



Herbal Medicinal Plants For the Treatment Of Eczema

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Abstract:-

Atopic eczema (AE) is a chronic, inflammatory skin disorder which usually develops in early childhood. In spite of intensive investigations, the causes of AE remain unclear, but are likely to be multifactorial in nature. Environmental factors or genetic-environmental interactions seem to play a key role in disease progression. The effectiveness, safety, and underlying mechanisms of several herbal treatments used to treat eczema are examined in this review. Many herbs with anti-inflammatory, moisturizing, and immune-modulating qualities have been researched, including calendula, licorice, aloe vera, chamomile, and turmeric. These herbs have demonstrated encouraging effects in lowering the itching, irritation, and dryness of the skin associated with eczema. While chamomile and aloe vera are well known for their calming and anti-inflammatory properties, curcumin, the main ingredient in turmeric, has strong antioxidant and anti-inflammatory properties. Calendula and licorice root have also been shown to improve skin healing and lessen irritation.

Keywords :-

Anti-Inflammatory, Antibacterial, Antioxidant, Antimicrobial, Atopic Dermatitis , Eczema

1.Introduction

An inflammatory skin condition known as atopic dermatitis (AD) is caused by a complex interaction of immunological, environmental, and hereditary factors. The great clinical variation in AD is also a result of multifactorial etiopathogenesis. AD has been largely viewed as a childhood disease for a number of years; prevalence in children varies between 2.7% and 20.1% across different countries, and prevalence in adults ranges from 2.1% to

4.9% [1]. The disease also exhibits a variety of phenotypes, ranging from persistent forms in childhood to late onset forms in adulthood or in the elderly [2]. Young children are the main victims of atopic dermatitis (AD), a common inflammatory skin disease that is chronic, relapsing, and persistent. Various medicinal plant species from around the world are used in traditional medicine to treat a range of conditions. The active ingredients in most conventional medical therapies are plants. [3] Treatment options for eczema included immunomodulating medications, topical and systemic corticosteroids, emollients, and antibiotics. Corticosteroids, the most widely used choice, have potent effects, including halting the synthesis of adhesion molecules and cytokines [4]. Since there is presently no proven cure for the condition, people are increasingly using herbal therapies such homeopathic medications, special diets, and herbal remedies since they are more effective at enhancing their health and quality of life and have less adverse effects [5].

2) Objectives:

1. Manage Symptoms
2. Enhance the Function of the Skin Barrier
3. Avoid Flare-Ups
4. Encourage Long-Term Administration
5. Determine the triggers

3) Pathophysiology:

1] One common type of inflammatory skin disease is AD, which involves a complex inflammatory response of the skin, especially in the dermal and epidermal layers. In contrast to dermatitis, which is defined as skin inflammation, "atopic" refers to skin allergies caused by a hereditary propensity to develop allergic reactions in response to sensitizing environmental allergens such pollen, house dust mites, and food allergens [6].

2] Dry, irritated skin, severe pruritis, itching, and skin hypersensitivity are some of the typical signs of AD. Recurrent rashes, chronic scratching, erythematous plaques, and tiny bumps that resemble blisters and may leak extracellular fluid are some symptoms of AD. When AD is severe and chronic, it disrupts sleep, which can result in insomnia, emotional and psychological anguish, and a poor quality of life. The areas of the body most prone to developing AD-like skin lesions are the front of the neck or face, the back of the knees, and the elbow creases of patients [7,8].

4) .Eczema:-

Atopic dermatitis, another name for eczema, is a chronic inflammatory skin disorder that results in a rash and dry, itchy skin.

5) .Types of Eczema :-

1] Atopic dermatitis: The most frequent form, often starting in childhood. It is linked to allergens like hay fever or asthma as well as a genetic predisposition.

2]. Contact dermatitis:- caused by an allergy or irritant coming into contact with the skin. It is further separated into allergic contact dermatitis (caused by allergens) and irritant contact dermatitis (caused by harsh chemicals).

