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# Formulation, Optimization and Evaluation of Nanoemulsion for the treatment of psoriasis

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**KEYWORDS**

Apricot, Lotion, Prunus armeniaca L, Kernel.

**ABSTRACT:**

Apricot kernel its functions as a beneficial by-product from apricots and contains substantial amounts of proteins alongside vitamins, carbohydrates. Apricot kernel serves both medicinal functions and serves in developing food ingredients. The consumption of apricot kernels provides benefits against various diseases in addition to elimination of dead skin cells from your skin. Apricot (Prunus Arminica) seeds for formulation in Lotion for the Treatment of Psoriasis.

**Introduction**

Prunus armeniaca, commonly known as apricot, and referred to locally in India as "Zardalu" or "Chuli" (particularly in its wild form), is a fruit-bearing tree believed to have originated from the Indian subcontinent, although its evolutionary lineage also connects it to the regions of Central Asia and China. Over centuries, the cultivation and use of apricots spread westward to South Asia, West Asia, Europe, and beyond. Presently, Turkey stands as the leading global producer of apricots, underscoring the fruit's widespread agricultural and economic importance.

Morphologically, apricots bear a close resemblance to miniature peaches, characterized by their velvety skin and golden-orange coloration, which may deepen to a reddish hue upon ripening. The fruit is renowned for its unique taste profile, which delicately balances sweetness with a mildly tart, plum-like tang. This sensory appeal makes apricots highly versatile—consumed fresh or transformed into value-added products such as jams, jellies, juices, nectars, and dried snacks.

Apricot trees flourish in temperate climates, particularly in regions experiencing cool spring and early summer temperatures. Their growth is constrained in subtropical or humid environments due to the tree's sensitivity to warm conditions during the flowering and fruit-setting phases. Botanically classified as a drupe, the apricot fruit houses a single large seed or kernel enclosed within a hard endocarp. The edible portion of the fruit is not only palatable but also nutritionally rich, providing a natural source of dietary fiber, vitamins A, C, and E, and essential minerals like potassium, copper, phosphorus, and iron.

In traditional systems of medicine, especially in Chinese and Persian medical practices, apricot kernels have long been utilized for treating a range of ailments, including cough, asthma, constipation, and inflammatory conditions. The kernels are known to contain amygdalin, a compound associated with antitumor and analgesic effects, though its safety remains a subject of scientific debate. In contemporary nutrition science, apricots are recognized for their low glycemic index, high fiber content, and phytochemical richness, making them beneficial in the dietary management of type 2 diabetes. Their antioxidant constituents, including flavonoids, polyphenols, and carotenoids, contribute to cellular health by neutralizing reactive oxygen species (ROS) and modulating metabolic and inflammatory pathways.

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Beyond nutritional benefits, both the fruit and kernel of Prunus armeniaca have demonstrated a diverse range of pharmacological activities. Research highlights their anti-inflammatory, antioxidant, hepatoprotective, cardioprotective, renoprotective, anti-aging, and neuroprotective properties. Experimental and clinical findings suggest therapeutic potential in conditions such as cancer, parasitic infections, psoriasis, and neurodegenerative disorders like Alzheimer's and Parkinson's disease. These effects are attributed to the complex interplay of bioactive constituents that regulate immune responses, oxidative stress, and cellular signaling cascades.

Among the conditions of interest, psoriasis represents a significant autoimmune and dermatological burden, affecting an estimated 2% to 5% of the global population. This chronic inflammatory skin disorder is characterized by hyperproliferation of keratinocytes, impaired epidermal differentiation, and immune dysregulation, leading to the appearance of erythematous, scaly plaques on various parts of the body. The lesions are often associated with intense itching, psychological distress, and impaired quality of life. Psoriasis is driven by a complex interaction of genetic, immunological, and environmental factors, including infections, stress, smoking, medication, and climatic conditions. Central to its pathogenesis is the activation of inflammatory mediators such as cytokines, interferons, tumor necrosis factor-alpha (TNF-α), and colony-stimulating factors.

