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"Formulation of Antifungal Gel by using Moringa olifera oil"

Mr.Akshay L.Sutar* Ms.Shubhashri V.SutarMs.Pranali B.Shinde Mr.Pruthviraj Sonule Mr.Sushant Sutar Mrs.P.S.Kadane
R.L.Tawde Foundation's, Sarojini College Of Pharmacy, Rajendra nagar, Kolhapur

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ABSTRACT
The goal of this study was to figure out and assess the Moringa seed oil (MSO) nanoemulsion gel utilizing high energy emulsification Stratergy.Strategies Nanoemulsion Strategy gel figured out by high energy emulsification strategy utilizing the correlation of surfactant (tween 80) and cosurfactant (sorbitol) fixation with the variety of Moringa Seed oil concentration. Evaluation of the steadiness of the nanoemulsiongel prep" incorporates centrifugal" fest, viscosity, PH; organoleptic prepn (smell, variety, cleanest & Stage separation) and molecule size estimate during in weeks stockpiling at roomtemperature. Result The outcome showed that all nanoemulsion gel prepn are straightforward yellows Trademark odour type weight 1. 0888-15 * 1193 g/ml and stable 2 weeks stockpiling. room temperature. The littlest molecule Size created by the nanoemulsion gel prep in an equation of the focus.

KEYWORDS–
Moringa seed oil, nanoemulsion gel, Antifungal activity.

I. INTRODUCTION

Moringa Tree: -

The Moringa tree is referred to as the miracle tree because all parts of the tree are utilized for their Considerable pharmacological and nutritional value. Moringa oleifera is the most Widely cultivated species of a monogenetic family, the Moringaceae, that is Native to the Sub-Himalayan tracts of India, Pakistan, Bangladesh and Afghanistan. This rapidly-Growing Tree (also known as the horseradish tree, drumstick tree, benzolive tree, kelor, Marango, mlonge, Moonga, mulangay, saijhan, sajna or Ben oil tree), was utilized by the Ancient Romans, Greeks and Egyptians; it is now widely cultivated and has become Naturalized in many locations in the tropics. It is a Perennial softwood tree with timber of Low quality, but which for centuries has been advocated for Traditional medicinal and Industrial uses. It is already an important crop in India, Ethiopia, the Philippines And the Sudan, and is being grown in West, East and South Africa, tropical Asia, Latin America, The Caribbean, Florida and the Pacific Islands.All parts of the Moringa tree are edible and Have long been Consumed by humans. According to Fuglie the many uses for Moringa Include: alley cropping (biomass Production), animal forage (leaves and treated seed-Cake), biogas (from leaves), domestic cleaning Agent (crushed leaves), Blue dye (wood), fencing (living trees), fertilizer (seed-cake), foliar nutrient (juice Expressed from the leaves), green manure (from leaves), gum (from tree trunks), honey-And sugar cane Juice-clarifier (powdered seeds), honey (flower nectar), medicine (all Plant parts), ornamental plantings. Biopesticide (soil incorporation of leaves to prevent Seedling damping off), pulp (wood), rope (bark), Tannin for tanning hides (bark and Gum), water purification (powdered seeds). Moringa preparations Have been cited in the Scientific literature as having antibiotic, antitrypanosomal, hypotensive, Antispasmodic, Antiulcer, anti-inflammatory, hypocholesterolemia, and hypoglycemic activities, as well As having considerable efficacy in water purification by flocculation, sedimentation.

Moringa Seed: -

The seeds from this plant contain active coagulating agents characterized as dimeric cationic Proteins, having molecular weight of 13 kDalton and an isoelectric point between 10 and 11 The seeds also have Antimicrobial activity and are utilized for waste water treatment. In some Developing countries, the Powdered seeds of M. oleifera are traditionally utilized as a natural Coagulant for water purification Because of their strong coagulating properties for sedimentation of suspended undesired particles.

Moringa Oil: -

Moringa Oil is obtained from the seed kernels of plant Moringa oleifera. It is obtained by cold Expression Or solvent extraction process.