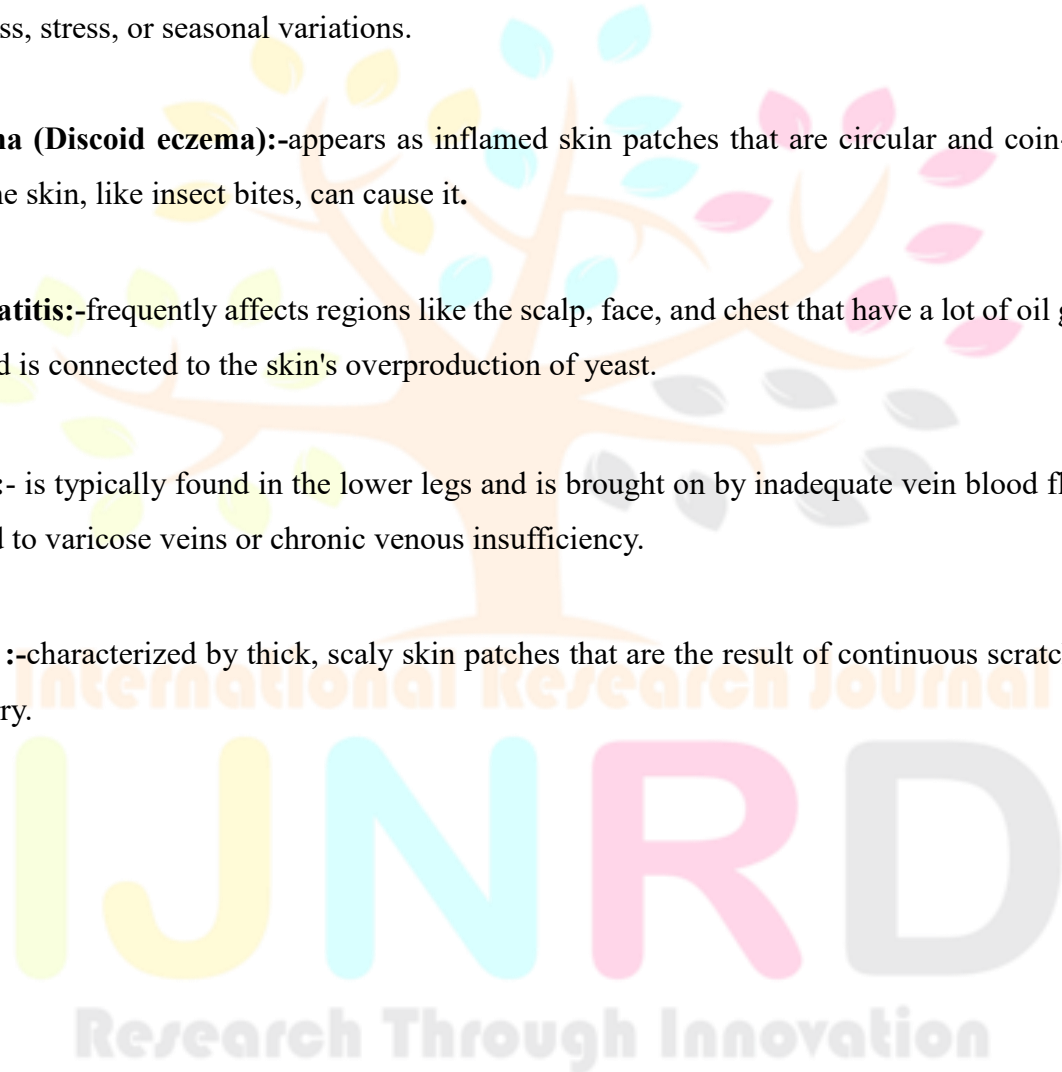
3]. Dyshidrotic Eczema :-characterized by tiny, irritating blisters on the palms, soles, toes, and fingers. frequently brought on by wetness, stress, or seasonal variations.

4)Nummular eczema (Discoïd eczema):-appears as inflamed skin patches that are circular and coin-shaped. Dry skin or wounds on the skin, like insect bites, can cause it.

5)Seborrheic Dermatitis:-frequently affects regions like the scalp, face, and chest that have a lot of oil glands. It can result in dandruff and is connected to the skin's overproduction of yeast.

6)Stasis Dermatitis:- is typically found in the lower legs and is brought on by inadequate vein blood flow, which is frequently connected to varicose veins or chronic venous insufficiency.

7] Neurodermatitis :-characterized by thick, scaly skin patches that are the result of continuous scratching brought on by tension or worry.