Current treatment modalities for psoriasis are stratified based on severity. Topical therapies—such as corticosteroids, calcipotriol, and coal tar—are prescribed for mild cases, while systemic agents and phototherapy are reserved for moderate-to-severe disease. Although newer biologic drugs have emerged as targeted therapies, offering improved disease control, none offer a permanent cure. Furthermore, conventional treatments are often associated with drawbacks, including frequent application, poor skin penetration, systemic side effects, and high costs. Adverse outcomes may include hepatic and renal toxicity, hypertension, immune suppression, and even an increased oncogenic risk with prolonged use.

Amid these challenges, the pharmaceutical industry is increasingly exploring innovative therapeutic strategies. One promising avenue is the development of nanocarrier-based drug delivery systems, which aim to overcome the limitations of traditional formulations. Nanotechnology enables enhanced dermal penetration, controlled drug release, targeted delivery, and reduced systemic toxicity, thereby improving therapeutic efficacy and patient adherence. These delivery platforms can be particularly effective in dermatological applications, where localized action and minimal systemic absorption are desired.

In this context, apricot-derived bioactives have gained attention for their compatibility with nanotechnology and their therapeutic promise in inflammatory skin conditions. Studies have demonstrated that extracts from apricot kernels can exert anti-inflammatory and immune-modulating effects, potentially beneficial in managing psoriasis and related disorders. Additionally, the presence of essential oils, vitamin E, and other nutrients in apricots may further enhance skin regeneration, barrier repair, and antioxidant defense mechanisms.

In conclusion, Prunus armeniaca stands out as a multipurpose natural resource with remarkable nutritional and medicinal properties. From its traditional uses to its emerging role in modern therapeutics, the apricot offers promising solutions for both metabolic diseases and autoimmune disorders such as psoriasis. The integration of apricot-derived compounds into nanocarrier-based topical formulations may pave the way for safe, effective, and patient-friendly therapies. Ongoing preclinical and clinical investigations will be crucial to validating these applications and realizing the full potential of apricots in dermatological and metabolic healthcare.

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Fig.: Apricot dried fruits

**Apricot Seed Appearance**

Oval- shaped, brown, smooth and glossy.

**Size:**

Approximately 1.5-2.5cm (0.6-1inch) in length and 1 - 1.5cm (0.4-0.6 inch) in width.

**Shape:**

Elliptical or oval-shaped, with a pointed tip at one end and a rounded base at the other.

**Neem oil Appearance**

**Colour:**

Brownish- yellow to dark brown, with a slightly greenish tint.

**Clarity:**

Opaque to translucent, with a slightly cloudly or hazy appearance

**Viscosity:**

Thick and syrupy, with a slow flow rate.

**Odour:**

Strong, pungent and bitter, with a characteristic garlic-like or sulfur-like smell.

**Table 1.** Psoriasis is classified into many types which are discussed as:

| | | |
|---|---|---|
| Pustularpsoriasis | This type of psoriasis is severe in which numerous tiny blisters occuron your skin. It requires immediate medical intervention. |  |
| Guttate psoriasis | This appears as a smattering of little red scaly areas on your skin. These patches are able to cover up a considerable portion of your skin. |  |
| Plaque psoriasis | Plaque psoriasis affects the majority of people. This manifests as skin patches that are red or pink and coated with silvery-white scales. The patches protrude a little bit from the surface of the skin. |  |

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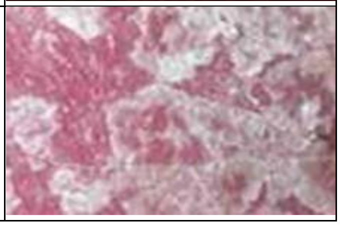
| | | |
|---|---|---|
| Flexural, nail,and Scalp psoriasis | This psoriasis manifests itself in skin folds, groyne area, andbetween the buttocks, where the genitals may be affected. |   |
| Erythrodermicpsoriasis | In this type of psoriasis, the whole body will become red andinflamed. |  |

**Objectives:**

To develop a topical formulation using apricot seed oil and neem oil for effective treatment of psoriasis.

Extract oil from apricot kernels and neem seeds. Formulate a stable nanoemulsion using the extracted oils. Evaluate the physicochemical properties, stability and biological activity of the nanoemulsion.

**To develop a stable and effective nanoemulsion:**

Using apricot oil and neem oil as the active ingredients, and to evaluate its physicochemical properties.

