

NATURAL TRENDS

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Introduction

The personal care market is becoming obsessed with a number of concepts which seem to have become the norm for most marketers. There is a growing use of endorsements for ethical issues, sustainable crops, environmentally conscious materials, organic ingredients and products that have been fair traded. There is an increasing use of organisation badges, so that a product label can now resemble the arm of a well-qualified boy scout. Products now seem to require certification from self appointed bodies or experts who can now make a comfortable living out of these non-legal requirements.

There are statements like: Clinically tested, dermatologically tested, ophthalmologically tested, X out of Y consumers tested found statements, before and after comparisons, certified for something or other. Products are increasingly natural, biodegradable, organically certified and/or fair traded. The not tested on animals remains a mandatory statement for most sellers.

Products are being based on spa and well-being, nostalgia, traditional medicine, environmental and sustainable issues, and crystal, gems or precious stones

Another meaningless force in the industry is to tell the consumer all the things that the product does not contain: no petrochemicals, no sulfates (USA for SLES, SLS etc), no SLS, no preservatives, no synthetic perfume, no parabens, no synthetic sunscreen (use ZnO, TiO₂), no animal derivatives (e.g. tallow, gelatin) etc., regardless of whether the statements have any meaningful validity or not. Petrol is a natural product, SLS does not cause cancer, inorganic sunscreens are very much chemical and parabens are very much found in nature. Marketing will soon hang itself with its own petard and they richly deserve all the problems they are going to create by using these unsound statements. Thankfully the use of medicinal claims is illegal and we will not have to endure the claims of the cure-all products of the 18th and 19th centuries.

Inspiration

The influence of the dietary supplement industry, and the exotic foods now available to us, is certainly starting to reflect in the additives we are using topically. In many cases the waste parts of the food industry like the skins, pips, peels and leaves are the starting points for many of the cosmetic industry's new raw materials.

The dietary supplement may have a totally different effect when taken internally to its effect when applied topically. There have been product ranges where an attempt has been made to sell a supplement with a complementary topical product, but they have not been commercially successful, mainly because topical products are merchandised in a different retail area to food supplements. The consumer is unable to make the link between the two different sections. Dealing with this topic is best considered by function of the supplement and then examining the topical attributes of a material.

The presented paper is a very small example of this vast market place.

The Wild Yam (*Dioscorea villosa*)

The Wild Yam (*Dioscorea villosa*) was the source of diosgenin (Fig. 1), a steroidal saponin used as the starting point for the commercial source of pregnanolone (Fig. 2) and progesterone (Fig.3) used as the first birth control pills. The root of *Dioscorea* is used for numerous purposes, but the major use is for the suppression of menopausal symptoms like hot flushes [Watson].

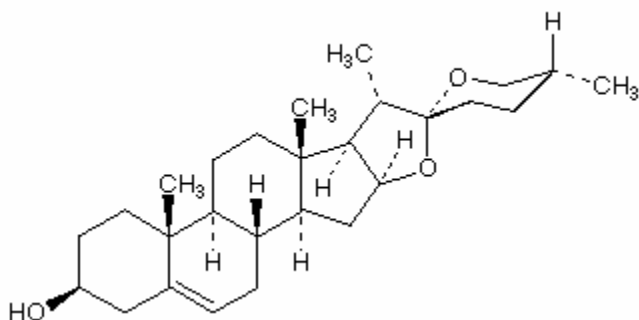


Fig. 1 diosgenin

During pregnancy, small frequent doses will help allay nausea [Lust; Grieve]. It is antispasmodic. It is valuable neuralgic affections, spasmodic hiccough and spasmodic asthma [Grieve].

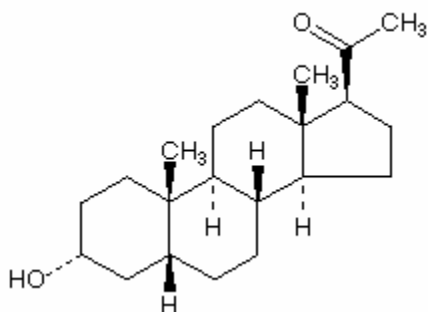


Fig. 2 pregnanolone

It is spasmolytic, a mild diaphoretic. It has potential in skin care and body care being anti-inflammatory and anti-rheumatic.

It is also cited for dysmenorrhoea, ovarian and uterine pain [British Herbal Pharmacopoeia; Hoffman], perhaps showing the power of this herbal root.