6) .Mechanism of action :-

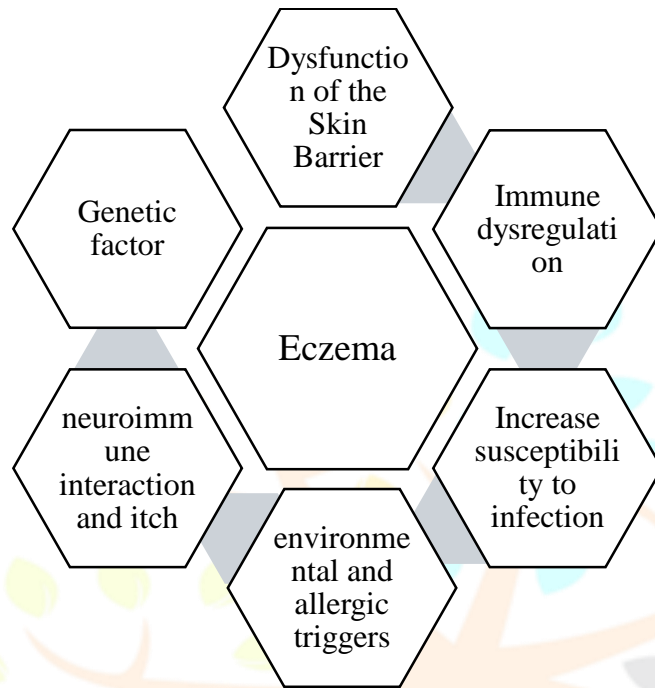


Fig No 1 Mechanism Action Of Eczema

1) Dysfunction of the Skin Barrier :-

- The skin barrier is impaired in AD patients, mostly as a result of a filaggrin deficit, which is a protein essential to skin barrier function. This increases the skin's permeability to irritants, bacteria, and allergies.
- Transepidermal water loss, or the loss of moisture from the skin, is a factor in dryness and heightened susceptibility to outside stimuli

2) Immune dysregulation :-

- Th2-dominant immune response: Th2 cells (T-helper type 2 cells) are overactivated in atopic dermatitis, which is characterized by an immunological response imbalance. These cells release cytokines that exacerbate itching and inflammation, such as IL-4, IL-13, and IL-31.
- A Th1 response, involving interferon-gamma, may also be activated in chronic stages of AD, adding to the duration and intensity of the inflammation.

3) Increase susceptibility to infection:-

- Staphylococcus aureus frequently colonizes the skin of AD patients, aggravating inflammation. Secondary infections can occur as a result of bacteria and viruses being able to more easily colonize the skin barrier due to damage.

4) environmental and allergic triggers:-

- Flare-ups can result from immunological reactions triggered by environmental allergens (such dust mites, pollen) and irritants (like soaps, detergents) that can permeate the compromised skin barrier.
- AD is also associated with elevated levels of IgE, indicating a heightened allergic sensitivity to external antigens.

5) neuroimmune interaction and itch :-

- A characteristic of atopic dermatitis is chronic itching, or pruritus, which is believed to be caused by both immunological and neurological processes.
- The activation of sensory neurons by cytokines such as IL-31 and nerve growth factors results in the sensation of itch, which in turn leads to scratching and more damage to the skin, thereby escalating the inflammatory cycle.

6) Genetic factor :-

- Genetic predispositions contribute to the compromised skin barrier and elevated vulnerability to the condition, such as mutations in the FLG gene (which encodes filaggrin).
- AD risk is also increased by a family history of allergies or atopic illnesses (such as asthma, allergic rhinitis).

7) .Symptoms :

- 1) Dry, scaly skin: The skin may appear flaky or cracked and feel rough.
- 2)Itching: Severe itching is typical, especially at night.
- 3)Patches that are red or brownish-gray: These can frequently be found on the hands, feet, ankles, wrists, neck, upper chest, eyelids, and inside the elbow and knee bends. The face and scalp are also typical locations in babies.
- 4)Skin that is thick, cracked, or leathery: This results from persistent itching and irritation
- 5) Little, raised bumps: If scraped, these can become crusty or leak fluid.
- 6) Sensitive, swollen skin: Scratching may cause the affected regions to swell or become tender.
- 7) Raw or broken skin: Scratching too much raises the risk of infection by causing open sores or leaking.

8) .Herbs:-

Herbs have been utilized for ages in traditional medical systems, such as Ayurveda, Traditional Chinese medical (TCM), and Western herbalism, to soothe and treat skin disorders like eczema. These herbal medicines help relax the skin, lessen irritation, and encourage healing since they frequently have anti-inflammatory, antibacterial, and calming qualities.