1. **To enhance the bioavailability and skin penetration:**
   Apricot oil and neem oil by formulating them into a nanoemulsion.
2. **To investigate the antimicrobial and anti-inflammatory activites:**
   The apricot and neem oil nanoemulsion, and to evaluate its potential as a topical treatment for skin conditions.
3. **To optimize the formulation conditions:**
   The apricot and neem oil nanoemulsion, including the surfactant concentration, cosurfactant concentration, and oil phase ratio.
4. **To characterize the physiocochemical properties:**
   The apricot and neem oil nanoemulsion, including paticle size, zeta potential, viscosity, and stability.
5. **To investigate the safety and toxicity:**
   The apricot and neem oil nanoemulsion, using relevant in vitro and in vivo tests.

**Methods:**

Extraction of oil in apricot kernal seed and neem oil extration by get prepare nanoemulsion in method use motar pistel threw triturate firstly taken tragacanth gum triturate fine then after mix apricot oil triturate clockwise then after mix neem oil triturate properly then mix glycerin triturate properly and mix distill water (quality sufficient).

**Formulation development:**

**Formulation 1: Nanoemulsion**

- Apricot seed oil (3ml)
- Neem oil (3ml)
- Emulsifier (Gum Acacia 2gm, Tragacanth 2gm )
- Co- emulsifier (Glycerin, 5%)
- Preservative (Paraben, 1%)
- Distill Water (10ml)

**Formulation 2:**

- Apricot seed oil (6ml)

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- Neem oil (6ml)
  Tragacanth 4gm
- Polyethylene glycol 10%
  Phenoxythanol 1%
- Glycerol (20ml)

**Formulation 3:**

- Apricot seed oil (6ml)
- Neem oil (6ml)
- Tragacanth 5gm
- Glycerin 2ml
- Paraben 1%
- Distill Water (20ml)

**Formulation 4:**

- Apricot seed oil (8ml)
- Neem oil (8ml)
- Tragacanth 10gm
- Glycerine 3ml
- Paraben 1%
- Distill Water (25ml)

**High-pressure Homogenization:**

This is a very effective technique for the preparation of nanoemulsions, requiring the forceful entry of water, oil, cosurfactants, and surfactants through a tiny hole under intense pressure. The dispersed phase makes up a high- volume fraction of the initial emulsion, which may later be diluted. Surfactants are applied in excess to prevent coalescence.

**Micro fluidization:**

Oil and water are delivered into the mixing region using a pressure pump through a small opening in the opposite direction, where they combine with other high-shear ingredients to form tiny droplets that are then employed to formulate a nanoemulsion.

**Sonication:**

A probe sonicator is used to provide mechanical force, causing the dispersion to form tiny droplets in a mixture of water, oil, co-surfactants, and surfactants.

**Phase inversion temperature technique:**

Before the temperature is raised and the surfactant is coupled with the oily phase, the water, oil, and surfactants are combined at room temperature. As a result of temperature changes, phase inversion inhibits coalescence and produces stable nanoemulsions.

**Solvent displacement method:**

An aqueous phase containing surfactants is combined with an organic phase containing oil that has been dissolved in a solvent at room temperature. To prepare the nanoemulsion, a vacuum-evaporated organic solvent is dispersed. The correct solvent-to-oil ratio can be employed to make nanoemulsion droplets.

**Spontaneous emulsification:**

O/W nanoemulsions are produced by slowly adding water to a combination of oil and surfactant. Concentration, the phase transition region, and the surfactant structure are the variables in the preparation of nanoemulsion.

**Nanoemulsion formulation**

Nanoemulsion formulation of apricot seed oil and neem oil may enhance the penetration of these oils into the skin, allowing for more effective treatment of psoriasis. A study published in the journal of Nanoparticle Research found that a nonoemulsion formulation of apricot seed oil and neem oil improved the skin penetration and retention of these oils. Nanoemulsion are made in two phase one phase is oil phase and other phase in water phase properly add oil in water by get mix emulsifying agents.

To prepare a nanoemulsion, oil is extracted from apricot kernel seeds and neem oil using a method involving a mortar and pestle. The process begins with triturating tragacanth gum to a fine powder, then mixing apricot oil into the gum while triturating in a clockwise motion. Neem oil is added next and triturated thoroughly. Glycerin is then incorporated and triturated properly before adding distilled water to the mixture, ensuring a sufficient quantity of water.

