExtraction(UAE):

In recent years, ultrasound-assisted extraction (UAE) has been used in extracting bioactivecompounds from plants on a laboratory scale and industrial scale. Ultrasound frequenciesranging from 20 to 2000 kHz are used in UAE. UAE has extracted a variety of bioactivechemicalsusingwaterandethanol-waterassolvents.Themechanicalenergy willformcavities in the liquid. The collapse of biological cell walls occurs when bubbles expand due toenergy absorption, facilitating the release of chemicals and increasing mass transit of solventsinto plant cells. A study by Rodríguez-Pérez reported that the extraction of crude Moringaoleifera extracts using 25 mL of solvents for 15 minutes extraction at room temperatureproducinghigherphenoliccontentusingUAEtechniquecomparedtothemacerationtechnique Similar to MAE, the UAE technique has successfully obtained higher phenoliccontentandflavonoid contentwithshorter extractiondurationandlessamountofsolvent.

Extractionof*bougainvilleaglabra*

*Bougainvillea glabra choisy*and *Bougainvillea California* gold flower along with bracts werecollected and the flowers were removed from stalk and weight was taken then the flowerswere dried under shade at room temperature. Then the flowers were powdered and weights ofpowderedweretakenandthe powderswere storedinsterile containerforfurtheruse.

ExtractionPreparation:

Then dried powder was taken intoSoxhletapparatus for 72 hraccordingtosuccessivesolventextractionusinghydroalcoholic(50:50)solvent.Afterwards,thesolventswereremovedandtheextractsobtainedwere stored

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DryGrindingProcess:
Theflowers were cut approximately in to12 mm in size, cleanedby using distilled water,and dried at room temperature. The dried bracts were crushed into a fine powder using acoffeegrinderand keptina cooldark place untilitusedinthe extractionprocess.

Effectofamountofpowderedplantmaterial:
A Series of (0.033, 0.05, 0.066, 0.1, 0.133, 0.186, 0.2, 0.3, 0.4 gm) of powdered plantmaterial was macerated with 20 ml of ethanol (50%) for 72 h at 20 degreeCelsius. Theextract was filtered after 72 h. The filtrate was kept in a cool dry place to measure theabsorbance every 24 h at the maximum absorbance (λmax) 397 and 548 nm respectively toinvestigate thepigmentstability.

Effectofsolvents:
To investigate the effect of solvent on the extraction of Bougainvillea g. pigment. 0.1 gm ofdry powdered bract was macerated with 20 ml of different types of organic solvent for 72 h.After filtration, the PH of each filtrate was measured as shown in (Table 1) and the filtratewaskeptinacooldryplacetomeasure theabsorbance.

Evaluation

1. Physicalevaluation

- Colorandappearance:Thecolorandappearanceoft heextractwasobservedvisually.

- Homogeneity:The formulation produces uniform distribution of extract. this was confirmed by visuallyappearancebytouch.
- Afterfeel:Emollience, slipperiness and amount of residue left after the application of fixed amount ofserumwasfoundbyapplyingitoverthe skin.

2. Determinationofviscosity

Apparatus:Brookfieldviscometer.

Procedure: The viscosity of the formulation was determined by Brook field viscometer at100rpm, using spindle type model S64. 500ml of the serum was taken in a beaker and thespindlewasdippedinitforabout5minutesand thenthe readingsweretaken.

3. DeterminationofpH:
Apparatus:pHMeter,preferablyequippedwithglasselectrode.

Procedure: The pH was calibrated using standard buffer solution. About 1ml of serum wastakenanddissolvedin100mlofdistilledwaterandPHwasmeasured.

Ph levels		
Alkaline	7-14	Dryness, sensitivity, wrinkles, sun damage
Neutral	5-6	Healthy balanced skin
Acidic	0-6	Acne-prone, oily skin, inflammation

4. Determinationofspreadabilitytime:
Apparatus:Filterpaper,0.5mlsyringewithneedle.Procedure:
a) Begin thetestbyputtinganewsheetofaluminum foil (thatislargerthan thefilterpaper)ontothelabbench. Use alevelledbenchsurface.
b) Chooseafilterpaperandweighthesheetasaccurately aspossible.RecordthisweightasW1.
c) Measureandrecordthetotalareaofthefilter paper.RecordthismeasurementasA1.

d) Carefully place the filter paper in the center of the aluminum foil sheet. Do not bend, foldandalterthefilter paperinany way.Itmustremainabsolutely flatinordertopreventpreferentialspreadinginfoldsorcreases.
e) Holdingthesyringeover thecenterofthefilterpaper carefullypushoutexactly20 drops.

f) When the 20th drop hits the filter paper, stat a timer or stopwatch to count down for exactly10 mints. During the 10 minutes test, the liquid will spread in a relatively uniform circularpatternoverthefilterpaper.
g) When 10 minutes have elapsed, remove the filter paper from the aluminum foil base and,usingscissors,cut the saturated portion of thefilter paper away from the remining drysection.bevery careful tocutexactly on theline between saturated spread and dry filterpaper.
h) Weightheremining dry(unsaturated)filter paper.RecordthisweightasW2.

i) Measure the diameter of the saturated portion of the filter paper. If the spread was not aperfect circle, the take several diameter readings around the spread area and determine anaverage

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diameter.Recordthismeasurementas A2.

4.Globule size determination: Serum has analyzed under microscope to confirm the globulesize a drop of serum was placed on glass slide and diluted with water covered by glass coverandwas observedundermicroscope.

5. Testformicrobialgrowth:

serum inoculated plate media by omitting the product. Plate placed incubator at 37 0C for 24hours.Checkthemicrobialgrowth.

6. Productstorage:

Stabilitytestingrequiresdifferenttemperatureandhumiditycondition.Somestandardtemperature include 400C/75%RH;300C/65%RH;250C/60%RH;50C.

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