The condition of the patient, the kind of eczema, and the method of application all influence how well herbs work as eczema treatments. While some herbs are consumed orally as teas or supplements, others are applied externally as oils or lotions. While herbal remedies might be helpful, it's vital to remember that they might not be suitable for

everyone and that you should always see a healthcare professional before using them, particularly in severe circumstances. **There are some following herbs in treatment of eczema:-**

- 1)Aloevera
- 2)Rosemary
- 3)Turmeric
- 4)Sheabutter
- 5)Neem
- 6)Plantain
- 7) lavenderGerman chamomile
- 9) Witch hazel
- 10)Milk thistle
- 11)Comfrey
- 12) Oat (Avenasariva)
- 13) Dandelion
- 14) Honey
- 15) Burdock
- 16) Calendula



fig no2.Alove vera



Aloe vera

Synonym:- Aloe barbadensis

Family :-Asphodelaceae

Aloe vera contains antiinflammatory, antioxidant, antimicrobial, anticancer, immunological boosting and hypoglycemic effects. It has long been used to treat a wide range of illnesses. It is administered externally to treat psoriasis, soothe irritated skin, and aid in the healing of wounds (Vogler and Ernst, 1999).[9] Additionally, it is taken internally (Eshun and He, 2004)[10] to treat liver diseases such as hepatitis (Bottenberg et al., 2007),[11] diabetes mellitus (Bunyaphatsara et al., 1996), [12].heart burns, and dyspepsia (Langmead et al., 2004)[13]. Extracts from A. vera have antibacterial and antifungal properties (Ferro et al., 2003)[14].The eczematous skin is directly treated with its gel. Its hydrating properties make the skin smoother and promote quick healing of wounds. Numerous individuals noted a reduction in eczema symptoms, including dryness, scaling.The gel is applied externally to mild skin irritations, such as burns, bruises, and abrasions, as well as inflammatory skin conditions. It is advised to apply newly made gel due to its susceptibility to microbiological, oxidative, or enzymatic destruction. Certain bacteria and fungi are harmed by the properties of the gel. For four weeks, a lotion with 0.5% aloe reduced the psoriasis-related skin "plaques" (Syed et al., 1996).[15]

Partial thickness burns improved with the use of gel (Kaufman et al., 1988).[16] The gel seems to help the skin recover from frostbite injury when it is administered (Miller and Koltai, 1995)[17]. It might postpone the onset of skin damage both during and after radiation therapy (Olsen et al., 2001).[18]

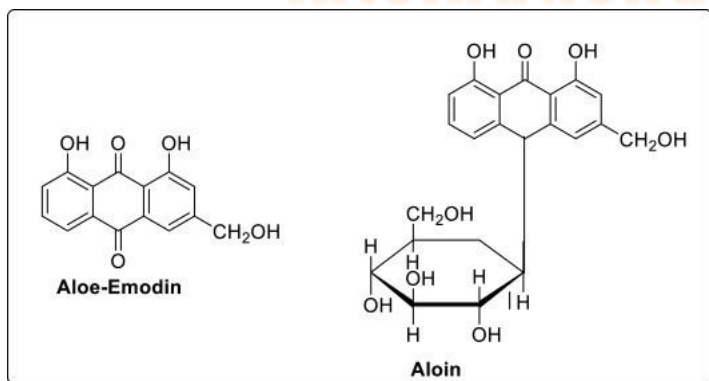


fig no3.chemical structures of phytoconstituents present in aloe vera



Fig no 4. Rosemary

Rosemary

Botanical name : *Rosmarinus officinalis* L.

Family : Lamiaceae

Native to the Mediterranean region, *Rosmarinus officinalis* is a woody herb with aromatic, evergreen, needle-shaped leaves. Atopic dermatitis has long been treated with rosemary essential oil, which is extracted from the plant's leaves and contains anti-inflammatory, anti-microbial, and antioxidant properties. Because rosemary contains a variety of phenolic compounds, including rosmarinic acid, carnosol, and carnosic acid, it may have biological activities.