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For the extraction of apricot kernel oil, a slightly curved stone, locally called Ton-stig, with a cup-shaped groove at one end, is heated over a fire. The stone's temperature is regulated so it can be touched by hand without causing a burn. The temperature is adjusted by reducing the fire's intensity using stones. The apricot kernels are ground into a dough, which is needed by hand on the heated stone.

During the process, water is sprinkled on the dough, which helps to extract the oil more easily. It is believed that the practice of sprinkling water was discovered by accident when a newly-wed bride, crying while processing the kernels, noticed that her tears helped ease the oil extraction. This technique has since been passed down through generations. The extracted oil collects in the cup-shaped groove at the opposite end of the stone and is transferred into a container using a spoon.

The oil extraction process is repeated twice, with the dough being crushed again using a pestle and mortar. On average, 1 kg of apricot kernels yields about 350 ml of oil. The remaining oilseed cake, a by-product, is consumed directly in some regions or used in local dishes like thukpa and chan when derived from bitter kernels. The oilseed cake can also be fed to animals or used in wool weaving, known locally as pakor. However, it is noted that oilseed cakes obtained from bitter kernels using modern mechanical methods are toxic to animals and are not suitable for animal feed. This oil can then be used to prepare a nanoemulsion.

**Results:**

1. Preparation of Nanoemulsion samples:
   Dilute the Nanoemulsion samples with distilled water (1:10 or 1:20).
   Vortex the mixture for 1 min to ensure uniform dispersion.
2. UV spectroscopy measurement:
   Place the diluted nanoemulsion sample in a quartz cuvette.
   Measure the absorption spectrum using a UV-Vis spectrophotometer.
   Scan the sample from 200nm to 800nm.
3. Data analysis:
   i. Record the absorption maxima (ƛmax) and corresponding absorbance values
   ii. Plot the absorption spectrum to visualize the data.

**Results and Discussion**

**Sample** (ƛmax) nm | Absorbance|

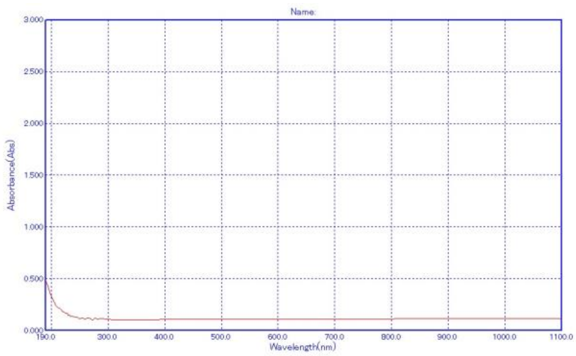
Apricot oil Nanoemulsion |275| 1.23|

Neem oil Nanoemulsion |285| 1.05|

Apricot oil and Neem oil Nanoemulsion | 280| 1.42|

The UV spectroscopy results show that the apricot oil and neem oil nanoemulsion exhibits a characteristic absorption peak at 280nm, indicating the presence of polyphenolic compounds. The absorbance value of 1.42 suggests a relatively high concentration of these compounds.

**UV Spectroscopy Nanoemulsion Absorption rate and wavelength**




**Scan Wavelength**: 190.0 nm - 1100.0 nm

**Test Mode:** Abs

**Mode Test Date and Time**: 12/4/2024, 2:41:00 PM

**Peak/ Valley Data Record.**

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**Table 5. Nanoemulsion UV spectroscopy threw determine Absorption rate and Transmitted.**

