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# Phytochemical Screening, Formulation and Evaluation of Moringa Leaf Extract Lotion

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**ABSTRACT**:
*Moringa* have various species like *Moringa longituba, Moringa drouhardii, Moringa ovalifolia* etc. belongs to family Moringaceae. *Moringa Oleifera* is one of the magical plants considered in India due to its high medicinal properties.The present study is focused to investigate the phytochemical analysis of the *Moringa Oleifera* leaves followed by TLC studies to separate and isolate bioactive compound present in extract. Most of the compounds responsible for antioxidant activity, antiinflamatory activity, antiulcer antispasmodic, cholesterol-lowering , anti-HSV , antifungal, diuretic, antihypertensive , hepatoprotective, antitumor activity extracted from polar solvents. polar solvent is selected for extraction and the formulation of moringa leaf extract lotion was prepared and followed by physical evaluation of lotion wih good results.

**KEYWORDS:**
*MoringaOleifera*, Thin layer chromatography (TLC),bioactive compounds, soxhlet extraction, lotion.

## I. INTRODUCTION

Plants and extracts of their various sources have been used for their medical properties and to cure specific ailments. However, since last few decades the interest of researchers has gone up dramatically to understand their detailed compositions and also to explore and establish their potential applications in diverse areas. In fact, it is the need of the hour to leverage the vital power of the nature to combat proliferating diseases like cancer, heart attacks, diabetes, rapid skin aging etc. and upcoming varieties of new alarming health concerns like recent concerns of Coronavirus disease in 2019 (COVID-19)[1].

Moringa have various species like Moringa longituba, Moringa drouhardii, Moringa ovalifolia etc. belongs to family Moringaceae. Moringa Oleifera is one of the magical plants considered in India due to its high medicinal properties. *Moringa oleifera* also commonly known as 'Drumstick' and horse radish tree, benoil tree, miracle tree and mothers best friend. However, there is still a lot of difference in potential of Moringa Oleifera by understanding their phytocomponents and variation in extraction due to solvents, The present study is focused to investigate the phytochemical analysis of the Moringa Oleifera leaves followed by TLC studies to separate and isolate bioactive compound present in extract[2].

Most of the compounds responsible for antioxidant activity, antiinflamatory activity, antiulcer antispasmodic, cholesterol-lowering , anti-HSV , antifungal, diuretic , antihypertensive , hepatoprotective, antitumor activity extracted from polar solvents.polar solvent is selected for extraction and performing the formulation of moringa leaf extract lotion and followed by evaluation of lotion.

## MATERIALS AND METHODS :

### COLLECTION

Leaves of *Moringa oleifera* part was collected from r a g h u v a n a h a l l i Bangalore karnataka. Dried the leaves under shade for four weeks and then finely powdered and stored in container for further use.

### EXTRACTION:

The extraction process was carried out using the soxhlet extraction method. 50 gram each of

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the plant materials (leaves) was weighed into 3 different reflux apparatus. Its packed into the Whattman filterpapper then introduce into the soxhlet apparatus. Dried powder of leaves was continuously refluxed with methanol, petroleum ether and chloroform at 50 degree C for 8-9 hours using Soxhlet apparatus. The solvent extract was collected by evaporating the solvent, which was further pour into a airtight container. Then the phytochemical analysis was individually performed for the test of, alkaloids, flavonoids, steroids, glycosides, terpenoids, tannins and saponins.[3]

**PHYTOCHEMICAL SCREENING OF LEAVES OF *Moringa olifera;***

**ALKALOIDS TEST**- :To the small amount of extract, few drops of dilute HCl were added and then filtered. The filtrate is treated with Dragendroffs reagent; the formation of orange brown precipitate confirms the presence of alkaloids.

**FLAVONOIDS TEST** - : To the aqueous filtrate of plant extract 5 ml of dilute ammonia solution was added and then few drops of concentrated sulphuric acid was added. A yellow color formation indicates the presence of flavonoids.

Lead acetate test – To the aq. Filtrate of plant extract add few drops of lead acetate , a yellow colour formtion indicate the presence of flavonoids.

