



Phytotherapy for Skin

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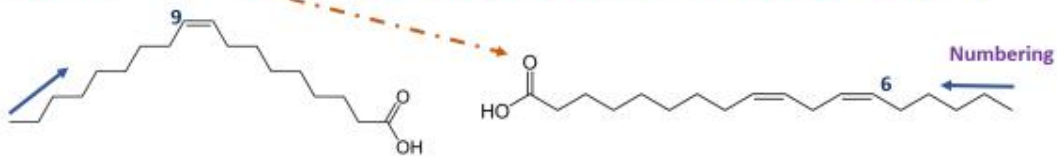
Dry/ itchy skin and eczema

- These conditions are very common, and should be carried out by a medical practitioner in order to exclude infection or any other serious disorders.
- Emollients, such as oil-based preparations based on arachis oil, or oat extracts, are usually the first line of treatment.
- Plant extracts can often be incorporated into these preparations and can be very useful.



Arachis oil:

- Arachis (also known as ground nut or peanut **الفستق-القول السوداني**) is expressed from *Arachis hypogaea* (Fabaceae).
- It is a fixed oil consisting mainly of glycerides of oleic ($C_{18}H_{34}O_2$, monounsaturated omega-9 fatty acid) and linoleic acids ($C_{18}H_{32}O_2$, is a polyunsaturated omega-6 fatty acid).



- It is an ingredient of emollient creams and bath oils.
- Peanuts are dangerously allergenic to some individuals, and the oil should be avoided in these patients as a precaution.



Oats (*Avena sativa*) الشوفان – Gramineae نجيلة

- Widely distributed crop.
- The seeds, with the husks removed, are crushed to form a coarse powder, which is creamy white in color.

Constituents:

- ❖ **Proteins** (avenin, avenalin and gliadin).
- ❖ **Polyphenols** called avenanthramides.
- ❖ **Starch**.
- ❖ **Soluble polysaccharides**.
- ❖ **Saponins**: avenacosides A and B, and soyasaponin.
- ❖ **Fatty acid** that is composed of phytosterols including cholesterol, β -sitosterol, Δ^5 -avenasterol, avenoleic acid, linoleic acid and vitamin E.

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Therapeutic uses:

- **Emollient**; a colloidal fraction is used in bath preparations for eczema, itchy or dry skin, often with success, especially if used regularly over a long period.
 - **Anti-inflammatory and anti-irritant**: cells treated with avenanthramides showed a significant inhibition of TNF-alpha-induced NF-kappaB activity and a subsequent reduction of **interleukin-8 (IL-8)**. {Interleukin-8 is a key mediator associated with **inflammation** where it plays a key role in neutrophil recruitment and neutrophil degranulation}.
- Topical application of avenanthramides mitigated (relieved) inflammation in murine (related to mice) models of hypersensitivity and neurogenic inflammation and reduced itching in a murine itch model.
- ☐ Therefore, the anti-irritant activity of oats is thought to be mediated by avenanthramides.
 - **Protective and water-holding effect (moisturizer)**, owing to its content of starch and beta-glucans (polysaccharides).
 - **Antioxidant and anti-inflammatory effect**, due to the polyphenolic compounds.
 - **Strong ultraviolet absorbers**, due to some phenols.

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- **Cleansing activity**, due to saponins.
- **Sedative effect**, oat tinctures when taken internally, but this has not been proved yet.
- **Cholesterol-lowering effect** owing to its content of saponins and polysaccharides.

Inflammatory Skin Conditions:

- Allergic reactions, psoriasis, burns, bruising and general inflammation of skin are common.
- Severe cases are treated with corticosteroids as well as with emollient preparations, ideally under medical supervision.
- However, minor disorders respond well to phytotherapy, with soothing and anti-inflammatory herbal products.

Aloe vera (barbadensis):

Constituents:

- **Polysaccharides, glycoproteins, enzymes** such as carboxypeptidases and **anthraquinone glycosides**.