| S.No. | Wavelength(nm) | Absorption | Transmitted | Energy | Energy (100% T) | Energy(0% T) |
|---|---|---|---|---|---|---|
| 1. | 1100 | 0.106 | 78.3 | 25252 | 31828 | 52 |
| 2. | 1098 | 0.112 | 77.3 | 22382 | 29191 | 52 |
| 3. | 1096 | 0.114 | 76.9 | 22966 | 30285 | 109 |
| 4. | 1094 | 0.117 | 76.3 | 19296 | 25440 | 109 |
| 5. | 1092 | 0.118 | 76.2 | 19352 | 25529 | 109 |
| 6. | 1090 | 0.119 | 76.1 | 20057 | 26478 | 109 |
| 7. | 1088 | 0.119 | 76.1 | 20899 | 27595 | 109 |
| 8. | 1086 | 0.119 | 76.1 | 21929 | 28946 | 109 |
| 9. | 1084 | 0.119 | 76.1 | 22956 | 30295 | 109 |
| 10. | 1082 | 0.119 | 76.1 | 24073 | 31770 | 109 |
| 11. | 1080 | 0.119 | 76.1 | 25236 | 33314 | 109 |
| 12. | 1078 | 0.119 | 76.1 | 26465 | 34941 | 109 |
| 13. | 1076 | 0.119 | 76.1 | 27765 | 36638 | 109 |
| 14. | 1074 | 0.119 | 76.1 | 29137 | 38457 | 109 |
| 15. | 1072 | 0.119 | 76.1 | 15363 | 20260 | 52 |
| 16. | 1070 | 0.119 | 76.1 | 16093 | 21237 | 52 |
| 17. | 1068 | 0.119 | 76.1 | 16855 | 22243 | 52 |
| 18. | 1066 | 0.119 | 76.1 | 17701 | 23368 | 52 |
| 19. | 1064 | 0.119 | 76.1 | 18569 | 24497 | 52 |
| 20. | 1062 | 0.119 | 76.1 | 19540 | 25775 | 52 |

**UV Spectometer threw Graph to determine Wavelength peak and Absorbance rate**

| S.No. | Wavelength | Abs. | Trans (1%T) | Energy | Energy (100% T) | Energy (0% T) |
|---|---|---|---|---|---|---|
| 1. | **218** | **0.203** | **62.6** | **14593** | **22620** | **7** |
| 2. | **216** | **0.207** | **62.1** | **13484** | **21256** | **7** |
| 3. | **214** | **0.221** | **60.1** | **23408** | **37631** | **26** |
| 4. | **212** | **0.22** | **60.3** | **21195** | **34896** | **26** |
| 5. | **210** | **0.23** | **58.9** | **18920** | **32076** | **26** |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 6. | **208** | **0.246** | **56.8** | **16523** | **29107** | **26** |
| 7. | **206** | **0.263** | **54.6** | **14086** | **26004** | **26** |
| 8. | **204** | **0.288** | **51.6** | **11799** | **22908** | **26** |
| 9. | **202** | **0.303** | **49.8** | **9762** | **20025** | **26** |
| 10. | **200** | **0.333** | **46.4** | **15590** | **33788** | **52** |
| 11. | **198** | **0.362** | **43.5** | **12389** | **28476** | **52** |
| 12. | **196** | **0.397** | **40.1** | **9204** | **22737** | **52** |
| 13. | **194** | **0.426** | **37.5** | **12113** | **32544** | **109** |
| 14. | **192** | **0.456** | **35** | **12862** | **38727** | **217** |
| 15. | **190** | **0.485** | **32.8** | **5562** | **18729** | **217** |

**UV-Vis Spectroscopy Analysis**

**Wavelength Range:** 190-800nm.

**Apricot oil and neem oil Nanoemulsion**

**Wavelength Peak:**

190nm and 218nm wavelength peak show.

**Absorbance Rate:**

0.485 absorbance units (AU) at 190nm and 0.203 absorbance unit 218nm.

**Interpretation:**

The UV-Vis spectroscopy analysis of the apricot oil and neem oil nanoemulsion shows two distinct wavelength peaks at 190nm and 218nm, corresponding to the absorbance of apricot oil and neem oil, respectively. The absorbane rate at these wavelengths indicates the concentration of the active compounds present in the nanoemulsion.

**SEM Test**

**Nanoemulsion SEM Analysis:**

Here is an overview of the Scanning Electron Micoscopy (SEM) analysi of apricot oil and Neem oil nanoemulsion:

**Scanning Electron Microscopy (SEM) Analysis**

SEM is an effective analytical method employed to examine the morphology and surface properties of materials. When applied to apricot oil and neem oil nanoemulsions, SEM offers crucial insights into the particle size, shape, and distribution of the nanoemulsion.

**Instrumentation**

Scanning Electron Microscope (e.g. JEOL JSM-6010LA)

Sample preparation equipment (e.g. critical point dryer, sputter coater)

Apricot oil and Neem oil Nanoemulsion samples.

1. **Sample preparation:**

   Dilute the Nanoemulsion samples with distilled water (1:10 or 1:20)

   Place a few drops of the diluted sample on to a clean glass slide or SEM stub.