**GLYCOSIDE TEST**- To 5 ml. of extract add 25 ml of dilute sulphuric acid and boil it for 15 minutes. Cool and neutralize with10% sodium hydroxide, then 5 ml. Fehling solution was added to it. Brick red precipitate indicated the presence of glycosides.

Keller killani test- to the aq. Extract solvent a solution of glacial acetic acid, 2% feric chloride, concentrated sulfuric acid was added, a brown ring formed eith in the layers

**TERPENOIDS**- To 5 ml. of extract, 2 ml. of chloroform was added followed by carefully addition of concentrated sulphuric acid. The formation of reddish brown color layer at the junction confirms the presence of terpenoids.

**TANNINS**- Small amount of extract is diluted, then 4- 5 drops of 10%ferric chloride wasadded .The formation of blue or green color indicates the presence of tannins.

**SAPONINS**- To two ml. of alcohol diluted with water is added to the 2 ml. of the plant extract, shaked well for 15 minutes. Formation of foam indicates the presence of saponins

**STEROIDS**- Extracts were treated with few drops of concentrated sulphuric acid in chloroform, appearance of red colour in chloroform layer indicated the presence of steroid.

Soxhlet extraction

**PHYTOCHEMICAL TEST**

| Sl no. | PLANT CONSTITUENT | PET. ETHER EXTRACTS (non-polar) | METHANOL EXTRACTS (polar) | CHLOROFORM EXTRACTS (medium polar) |
|---|---|---|---|---|
| 1 | ALKALOIDS | Absent | Absent | Present |
| 2 | FLAVONOIDS | Absent | present | Present |
| 3 | GLYCOSIDES | Present | present | Absent |
| 4 | TERPENOIDS | Absent | Present | Present |
| 5 | TANNINS | Absent | present | Present |
| 6 | SAPONINS | Present | Present | Absent |
| 7 | STEROIDS | Present | Absent | present |

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## ISOLATION OF COMPOUNDS BY TLC

**PREPARATION OF SLURRY-** TLC plates made by mixing silica gel and binder calsium sulphate or gypsum in distilled water in beaker shake well for two minutes slurry is prepared.

**PREPARATION OF PLATE-** Plate are washed with soap and water and washed with acetone for removal of fatty materials. The dried in oven . after preparing the slurry , it is poured on to the glass plates which is maintained on a leveled surface. The slurry is spraed uniformly on the surface of the glassplate . after setting, the plates are dried in an oven for 30 minutes or dried in room temperature for whole night

$$\text{RF VALUES} = \frac{\text{Distance travelled by solute}}{\text{Distance travelled by the solvent}}$$

**Phytochemical screening of *Moringa oleifera***

shows the presence of various phytochemicals alkaloids flavonoids, glycosides, terpenoids, tannins, saponinsand steroids in different solvents (methanol, petroleum ether, chloroform). Alkaloids are present in chloroform extract while absent in other extract. Flavonoids are present in extract of methanol and chloroform

extract while absent in other extracts.Glycosides are present in methanol and petroleum ether extracts while absent in other extracts. Terpenoids are absent in petroleum ether extracts while present in other extracts. Tannin shows its presence in extracts of methanol and chloroform while absent in other extracts. Saponins are absent in extract of chloroform while present in other extracts.Steroiods are present in extracts of petroleum ether and chloroform while absent in other extracts.

The saponin present in *Moringa oleifera* has the property to precipitating and coagulating red blood cells. Presence of flavonids is responsible for its antioxidant and anti-inflammatory activity. Glycosides and terpenoids contains antidiarrhoeal property.Tannins contains antihelmitic property. Due to presence of alkaloids leaves of *Moringa oleifera* have antispasmodic and antibacterial properties.

The result obtained in this study, thus suggest that the identified phytochemical compoundsmay be bio-active constituents responsible for the efficacy of the leaves of the *Moringa - oleifera* studied.Hence it could be inferred that the leave extracts could be a source for the industrial manufacture of drugs useful in treatment of certain diseases.