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Therapeutic uses:

- Aloe vera is mainly in the form of pure gel, and applied as a lotion.
- ❖ For dermatological preparations, there is some evidence of **antibacterial**, **anti-inflammatory**, **emollient** and **moisturizing** effects. **The polysaccharides and some glycoproteins are soothing and immunostimulating agents**, while **anthraquinone derivatives are antibacterial**.
- ❖ Enzymes extracted from aloe vera were shown to be **analgesic** and to **inhibit thermal damage** and **vascular permeability** in mice.
- ❖ Antioxidant and induces carcinogen-metabolizing phase I enzymes {**In phase I, enzymes such as cytochrome P450 oxidases introduce reactive or polar groups into xenobiotics**}.
- ❖ For **stomach and mouth ulcers**.
- ❖ For **treatment of burns** and **aid in wound healing**.
- ❖ For **treatment of psoriasis**; comparable as triamcinolone acetonide 0.1% in reducing the clinical symptoms (a recent study). **In uv-induced erythema, it was superior than hydrocortisone 1% (in placebo gel) as anti-inflammatory**. This supports its use as an **after-sun treatment** and **post-radiotherapy emollient**.

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Evening primrose oil (*Oenothera biennis*) الأخرية المحولة:

- *Oenothera* is a common perennial ornamental plant whose use in Western phytomedicine was inspired by that of North American Indians.
- Now, it is the seed oil that is used for atopic eczema.



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Constituents:

- The seed oil contains 70% *cis*-linoleic acid and about 9% *cis*- γ -linoleic acid.

Therapeutic uses:

- The oil has been extensively investigated, and its therapeutic benefits have been ascribed mainly to its content of γ -linoleic acid.
- It is either taken internally or applied externally to patients with **atopic dermatitis** (eczema). It supplements patients with this dermatological disease with **omega-6 essential fatty acids**. It has been found that patients with atopic dermatitis display imbalances in omega-6 essential fatty acid levels.
- Omega-6 essential fatty acids play a vital role in skin structure and physiology and deficiency replicates the symptoms of atopic dermatitis.
- To date, studies concerning the effect of these fatty acids on atopic dermatitis have **conflicting** result, although a systemic review has concluded a beneficial effect of evening primrose oil in ameliorating the symptoms of the dermatological disorder, and this effect becomes apparent after 4 to 8 weeks from the initiation of the treatment.

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- The main indications for which clinical evidence exists are:
 - Atopic dermatitis especially in infants.
 - Mastalgia.
 - Rheumatoid arthritis.
 - Premenstrual syndrome {Premenstrual syndrome (PMS) refers to physical and emotional symptoms that occur in the one to two weeks before a woman's period. Symptoms often vary between women and resolve around the start of bleeding. Common symptoms include acne, tender breasts, bloating, feeling tired, irritability, and mood changes}.
 - ❖ Evening primrose oil is usually taken in conjunction with vitamin E to prevent oxidation.
 - ❖ The seed oil of *Borago officinalis* , also known as Star Flower oil (Borage المحمم الحنظل-المخزني) is used in the same way as evening primrose oil, and it even contains 2-3 times more γ -linoleic acid.



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Marigold (*Calendula officinalis* – Asteraceae) (البكورية الطبية أو الأذريون الطبي) :

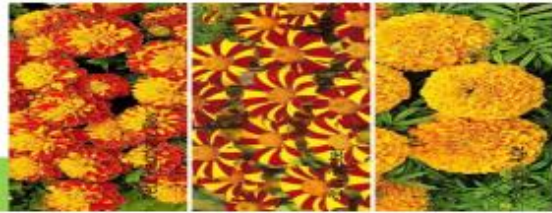
- Native to southern Europe.
- It is one of the best known medicinal European plants, and it has a long history of pharmaceutical use.



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Constituents:

- Marigold flowerheads contain **saponins** (e.g. calendasaponins A, B, C and D).
- **Triterpene pentacyclic alcohols** (e.g. faradiol, erythrodiol and calenduladiol).
- **Flavonoids** (e.g. rutin).
- **Sesquiterpene glycosides**.
- **Volatile oil and polysaccharides**.