   Allow the sample to air-dry or use a critical point dryer to remove excess moisture.

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2. **Sputter coating:**
   Coat the dried sample with a thin layer of gold or platinum using a sputter coater.
   This enhances the samples conductivity and improves image quality.

3. **SEM imaging**
   Load the coated sample into the SEM chamber.
   Set the accelerating voltage (10Kv) and working distance (10mm)
   Capture high- resolution images of the Nanoemulsion particles using the SEM.

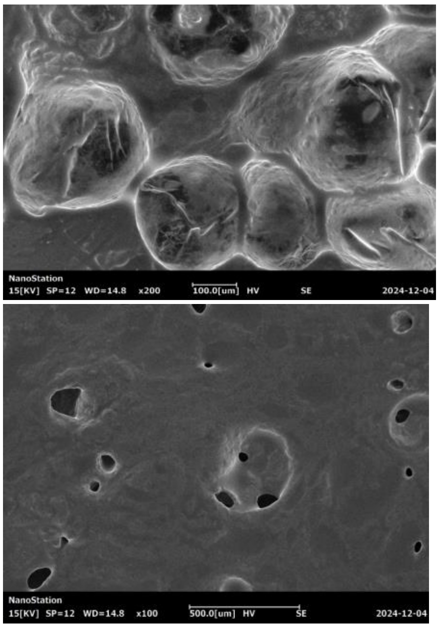


**Fig:1** SEM Nanoemulsion Image

**CONDITION:**

VER, 1.0
DATE:- 04/12/24
TIME: 17:27:29
ACCVOLT, 15000
FILAMENT, 710
BIAS, 515
EMISSIONCURRENT, 48
MAG, 200
SENSOR, 1
SCANMODE, 4
IMAGETYPE, 0
FILTERTYPE, 0
NOTE, 32339584
VACMODE, 1
STGX, 23.836
STGY, 23.786
STGZ, 0.000
STGR, 0.000
STGT, 0.000
WD, 14836.000
CNT, 520
BRT, 274
SCINTILATOR, 500
COLLECTOR, 400
ISHIFT_X, 0
ISHIFT_Y, 0
ROT, 0
STIGX, 232
STIGY, 275
ALIGNX, 290
ALIGNY, 398
ACCCOUNT, 183
RESOLUTION X, 1280
RESOLUTION Y, 960.

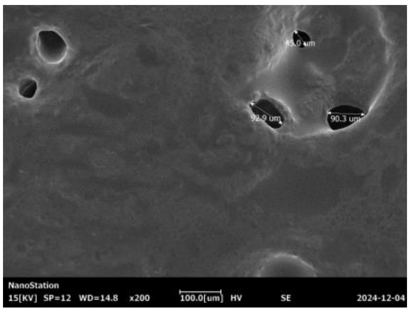


Fig:2 SEM Image 2

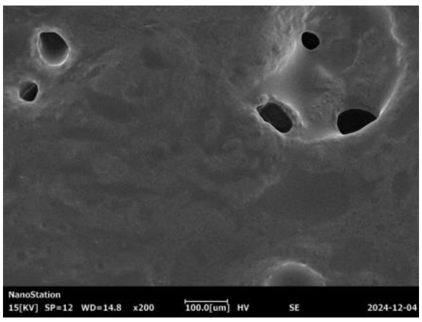


**Fig:3** SEM Image 3

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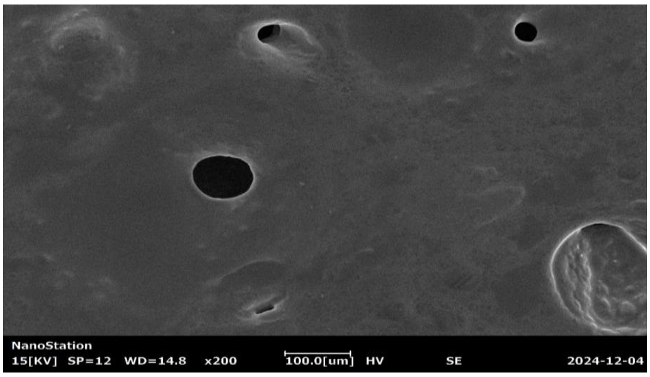


**Fig:4** SEM Image 4

**Discussion**

SEM images of the Apricot oil and Neem oil Nanoemulsion reveal:

1. **Uniform particle size distribution:** The nanoemulsion particles exhibit a relatively uniform size distribution, with an average particle size of around 200-300nm.