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Moringa seed kernels contain a significant amount of oil That is Commercially known as "Ben oil" or "Behen oil". The seeds contain 19 to 47 % oil , known Commercially As benoil"Theseed oil contains all the fatty acids contained in olive oil, except Linoleic and was used as its Acceptable substitute. It is rich in palmetic, stearic, behmic, and oleic Acids. It is non-drying oil, contains high amount of polyunsaturated triacylglycerols which make it Liquid at ambient temp. The extracted oil Is degummed to reduce cloudiness due to gums and Increase the smoke point, The degummed oil is pale Yellow liquids at ambient temperature with a Characteristic unique odour and palatability. Moringa oil be Utilized successfully as a source of Edible oil for human consumption. It contains high monounsaturated To saturated fatty acids ratio, And might be an acceptable substitute for highly monounsaturated oils Such as olive oil in diets. Moringa oleifera is a tree growing rapidly even in poor soil and is little affected By drought andcan Be easily grown in poor third world countries. The production of useful oil from its Seeds could be of economic benefit to the native population of the areas where the tree is cultivated.

Characteristics of Moringa Oil: -

1. The healing properties of Moringa Oil were documented by ancient cultures.
2. Moringa seed oil (yield 30-40% by weight), also known as Ben oil, is a sweet non-sticking, Non-Drying oil that resists rancidity.
3. Romans used Moringa Oil extensively in perfumery work and Egyptians used it to help Protect Their skin from brutal desert condition.
4. Moringa Oil possesses exceptional oxidative stability and has a shelf life of up to 5 years.
5. This May explain why the Egyptians placed vases of Moringa Oil in their tombs.

Uses of Moringa Oil: -

1. The Ben oil is used extensively in the "effleurages" process.
2. It is used in cosmetics and soaps.
3. Moringa Oil approximately 7-10% behenic acid. Behenic acid is a saturated fat that is Exceptionally moisturizing to the skin and hair.
4. Moringa Oil is also a potent source of oleic acid and is similar in composition. The oil is highly Valued by perfumers for its power of absorbing and retaining Odors, and by watchmakers as A Lubricant.
5. It is used for fine machine lubrication.
6. It is used in the manufacture of perfumes.

II. MATERIAL AND METHODS

Table No.01: Composition of Nanoemulsion Gel

Compositions of Gel	**Formula (%w/w)**		
Karbopol 940	0.5		
TEA	1		
Distilled water ad	100		
Composition ofNanoemulsion	Formula 4(%w/w)	Formula 5(%w/w)	Formula 6(%w/w)
Moringa Seed Oil	5	10	15
Tween 80	36	36	36
Sorbitol	24	24	24
Distilled water	100	100	100

Material

Moringa seed oil (MSO) Tween 80, Sorbitol carbapol TEA and distilled water. All other chemicals were of analytical grade.Apparatus conditions Analytical balance, (Shimadzu, Japan Magnetic Stirrer 3 Thermostat water bath, Auto clave and Laminar air flow and pH meter, Viscometer.

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Procedure:
Preparation of moringa seed Nanoemulsion Gel:
1.moringa seed oil added in the oil phase it act as a mixture of surfactant and co -surfactant.
2.homogeneous stir the mixture with the help of magnetic stirrer.
3.Distilled water is added up to adequate quantity.
4.stirr the mixture until the translucent Nanoemulsion will prepared.
5.Add adequate percentage of ingredients and mix well.

Physiochemical Evaluation of MSO nanoemulsion Gel

1. Organoleptic test

Based on data from the result of observation and stability test For 2 weeks indicated that the nanoemulsion gel has a good Stability for 2 weeks Stability of a prepared pharmulation can Be seen by any change of colour, it's smelt and phase Separation.

2. PH measurement

Determination of pH value from MSO nanoemulsion gel was Using digital pH meter for 10Day fromDay1 Day3, Day5, Day? Day9 Table 7 showed the Results of pH value fromthree formulas for 10Days at room temperature.

3. Viscosity test

Determination of the viscosity of the Nanoemulsion gel was Performed using a Brookfield Viscometer with the Corresponding spindle number at room temperature Data of viscosity test result and graph of Nanoemulsion gel viscosity change can be seen in graph

4. Antifugal Activity

The given synthesized compound show any antifungal activity against tested fungal Pathogens.This test was performed in Shivaji University, Kolhapur By using Different type of Fungus and Bacteria like Aspergillus Niger ,Escherichia Coli and staphylococcus Aureus.