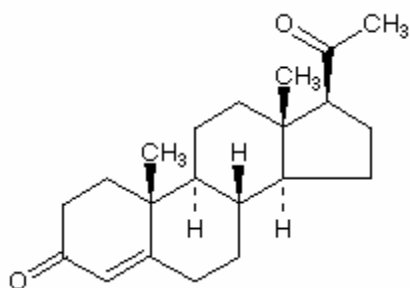


Fig. 3 progesterone

Chaste Tree (*Vitex agnus-castus*)

It is interesting to note that *Vitex agnus-castus* is a source of natural progesterone.

Both hyperprolactinemia and luteal phase defect have been pointed to as causal to premenstrual syndrome (PMS) and cyclic mastalgia. In clinical trials, chaste berry was shown to relieve both PMS, and, especially, breast swelling and pain. Compared to vitamin B6, chaste berry was superior in reducing mastalgia, premenstrual fluid retention, headache, and fatigue.

Proprietary preparations containing this material have been available in Germany since the 1950s and many documented studies have investigated the use of these products to treat various gynaecological disorders [Newall]. The fruit of *Vitex* contains essential oils, iridoid glycosides, and flavonoids. Essential oils include limonene, 1,8 cineole, and sabinene. The primary flavonoids include castican, orientin, and isovitexin. The two iridoidglycosides isolated are agnuside and aucubin. Agnuside serves as a reference material for quality control in the manufacture of *Vitex* extracts. One other report demonstrated delta-3-ketosteroids in the flowers and leaves of *Vitex* that probably contained progesterone and 17-hydroxyprogesterone [Brown]. The active constituents have been determined as 17- α -hydroxyprogesterone (leaf), 17-hydroxyprogesterone (leaf), androstenedione (leaf), δ -3-ketosteroids (leaf), epitestosterone (flower), progesterone (leaf), testosterone (flower and leaf) [Phytochemical and Ethnobotanical Databases].

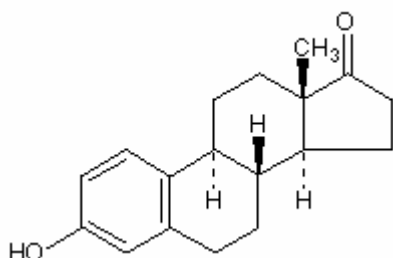


Fig. 4 estrone

It is highly unlikely that the diosgenin in the plant could ever be synthesised on the topical application to the skin to form a corticosteroid or hormonal derivative. However, it does seem likely that this material (being the precursor to these estrogenic molecules) will to some extent mimic the function of those pharmaceutical active materials and benefit the skin [Dweck, 2002]. It has not been exploited topically at the present time.

However, the production of wild yam was unable to sustain the demand for diosgenin as the starting precursor, for the production of birth control materials, which by this stage was dominated by estrone (Fig.4 estrone).

Fenugreek (*Trigonella foenum graecum*)

The world turned its attention to Fenugreek (*Trigonella foenum graecum*) for its source of diosgenin.

Fenugreek or Foenugreek seeds are emollient and accelerate the healing of suppurations and inflammations. Externally cooked with water into a porridge and used as hot compresses on boils and abscesses in a similar manner to the usage of linseed [Fluck].

Decoctions of whole plant are used as a bath for uterus infections. The seeds are tonic, restorative, aphrodisiac and galactagogue. Their emollient properties are useful for the itch. A cataplasm obtained by boiling the flour of the seeds with vinegar and saltpetre is used for swelling of the spleen [Boulos]. Extracts of the seeds are incorporated into several cosmetics claimed to have effect on premature hair loss, and as a skin cleanser [Iwu], and it is also reported in Java in hair tonics and to cure baldness [Leung]. Many of the herbal materials found to have an effect on hair growth have a hormonal or hormonal-mimetic basis.

Likewise there are a number of references to fenugreek having galactagogue (increase milk in nursing mothers) activity [Bunney; Burkill; Mills], which again is indicative of an estrogen-like activity. The plant should be used with caution as Fenugreek is reputed to be oxytocic and *in vitro* uterine stimulant activity has been documented [Newall *et al*], so the use of fenugreek during pregnancy and lactation in doses greatly exceeding those normally encountered in foods is not advisable.

Soya (*Glycine max*)

Soya contains β -sitosterol (Fig. 5) , genistein (Fig.6) and daidzein (Fig.7) as its major components. A supplement of soya rich in isoflavones is used for reducing hot flushes in menopausal women. The estradiol (Fig.8) might also be a contributing factor.