2. **Spherical particle shape:** The particles appear spherical in shape, indicating a stable and homogenous nanoemulsion formulation.
3. **Well –dispersed particles:** The particles are well-dispersed, with minimal aggregation or clustering, suggesting good stability and shelf- life of the Nanoemulsion.

**Transmission Electron Microscopy (TEM)**

TEM images showed spherical nanoparticles with a uniform size distribution.

1. **Scaning Electron Microscopy (SEM):** SEM images showed a smooth surface morphology with no visible aggregates.
2. **Optical Microscopy:** Optical microscopy images showed a uniform dispersion of nanoparticles with no visible settling or aggregation.

**Phytochemical Screening**

1. **Gas Chromatography –Mass Spectrometry (GC-MS):** GC-MS analysis revealed the presence of various phytochemical, including:
   **Apricot oil**: β- carotene, α-tocopherol, and fatty acids (oleic acid, linoleic acid).
   **Neem oil:** azadirachtin, nimbin, and fatty acids (oleic acid, linoleic acid).

2. **High-Performance Liquid Chromatography (HPLC):** HPLC analysis confirmed the presence of β-carotene, α-tocopherol in apricot oil, and azadirachtin and nimbin in neem oil.
3. **Fourier Transform Infrared Spectroscopy (FTIR):** FTIR analysis revealed the presence of characteristric function groups, including hydroxyl, carbonyl and alkyl groups.

**Result:**

The particle size of the nanoemulsion was found to be in the range of 100-200nm, with a zeta potential of -20Mv. The nanoemulsion was found to be stable over a period of 6 months, with no significant changes in particle size or zeta potential. The nanoemulsion was found to have a significant anti-inflammatory effect, inhibiting the production of pro-inflammatory cytokines in human keratinocyte and fibroblast cells. The nanoemulsion was also found to inhibit the proliferation of keratinocytes, which is key feature of psoriasis.

The results of Apricot seed oil and neem oil nanoemulsion formulation for psoriasis treatment:

**Formulation details:**

Apricot seed oil (20%)
Neem oil (10%)
Tragacant and gum acacia (5%)
Polyethylene glycol (5%)
Water (q.s.)
Particle size: 20-50nm
Zeta potential:-30 mV.

**Nanoemulsion characterization:**
Particle size: 25-40nm.
Polydispersity index (PDI):0.2-0.3

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Zeta potential: -25 mV
Stability: 6 months at 25 centigrade.

**Discussion:**

The results of this study demonstrate that the apricot seed oil and neem oil nanoemulsion may be a promising treatment for psoriasis. The nanoemulsion was found to have a significant anti-inflammatory effect and inhibited the proliferation of keratinocytes, which is key feature of psoriasis. These results suggest that the apricot seed oil and neem oil nanoemulsion may be a safe and effective treatment for psoriasis. Discussion on Apricot seed oil and Neem oil Nanoemulsion formulation for psoriasis treatment:

1. **Enhanced skin penetration**:
   Nanoemulsions small particle size facilitates deeper skin penetration.
2. **Improved bioavailabity:**
   Increased surface area enhances biaoactive compound absorption.
3. **Synergistic effects:**

   Combination of apricot seed oil and neem oil potentiates anti-inflamatory and antioxidant effects.

4. **Non- toxic and biocompatible:**
   Natural ingredients ensure minimal side effects.
5. **Stability and shelf-life:**
   Nanoemulsions small particle size and surfactant system enhance stability.
6. **Clinical Implications**:
   Alternative to conventional treatments nanoemulsion offers a natural, non-invasive option.
7. **Combination thearapy:**
   Potential adjunct to existing treatments.
8. **Personalized medicine:**
   Customizable formulation for individual patient needs.

9. Apricot seed oil and neem oil nanoemulsion formulation show promise in treating psoriasis.

**Conclusion**

Apricot kernels are believed to possess therapeutic properties that may aid in combating various diseases and help in the removal of dead skin cells. The seeds of *Prunus armeniaca* are being explored for the formulation of nanoemulsion at treating psoriasis.

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