Marigold

Therapeutic uses:

- ❖ In **inflammatory** skin conditions, such as topical application for wound healing and after radiotherapy owing mainly to marigold flowerhead content of lipophilic triterpene alcohols, notably the esters of faradiol. This evidence was demonstrated in vitro models of edema and irritation in mouse ear.
- Marigold extracts prevented glutathione (GSH, an antioxidant) depletion in mouse skin after an oral administration and increased gelatinase activity, which may be beneficial for skin healing and procollagen synthesis.
- ❖ Also in **wound healing**, both oral and topical application of *Calendula* flower ... 25

... extracts improved healing of incision wounds in rats and reduced the time needed for re-epithelization.

Mechanism of this:

1. Extractions **stimulated** proliferation and migration of fibroblasts at low concentrations.
2. Volatile oil acts as **antibacterial** and **antifungal** *in vitro* trials, a result that supports the use of marigold for wound healing.

❖ **Immunostimulant** due to the polysaccharide content.



Witch hazel (*Hamamelis virginiana*) بندق الساحرة:

- Indigenous to North America and Canada.
- Its extract is mainly used as an astringent in skin and eye inflammation.

Constituents:

- The leaves and bark are rich in tannins (e.g., hamamelitannin).



Therapeutic uses:

- Widely used for the treatment of hemorrhoids, bruises, skin irritations, spots and redness of the eye.
 - ❖ Hamamelitannin inhibits TNF-mediated endothelial cell death without altering TNF-induced upregulation of endothelial adhesiveness. This illustrates and reasons the use of the plant drug as anti-hemorrhagic.
- The proanthocyanidins, gallotannins and gallates highly active as free radical scavengers.
- Witch hazel phenolics protect red blood cells from free radical-induced hemolysis.
- Witch hazel phenolics also exhibited some cytotoxic activity, preventing the proliferation of a melanoma cell line.
- Antiviral activity against *Herpes* viruses.
- Antiinflammatory in UV-induced burning and in atopic dermatitis as shown in clinical studies. In addition, an observational study in children (27 days up to 11 years) with minor skin injuries, diaper dermatitis, or localized inflammation found that hamamelis ointment to be as effective as dexpanthenol. Thus, it can be concluded that hamamelis ointment is both effective and safe as a treatment in certain skin disorders in children.
- Witch hazel is used in after-shave lotions and in cosmetic preparations.

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Wound healing

Centella asiatica (Apiceae) سرّة الأرض

- It is commonly known as Indian Pennywort and Brahmi.
- It is an important medicinal plant throughout the world.



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- It usually grows in along streams and in low wet areas, accordingly, it is prone to exposure to sewerage, and thus, contamination with bacteria and heavy metals.
- In certain countries such as Sri Lanka, it is an element in local cuisine used as a vegetable, or in salads.

Constituents:

- The pentacyclic triterpenes are the major constituent of the plant, including asiatic acid, asiaticosides, brahmoside, brahmic acid, brahminoside, centelloside and others.
- Flavonoids (kaempferol, quercetin, ...etc.).
- Volatile oils (α -humulene, β -caryophyllene, ... etc.).

Therapeutic uses:

- ❖ General **tonic**.
- ❖ **Skin conditions** including wound healing, inflammation, psoriasis (by inhibiting keratinocyte replication) , stretches during pregnancy.

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- ❖ Taken internally for **mental disorders to improve memory**, for **atherosclerosis**, to **improve venous insufficiency**.
- Despite the lack of clinical studies, pharmacological studies support its use in skin conditions.
- **Proposed mechanisms of acceleration of wound healing:**
 1. Extracts tested in a rat incision wound model improved the **rate of epithelization** and **wound contraction**.
 2. Stimulation of the **extracellular matrix accumulation** in rat experimental models.
 3. Asiatic acid stimulated **collagen synthesis**.
 4. Increased **collagen secretion**.

Pregnancy stretching