The in-vitro antibacterial, antioxidant, anti-inflammatory, and analgesic properties of rosemary flower extracts were assessed by Karadag et al., and the findings validated the herb's traditional use as an anti-inflammatory agent (Karadağ et al., 2019).[19]

Terpenes, specifically 1,8-cineole, a highly effective anti-inflammatory component, were found in the essential oil produced from rosemary blossoms (Santos and Rao, 2000).[20] Additionally, rosemary extract was discovered to be highly efficient against *Staphylococcus aureus*, which tends to exacerbate inflammation in eczema patients, preventing the illness from getting worse.

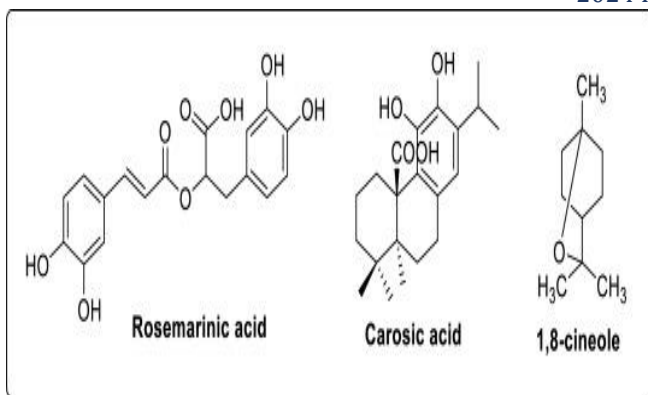


fig no.5. Chemical structures of phytoconstituents present in Rosemary



fig no 6. Turmeric

Turmeric

Synonym:- *Curcumadomestica*

Family :- Zingiberaceae

'Kurkum' is the Saudi Arabian name for *C. longa*). The Arabic term Al-Kurkum is translated into Latin as *Curcuma*. According to Mighid (1978), [21] it is a little rhizomatous perennial herb. It is indigenous to southwest India and needs high yearly rainfall and temperatures between 20 and 30°C to flourish (Prasad and Aggarwal, 2011) [22]. In the woods of South and Southeast Asia, turmeric grows wild. It is an essential component of Siddha treatment and has been used for thousands of years throughout Asia. Prior to being utilized for its therapeutic qualities, it was employed as a dye (Chattopadhyay et al., 2004). [23]

Turmeric was used as a medication in the Siddha system to treat a variety of ailments, such as liver disorders, aches, pains, wounds, sprains, and ailments of the gastrointestinal, respiratory, and skin systems. Numerous skin problems, such as eczema, chicken pox, shingles, allergies, and scabies, are frequently treated with a fresh juice. Because of its

purported antibacterial qualities, it has been used traditionally for thousands of years in India to treat liver and stomach problems as well as to treat wounds topically (Chaturvedi, 2009).[24]

It has been used extensively in Asian traditional medicine for more than 4,000 years to treat conditions like arthritis, gall bladder issues, liver issues, jaundice, and appetite loss. Turmeric's antioxidant (Ramirez-Bosca et al., 1995)[25] and anti-inflammatory (Satoskar et al., 1986) [26] qualities have been linked to its hepatoprotective effects. Furthermore, sodium curcumin, a salt of curcumin, has choleric effects by promoting the biliary excretion of cholesterol, bilirubin, and bile salts, which supports its use in the treatment of cholelithiasis (Al-Asmari et al., 2014).[27]

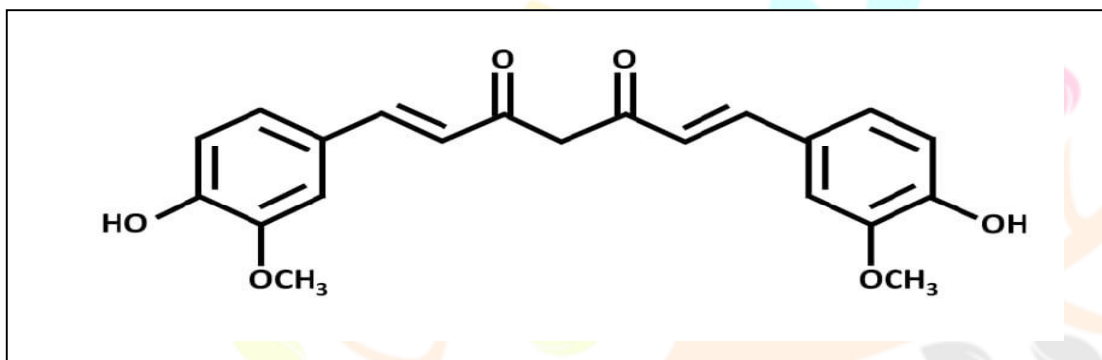


fig no.7. chemical structure of turmeric



fig no.8.Shea butter

Shea Butter:-

It was discovered that the high stearate fat obtained from the seeds of the Sheu tree (*Vitellaria paradoxa* C.F. Gaertn.), a member of the Sapotaceae family, was enhanced with a high concentration of vital minerals and proteins. It was