## THIN LAYER CHROMATOGRAPHIC STUDIES-

Each solvent extract was placed to silica gel plates for thin layer chromatography (TLC) analysis. Plate were marked and glass capillaries were used to place the sample. The TLC plates were placed in camber containing Chloroform: Methanol: H2O (7:3:1) solvent (mobile phase) and leave for 20 min to develop bands and was visualized under UV rays. After the solvent running plates are dried and sprayed iodine reagents to detect the bands on the TLC plates. The movement of the separeted compound was expressed by its retention factor (Rf), values were calculated by formula[4].

**Thin layer chromatographic studies *;***

TLC analysis of selected solvent (Methanol, chloroform, Peroleum ether) extract of *Moringa oliefera* leaf was carried out to separate and isolate bioactive compound present in extract. The result of present study indicated in table. Solvent used for Thin layer chromatographic studies of *Moringa oleifera* leaf is Chloroform: Methanol: H2O (7:3:1) for all three extract.

TLC analysis of the methanol extract, reveals the presence of 5 spots with Rf values 0.26, 0.31, 0.51, 0.73, 0.91. Solvent run was 9.2 cm.

TLC of chloroform extract, reveals the presences of five compounds having Rf value are 0.extract8, 0.35, 0.56, 0.77 and 0.96 respectively. Solvent run of chloroform extract was 9.0cm.

TLC of petroleum ether extract reveals the presences of five compound having Rf value 0.25, 0.33, 0.58, 0.72 and 0.97 with different colour spectrum. Solvent run for petroleum ether was 9.0cm.

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**TLC analytical result for methanolic,ethanolic and pet.ether extractFORMULATION OF *Moringa olifera* LEAF EXTRACT IN LOTION:**

| Extract | SolventTaken | SolventRun | Peaks | Peak Colour | Rf Value |
|---|---|---|---|---|---|
| Methanol | Chloform: Methanol: Water(7:3:1) | 9.2 | 2.4<br>2.9<br>4.7<br>6.8<br>8.4 | Brown<br>Brown<br>Green<br>Yellow<br>Blue | 0.26<br>0.31<br>0.51<br>0.73<br>0.91 |
| Chlorof-Orm | Chloform: Methanol: Water(7:3:1) | 9 | 2.6<br>3.2<br>5.1<br>7.0<br>8.7 | Brown<br>Brown<br>Green<br>Yellow<br>Blue | 0.28<br>0.35<br>0.56<br>0.77<br>0.96 |
| Petrolium Ether | Chloform: Methanol: Water(7:3:1) | 9 | 2.3<br>3.0<br>5.3<br>6.5<br>8.8 | Brown<br>Brown<br>Green<br>Yellow<br>Blue | 0.25<br>0.33<br>0.58<br>0.72<br>0.97 |

Based on the content of active ingredients, moringa leaves have various properties such as antioxidants, antimicrobials, natural food preservatives, and anti-inflammatory. moringa leaf extract can be applied in topical form for the prevention and treatment of oxidative and anti-aging stress diseases. A research . showed that a 30% concentration of extract in cream was able to improve skin smoothness. The increasing concentration of extract in cream will increase SPF value. This study will focus on the formulation of extract in the form of lotion preparation with an extract concentration of 30%. The evaluations of dosage form will consist of physical properties.

**Extraction of *Moringa oleifera* Leaf**

The extract of moringa leaf was obtained by maceration method with ethanol 70%. which indicates that the nutritious compounds of phenolic and flavonoids as antioxidants and based on results from TLC studies.

**FORMULATION OF MORINGA LOTION**

| s.no | C0MPOSITION | WEIGHT (g) | Uses |
|---|---|---|---|
| 1 | Moringa extract | 30 | Drug |
| 2 | Stearic acid | 10 | Lubricant |
| 3 | Cetyl alcohol | 10 | Thickener |
| 4 | EDTA | 5 | Chelating agent |
| 5 | Sodium carboxy methyl cellulose | 10 | Emulsifier |
| 6 | Glycerine | 20 | Moisturizer |
| 7 | Propyl paraben | 5 | Preservative |
| 8 | Methyl paraben | 10 | Presservative |
| 9 | Lavender oil | Q.s | Flavaouring agent |

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**PREPARATION:**

The composition of lotion that was used in this study are presented in table.

