

## Medicinal Plants as Anti-Ageing Materials: A Review

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### ABSTRACT

Natural plant compounds show a wide range of activities like anti-cancer, anti-inflammatory, and anti-ageing. Ageing is due to complicated biochemical processes. This review focuses on some natural compounds serve as anti-ageing materials. Some materials such as phenolics, carotenoids, terpenoids or alkaloids may have an important role as antioxidant compounds and as free radical scavengers. These constituents find at seeds, leaves, roots or fruits. Most of these materials can protect skin against wrinkle and other skin disease. Some of important anti-ageing plants are *Aloe vera*, *Vitis vinifera*, *Triticum sativum*, *Dioscorea villosa*, *Camelia sinensis*, etc.

**Key words:** herbs, antioxidant activity, free radical, phenolics, natural products.

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### Introduction

Approximately 80% of the population of developing countries rely on traditional medicines for their primary health care needs (Sharma *et al.*, 2011).

Many plant products from medicinal herbs can use as treatment and prevent diseases. Natural plant compounds are showing a wide range of activities like anti-cancer, anti-inflammatory, and anti-ageing (Verma *et al.*, 2009).

The medicinal plants contain several phytochemicals such as vitamins, carotenoids, terpenoids, polyphenols, alkaloids, tannins, saponins, etc. These compounds have antioxidant activities, which can be used in the treatment of multiple ailments (Sharma *et al.*, 2011).

Phenolic compounds are capable of inhibiting free radicals so, can retard the ageing process. Ageing causes pathogenesis of the skin (Vioux-Chagnoleau *et al.*, 2006).

Ageing is due to complicated biochemical processes in which the involvement of reactive oxygen species (ROS) and free radicals have been implicated.

Ravichandran *et al.* (2005), reported that The “Anti-Wrinkle cream” is a polyherbal formulation recommended for the management of skin wrinkling, and it contains the extracts of *Aloe vera*, *Papaver rhoeas*, *Vitis vinifera*, *Citrus limon*, *Solanum lycopersicum*, *Santalum album*, *Rubia cordifolia*, *Saussurea lappa*, *Lens culinaris*, *Symplocos racemosa*, *Amomum subulatum*, *Curcuma longa*, *Glycyrrhiza glabra*, *Valeriana wallichii*, *Vetiveria zizanoides* and oil of *Triticum sativum*.

This review focuses on some medicinal plants and natural compounds serve as anti-ageing materials.

### Medicinal Herbs:

Leguminosae family contains isoflavones such as genistein (4,5,7-trihydroxyisoflavone) and daidzein (4,7-dihydroxyisoflavone) which are phyto-estrogens. These compounds improve quality of the skin and reduce ageing (Brand *et al.*, 2001). The isoflavones have a phenyl group attached to the 3-position as opposed to the 2-position found in flavones. An example of an isoflavone would be the genistein and daidzen already mentioned above.

Wild yam (*Dioscorea villosa*) and butcher’s broom (*Ruscus aculeatus*) have diosgenin and ruscogenin (1- $\beta$ -hydroxydiosgenin), respectively. The diosgenin is converted to progesterone. Ruscogenin can use for the inflammatory. Fenugreek (*Trigonella foenum-graecum*) is another source of diosgenin.

Plant oils extracted from seeds have fatty acids which can provide emolliency and skin protection against drying.

*Luffa cylindrical* has photprotective effects. The seeds of this plant contain oil in which the fatty acids are stearic and linoleic acids are unsaturated fatty acids which have free radical scavenging properties (Satyavati *et al.*, 1976; Gupta and Sharma, 2006).

Avocado (*Persea gratissima*) oil has shown great effect on the skin, regarding to repairing and calming effect. It may be due to the presence of phytosterols and other derivatives such as campesterol, stigmasterol, brassicasterol and tocopherols (Leung, 1980).

Another plant is *Hydrocotyle asiatica*. One of its constituents is asiaticoside which works to stimulate skin repair and strengthen skin, hair, nails and connective tissue (Kartnig, 1988).

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Gamma-linolenic acid from evening primrose (*Oenothera biennis*) oil can help persons with low metabolism of this material (Evans, 1989). It has an anti-inflammatory effect on the skin (Graham, 1984; Dweck, 1991). This compound can find in other plant oils such as borage oil (*Borago officinalis*) and rosehip oil (Moreno Gimenez *et al.*, 1990).

*Piper longum* produce piperine which has antioxidant activity so, it is used in the cream against sunburn (Koul *et al.*, 1993).

Soya (*Glycine max*) contains  $\beta$ -sitosterol, daidzen and genistein, which are anti-inflammatory and cell regenerating.

*Aesculus hippocastanum* or horse chestnut (by producing esculin) has anti-inflammatory effects. (Weiss, 1986; Fluck, 1988).

Resveratrol (3,5,4-trihydroxy-trans-stilbene) is a stilbenoid, a type of natural phenol, and a phytoalexin produced naturally by several plants when under attack by pathogens such as bacteria or fungi (Mishra, 2011).

In grapes, resveratrol is found primarily in the skin (Roy and Lundy, 2005) and in muscadine grapes also in the seeds. It is antioxidant, anti-inflammatory, anti viral and protects against cancer, diabetes, alzheimer and other brain disorders (Mishra, 2011).

The roots of *Pueraria mirifica* contain daidzein and genistein and some other fascinating steroids and hormonal materials.

Grape seeds (*Vitis vinifera*) show another group of compounds named procyanidins (Passwater and Kandaswami, 1994).

*Terminalia chebula*, contains ascorbic acid, gallic acid and ellagic acid, which scavenge free radicals (Naik *et al.*, 2002).

*Aloe vera* (*Aloe barbadensis*) can protect skin against radiation (Reynolds and Dweck, 1999).

Kaempferol is a flavonol and show skin healing effects. This compound is found in marigold (*Calendula officinalis*), Indian pennywort (*Centella asiatica*) and purple coneflower (*Echinacea purpurea*).

Pigweed (*Portulaca oleracea*) has antiphlogistic (takes the heat out), antibacterial and antidiabetic effects and can use as refreshing agent (Boulos, 1983; Nadkarni and Nadkarni, 1999).

Flavones such as apigenin and luteolin (Dweck, 2002) show also anti-inflammatory effects. Catechins, another flavonoids, can form procyanidins which are free-radical scavengers and anti-oxidants. Catechins and epicatechins can find in green tea (*Camelia sinensis*) or seeds of apple.

St. john's wort (*Hypericum perforatum*) contains hypericin and pseudohypericin can recover inflammatory effects (Bezakova *et al.*, 1999).

*Scopolia japonica* contains Scopoletin which indicate anti-inflammatory activity. Materials found in borage (*Borago officinalis*) can show this property (Gudej and Tomczyk, 1996).

Rutin found in the Graminae family and in buckwheat (*Fagopyrum esculentum*) (Dabrowska-Zamojcin *et al.*, 1995), *Anthriscus sylvestris* (Milovanovic *et al.*, 1994) and *Ginkgo biloba* (Joyeux *et al.*, 1995) has antioxidant activity and protects cells against lipo-peroxidation.

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