also discovered that the oil content and sterol levels were higher, primarily consisting of triglycerides containing linoleic, oleic, stearic, and palmitic fatty acids. The substantial levels of unsaponifiable fats included phenols, triterpenes, tocopherols, and sterols, which are responsible for the fat's anti-inflammatory and antioxidant qualities and are used to treat a variety of skin conditions (Lin et al., 2018).[28] Because of its anti-inflammatory and antioxidant properties, it is utilized in the production of topical ointments that are used to treat eczema.

In a pilot study, Zoe Diana Draelos et al. assessed the effectiveness of a botanical moisturizer cream that contained dimethicone, shea butter, and other humectants. After two weeks of use, the patients' condition significantly improved as the cream significantly reduced itching, inflammation, irritation, roughness, dryness, and erythema while also restoring skin hydration (Draelos, 2016).[29]

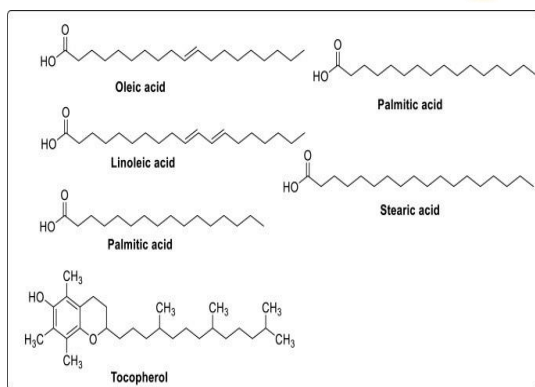


Fig no .9. Chemical structures of phytoconstituents present in shea butter.



Fig no 10 Neem

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Family:-Meliaceae

Botanical Neem :Azadirachtaindica

Ayurvedic medicines have traditionally used plant parts such as fruits, seeds, oil, leaves, bark, or roots. Since ancient times, neem has been utilized as a therapeutic aid in the treatment of a wide range of illnesses. It is a component of homeopathic, unani, and ayurvedic medications, which claim to be able to cure any illness. The anti-inflammatory, anti-ulcer, anti-malarial, antifungal, immune-modulatory, anti-hyperglycemic, antibacterial, antiviral, antioxidant, anti-mutagenic, and anti-carcinogenic properties of neem and its components have been demonstrated.

Neem oil applied to the skin may help reduce eczema-related irritation and itching.

Numerous related ailments can be cured by taking a bath in neem water, according to old customs. Neem applied topically may help reduce eczema-related irritation and itching (Debjit et al., 2010).[30]

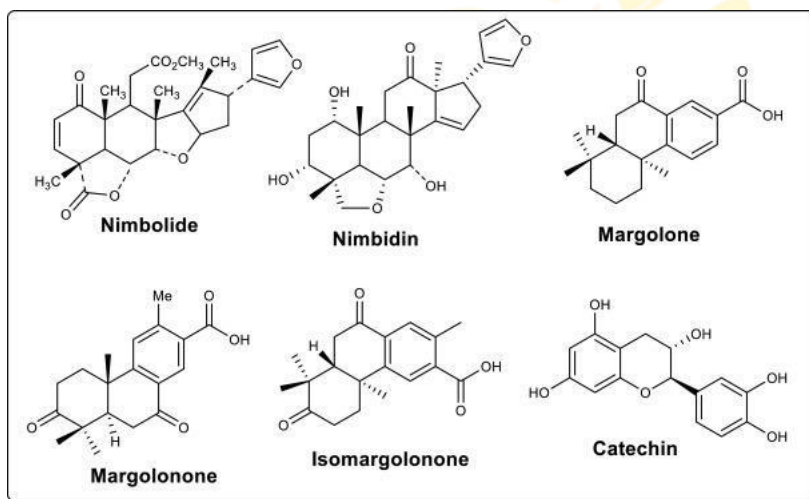


Fig no 11. Chemical structures of phytoconstituents present in neem.