Preparation of lotion preparations by melting the oil phase and the water phase. The oil phase stearic acid ,cetyl alcohol, the water phase (EDTA, methyl paraben, propyl paraben sodium CMC,distilled water).

30gms of extract is dissolved in 40ml distlled water and heat at 90degree.and filtered then mix sodium CMC with continuous stirring improves viscosity then add 10ml stearic acid and cetyl alcohol . EDTA, propyl paraben and methyl paraben mixture perfume, was added and stirred until homogeneous, added distilled water little by little until a 100 ml lotion was formed.

## Evaluation of Physical Characteristic of lotion:

**Adhesivity test**

The lotion was weighed 0.25 g and then was placed between two glass objects. One kilogram of load was put on the upper side of glass objects to give a tension for 5 minutes. After that, the glass object were put on the tool that had 80 grams of load. The time was needed for two glass objects separated after the load of 80 grams release was noted[5][6]

**Spreadability test**

The lotion was weighed 0.5 g and then was placed in the middle of a circular glass. Theother glass was placed on the upper side of it for 1 minute. The diameter of lotion was measured[7] .

**The measurement of pH**

The pH values of lotion and gel were determined by using pH meter after 500 mg of lotion was soluted in 5 ml of distilled water[8].

**The measurement of visosity** by using The viscosity of lotion or gel was measured Viscosimeter.

**Homogeneity**

The formulations were tested for homogeneity by visual appearance and by touch.

**Appearance**

The appearance of the cream was judged by its color, pearlescence, roughness, and thengraded.

## II. Results

| parameters | Test results |
|---|---|
| viscosity | 2000c.ps |
| pH | 6 |
| Homogeneity | Homogenous |
| Appearance | Thick,Dark yellow colour |
| Spreadability | 4.5 cm |
| Adhesive test | 02.02sec |

## III. Conclusion

The phytochemical analysis of the *Moringa Oleifera* leaves followed by TLC studies was separated and isolate bioactive compound present in extract

*Moringa* leaf extract can be formulated as a lotion and and based on the results of the preparation evaluation test showed that the best formula for lotion preparation

## REFERENCES

[1]. Nitesh B, "Phytochemical analysis of Moringa Oleifera leaves extracts by GC-MS and free radical scavenging potency for industrial applications"Saudi J Biol Sci. 2021 Dec; 28(12): 6915–6928.

[2]. Jaya Gupta Preliminary phytochemical screening of leaves of Moringa oleifera Lam J. Chemtracks, 16 (1), 285-288, 2014

[3]. Meryem Hajji Nabih, Successive Solvent Extraction, Characterization and Antioxidant Activities of Cardoon Waste (Leaves and Stems) Extracts: Comparative Study. Molecules. 2023 Feb; 28(3): 1129

[4]. Ahlam Rashed. Thin Layer Chromatography (TLC) and Phytochemical Analysis of Moringa Oleifera Methanol, Ethanol, Water and Ethyl Acetate Extracts. Saudi Journal of Medical and Pharmaceutical Sciences. 10.36348/SJMPS.2019.v05i10.002.

[5]. Abdul Aziz Setiawan. Formulation and Antioxidant Effectivity Test of Single Bulb Black Garlic Lotion With DPPH Method (1,1-diphenyl-2-picrylhydrazyl). Advances in Health Sciences Research, volume 33.

[6]. Iyan Sopyan. Formulation Of Lotion From Black Tea Extract (Camellia Sinensis Linnaeus) As Sunscreen International

Journal of Applied Pharmaceutics ISSN-0975-7058 Vol 11, Issue 1, 2019.

[7]. N. M. Saptarini. Formulation And Evaluation Of Lotion And Cream Of Nanosized Chitosan-Mangosteen (Garcinia Mangostana L.) Pericarp Extract. Vol. 13 .No. 2,789 – 795,April - June 2020.

[8]. D I Widiputri. Development of Skin Lotion Containing Antioxidant Extract from Coffee Pulp and Study on Its Stability. UNPAR 2019 IOP Conf. Series: Materials Science and Engineering 742 (2020) 012020.