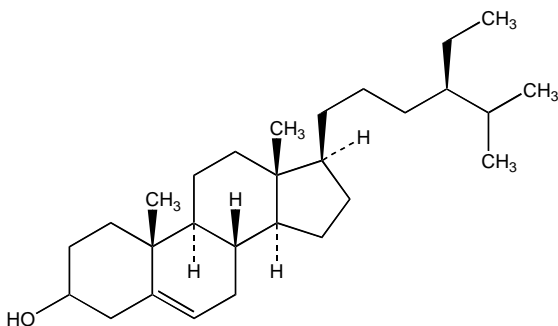


Fig. 5 β -sitosterol

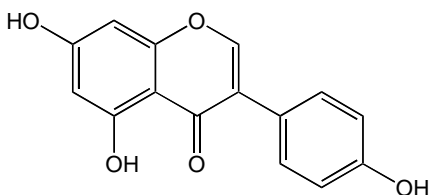


Fig. 6 Genistein

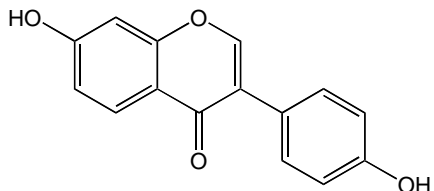


Fig. 7 Daidzein

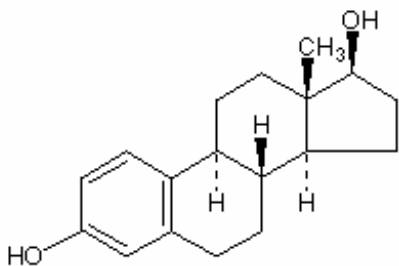


Fig.8 Estradiol

A plethora of raw materials exist in the cosmetic and toiletry industry that use this material. Typically, soya is a very useful cosmetic ingredient. It aids DNA repair after UV exposure, reduces sunburn cell reactions, protects against ADP decrease, stimulates collagen synthesis, increases skin firmness and reduces elastase activity.

A soy isoflavone blend incorporated with the isoflavones from Blackberry Lily are said to generate collagen, suppress the growth of terminal hair, suppress sebum production and also have a skin whitening effect.

A blend of Wild Yam and Soy claims to have improved skin elasticity, improved skin hydration, reduction in skin roughness, a smoothing of wrinkles and improved skin lipid content.

These are all good effects for use by menopausal or the more mature woman.

The presence of genistein and daidzein in combination with β -sitosterol is not unique to soy beans as other plant materials contain the phytochemicals.

Red Clover (*Trifolium pratense* L) (Leguminosae).

Red Clover is also a very popular remedy as the alternative for hormone replacement therapy and is sold extensively for this purpose. The plant also has a pharmaceutical license of right for the treatment of spots. A lotion of red clover can be used externally to give relief from itching in skin disorders and is specific for acne, boils and similar eruptions [Evans].

The flowerheads are used and they contain the isoflavones; biochanin A, daidzein, formononetin, genistein, pratensein, and trifoside. Biochanin A (Fig.9) and formononetin (Fig.10) are two isoflavones from red clover and are just like genistein and daidzein, except that they have methyl groups replacing the hydroxyl groups.

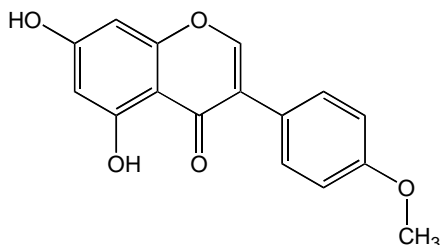


Fig.9 Biochanin A

These two isoflavones are considerably less estrogenic in their original forms, because the stereochemistry of the methoxy groups means they are not able to bind to the estrogen receptors as efficiently.

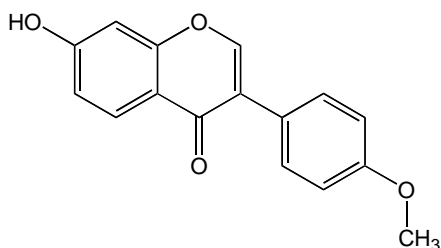


Fig.10 Formononetin

However, once these molecules are ingested, bacteria in the colon are able to remove the methyl groups - biochanin A becomes genistein and formononetin becomes daidzein. Daidzein can be further metabolized to equol (Fig.11).

Internally, biochanin A and formononetin are then able to be a source of considerable estrogenic activity.

The plant has alterative, antispasmodic, expectorant properties and is a sedative dermatological agent. Its main use is an alterative and for skin complaints such as psoriasis and eczema, as well as an expectorant use in coughs and bronchial conditions [Wren].

It may well be that these mechanisms give red clover its reputation as an alterative remedy, cleansing the system yet mild enough for many children's skin problems, even eczema. A lotion of red clover can be used externally to give relief from itching in skin disorders.

It is specific for acne, boils and similar eruptions, including eczema and skin problems especially where irritation is a factor [Evans].