9) .Several oil are commonly used for the treatment of eczema

- 1) Coconut oil
- 2) Olive oil
- 3) Jojoba oil
- 4)Sunfloweroil
- 5)Arganoil
- 6)Teatreeoil
- 7)Neemoil
- 8)Castoroil
- 9)Rose hip oil

1)Coconut oil :-

Large amounts of free fatty acids, such as lauric acid (49%), myristic acid (18%), palmitic acid (8%), caprylic acid (8%), capric acid (7%), oleic acid (6%), stearic acid (2%) and linoleic acid (2%) were found in the kernels of mature coconuts harvested from the coconut palm (*Cocosnucifera* L. family *Arecaceae*). By decreasing trans-epidermal water loss and increasing skin capacitance, topical administration of virgin coconut oil to individuals with mild to severe atopic dermatitis improved the barrier function and lessened the severity of the condition (Lin et al., 2018) [28]Improved barrier function, increased moisturizing capacity, and strong antibacterial potential were among the positive results. Oil's safety profile makes it a prime option for the treatment of atopic eczema.

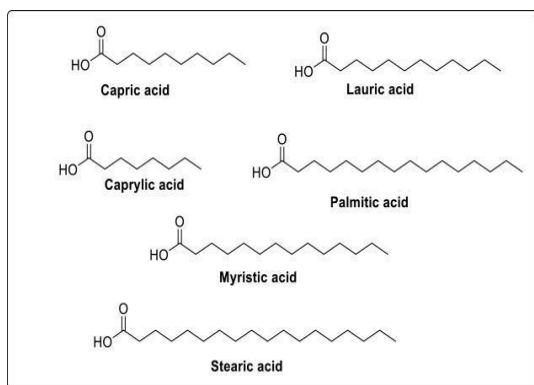


Fig no 12.Chemical structures of phytoconstituents present in coconut oil.

2) Olive oil :-

The primary use of the fruits of *Olea europaea* L., a member of the *Oleaceae* family, has been in the industrial extraction of olive oil, which is used as a component of many skin and hair products. The main component of olive oil is oleic acid, which is also present in linoleic acid and palmitic acid. Along with key phenolic components including phenolic acids, phenolic alcohol, flavonoids, lignans, and seco-irridoids, about 200 other types of chemical compounds have been detected in the plants, including sterols, carotenoids, triterpenic alcohols, and phenolic compounds. It was discovered that these hydrophilic phenolic compounds had anti-inflammatory and antioxidant properties. The disruption of the skin's barrier caused by the presence of monounsaturated free fatty acids, such as oleic acid, increased the permeability of oil and its constituents, leading to the management of eczema through topical application. The integrity of the skin barrier's water permeability was directly impacted by linoleic acid derived from oil (Lin et al., 2018).[28]

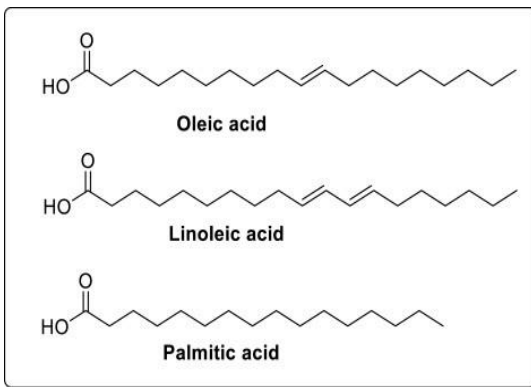


Fig no.13 Chemical structures of phytoconstituents present in olive oil.

3)Jojobaoil:-

C.K. Schneid obtained oil from *Simmondsiachinensis* (Link). (Family: Simmondsiaceae) showed anti-inflammatory properties and has potential applications in the treatment of several skin conditions. Additionally, it was used to prepare cosmetic formulations such as sunscreens and moisturizers. The jojoba plant produces wax esters and long-chain fatty acids that are used to treat disorders such as atopic dermatitis, eczema, and seborrheic dermatitis that damage skin barriers (Lin et al., 2018; Pazyar et al., 2013).[28,31]] Jojoba oil was used in a topical formulation developed by E. Soudant et al. that has been shown to enhance skin barrier functions and improve skin texture (Soudant et al., 2018).[32]

10).Advantages :-

1]Antibacterial and Antimicrobial Properties:

2]Lower Chance of Adverse Reactions:

3] for Sensitive Skin:

4]anti-inflammatory qualities 5]Effects of moisture:

6] Antimicrobial benefits:

11).Eczema: what causes it ?