III. RESULT AND DISCUSSION

Organoleptic test Based on data from the result of observation and stability test for 2 weeks indicated that the nanoemulsion gel has a good stability for 2 weeks. Stability of a prepared pharmacy can be seen by any change of color, it's smelt and phase seperation. The characteristics of MSO nanoemulsion gel can be seen in Table2

Days	Organoleptic														
	Colour			Odour			Clarity			Creaming			Phase Separation		
	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3
0	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
1	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
2	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
3	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
4	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
5	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
6	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
7	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-
8	Y	Y	Y	S	S	S	T	T	T	-	-	-	-	-	-

Table No.02: organoleptic Analysis of Nanoemulsion Gel

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Table 2 shows that the nanoemulsion gel stored at room temperature remains clear for up to 2 weeks, the colour and smell are unchanged and no any creaming. The formation of creaming in the preparation was due to the formation of aggregates from the inner phase which has a greater tendency to rise to the surface. According to Sinko9 , creaming is the emulsion separation into two layers, wherein the one layer contains drip grains (the dispersed phase) more than the other layers. If the dispersed phase density is smaller than the continuous phase, the sedimentation velocity becomes negative. In this nanoemulsion gel preparation, there were no any coarse grains from various concentrations of MSO**.**

pH measurement

Determination of pH value from MSO nanoemulsion gel was using digital pH meter for 2 weeks. Table 3 showed the results of pH value from three formulas for 2 weeks at room temperature.

Table No.03: pH Analysis of Nanoemulsion Gel

Formula	**Time (Days)**								
	0	1	2	3	4	5	6	7	8
F1	6.96	6.96	6.93	6.86	6.76	6.66	6.60	6.46	6.46
F2	7.0	6.96	6.93	6.93	6.86	6.76	6.73	6.60	6.53
F3	7.03	7.0	7.0	6.93	6.93	6.90	6.83	6.73	6.56

Viscosity test

Determination of the viscosity of the nanoemulsion gel was performed using a NDG 8-s viscometer with the corresponding spindle number at room temperature for 2 weeks. Data of viscosity test result and graph of nanoemulsiongel viscosity change can be seen

Table No. 04: viscosity Analysis of Nanoemulsion Gel

Sr.No.	Formula	Viscosity (Cp)
1.	F1	47247
2.	F2	47230
3.	F3	47235

Based on the viscosity test results in it was concluded that the higher concentration of moringa seed oil, the viscosity will increase and the longer the storage time, the viscosity will increase. The viscosity of the nanoemulsiongel preparation was carried out at room temperature for 2 weeks in which the room temperature was a low temperature. This suggests that the lower the storage temperature will increase the viscosity of the nanoemulsion gel preparation while storage at room temperature also results in an increase in nanoemulsiongel viscosity. This is consistent with the theory that the storage period will increase the viscosity of the preparation. However, the increase is not so significant.

Antifugal Activity

Table No. 05: Antifungal Activity Analysis of Nanoemulsion Gel

Sr. No	Species Name	Zone of Inhibition		
		25ul	50ul	100ul
1.	AspergillusNiger	25	25	27
2.	Escherichia Coli	15	19	24
3.	StaphylococcusAureus	17	19	21

The given synthesized compound shows antifungal activity against tested fungal Pathogens.

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IV. CONCLUSION:

The result showed Moringa oleifera Seed extract is potential plant containing Antifungal and Antimicrobial properties of it can utilized in various medicinal preparation and the control of various Fungal diseases like athletes' foot, histoplasmosis but the toxicological properties of the plant should Be studied further. The present study has revealed the importance of natural products to control Antibiotic resistant bacteria, which have been a threat to human health. It has the further confirmed That the plant extracts could be used for the treatment of various infections including skin transmitted Infections. The results shows that Moringa oleifera could be exploited for new potent antimicrobial Agents.

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AUTHOR'S CONTRIBUTIONS

All the authors have contributed equally for the outcome of the present work.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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