The body is shielded from the environment by healthy skin. People with eczema have dry skin, and occasionally their skin breaks and cracks. The skin can then become irritated by germs or other environmental factors. The body's defense mechanism against illness, the immune system, is triggered by this. The immune system defends itself, but occasionally it does so excessively! This can cause inflammation, which is characterized by red, itchy skin.

What causes eczema in humans? Both environmental variables and your genes, which contain the information that defines your features and characteristics, may be involved. A persistent alteration, or mutation, in the DNA of some eczema sufferers prevents their bodies from producing a protective layer of skin [33]. People with this mutation may experience more severe and earlier onset of eczema. Eczema belongs to a group of illnesses known as atopic disorders.

it is also atopic sensitive to environmental irritants and allergies.comprises environmental and food allergies as well as asthma. Eczema is more common in some persons than others. Researchers discovered that a child is three to five times more likely to have an atopic condition if both parents have it [34]. Additionally, some physicians have discovered that children who live in urban regions may be more susceptible to eczema than children who reside in rural areas [35]

12) .Some Synthetic Medicine used for Treatment of Eczema :-

Drugs name	Types	Brand name	Used	Drug class	year
1. Adbry	njection	tralokinumab ldrm	Adults with moderate to severe atopic dermatitis (eczema) can be treated with the prescription drug Adbry (tralokinumab-ldrm).	interleukin nhibitors	2021
2. Cibinqo	Pills	Abrocitinib	used to treat adults and adolescents (12 years and older) with moderate-to-severe atopic dermatitis, also referred to as eczema.	Selective mmuno suppressant	2022
3. Dupilumab	njection	Dupixent	It helps to lessen symptoms like itching, redness, and swelling by focusing on particular immune system pathways that fuel inflammation.	interleukin nhibitor	2017
4. Crisaborole	topical ointment	Eucrisa	aids in lowering eczema-related inflammation, redness, and itching.	Miscellaneous topical agent	2016
5. Opzelura	Cream	Ruxolitinib	topical drug used to treat atopic dermatitis, or eczema,	Topical antineoplastic	2021

			in adults and children older than twelve. It functions by preventing the immune response-related enzymes JAK1 and JAK2 from functioning. This aids in lowering inflammation.		
5. Tacrolimus	Ointment	Protopic	aids in relieving and preventing flare-ups by lowering the redness, itching, and inflammation linked to eczema.	Miscellaneous Topical agent	1994
7. Rinvoq	Oral tablet	Jupadacitinib	used to treat moderate to severe eczema in adults and children aged 12 and up.	Antirheumatic	2019
8. Pramoxine	Cream	Caladryl, Tronolane	Pramoxine used is applied topically to reduce itching and pain from a variety of skin disorders, including eczema. It functions by numbing the skin and lessening pain or itchiness.	Topical anaesthetics	1958
9. Prednisone	Tablet	Deltasone	can be used to treat eczema, especially in more severe instances, as a corticosteroid drug. It aids by lessening skin irritation, edema, and inflammation.	Glucocorticoid	1955
10. Doxepin	Tablet	Sinequan	used to help people with specific forms of eczema who are itchy Year 1969	Topical Antihistamine	1969

11. Imuran	Tablet	Azathioprine	Imuran functions by inhibiting the overreactive immune response, which frequently contributes to eczema symptoms and inflammation.	Antirheumatics	1968
12. Pimecrolimus	Cream	Elidel	reduces swelling, redness, itching, or rashes caused by skin conditions, such as eczema.	Miscellaneous topical agent	2004

Conclusion :-

The presented overview functions as a kind of showcase for medicinal plants that offer specific therapeutic advantages for the treatment of dermatitis. Herbs have the potential to become extremely effective therapeutic tools in the future for the treatment of excruciating and incapacitating long-term skin disorders. The medicinal herbs that have a particular therapeutic power to treat eczema and reduce discomfort for patients. The particular active ingredients found in the plants were really in charge of various pharmacological effects and assisted in regulating physiological processes such as inflammation, permeability, and skin barrier homeostasis, which helped the patient feel better. For the dry skin, several plant extracts also served as humectants or moisturizers.

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