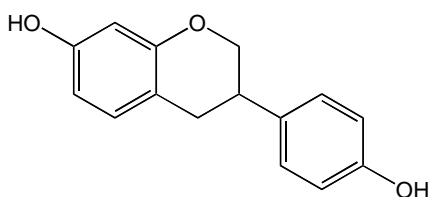


Fig.11 Equol

Historically, the flower tea has been used as an antispasmodic, expectorant and mild sedative. It is also recommended for athlete's foot, sores, burns, and ulcers. [Leung & Foster] and has been used in the herbal treatment of cancer, especially of the breast or ovaries [Mills].

Black Cohosh (*Cimicifuga racemosa*)

Black cohosh is stated to possess antirheumatic, antitussive sedative and emmenagogue properties. It has been used for intercostal myalgia, sciatica, whooping cough, chorea, tinnitus, dysmenorrhoea, uterine colic, and specifically for muscular rheumatism and rheumatoid arthritis [Newall *et al*]. The active component is likely cimigenol (Fig.12)

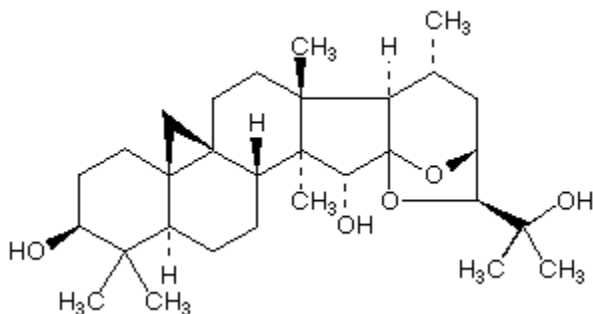


Fig. 12 Cimigenol

It was concluded *Cimicifuga racemosa* has an oestrogenic effect that has been demonstrated in both clinical and animal studies, providing evidence that the extracts provide an alternative treatment for symptoms associated with the menopause, and in particular for hot flushes [Duker *et al*].

It has little justification to be used topically and although the tincture can be used on rheumatic pain and sciatica, the effect is more likely to be seen internally. A reference has been seen for its use in foot baths and foot easing remedies.

Sweet Yellow Melilot (*Melilotus officinalis*)

This is another plant that contains daidzein, genistein and β -sitosterol. The flowering tops contain coumarin with a strong sweet almond smell which is released on drying. It is used to flavour certain dishes.

Although it might be expected that the plant should have similar properties to clover (its alternative name is sweet clover), this plant seems to be used to target cellulite. Cellasene is the new internal treatment that helps fight cellulite from within. Cellasene capsules contain a blend of plant extracts (the words on the pack say “*known for their natural action against cellulite and fatty deposits*”). Some of its active ingredients include dried ginkgo biloba extract, dried sweet clover extract, grape seed bioflavonoids, dried fucus vesiculosus extract, evening primrose and fish oils, and soya lecithin. In reality none of these materials apart from sweet clover are known for these effects.

The herb was formerly used to treat a number of different conditions, being carminative, expectorant, anti-thrombotic and antibiotic [Manniche]. Sweet clover tea is believed to help digestion. The flowers attract bees but repel moths. It has been used as a strewing herb. The leaves can be eaten as a vegetable but are a little bitter.

Melilot is soothing, lenitive, astringent, refreshing and anti-irritant and has similar properties to the red clover described above. It is also described as possibly having the additional properties of being anti-inflammatory, anti-oedema, a venous astringent (haemorrhoids) and anaesthetic [Council of Europe].

However, it is perhaps not the isoflavones at force here, but maybe the β -sitosterol or coumarin the roots contain.

Melilotus officinalis L. extract, containing 0.25% coumarin (Fig. 13) was studied on acute inflammation induced with oil of turpentine in male rabbits. *M. officinalis* had anti-inflammatory effects because it reduced the activation of circulating phagocytes and lowered citrulline production.

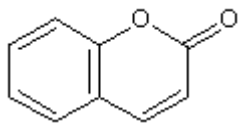


Fig. 13 coumarin

These properties were similar to those of hydrocortisone sodium hemisuccinate and coumarin. [Plesca-Manea *et al*]

Suma or Brazilian Ginseng (*Pfaffia paniculata*)

Suma has also been called “the Russian secret,” as it has been taken by Russian Olympic athletes for many years and has been reported to increase muscle-building and endurance without the side effects associated with steroids. This action is attributed to an anabolic-type phytochemical called *beta-ecdysterone* (Fig.14) and three novel ecdysteroid glycosides that are found in high amounts in suma. Suma is such a rich source of β -ecdysterone.

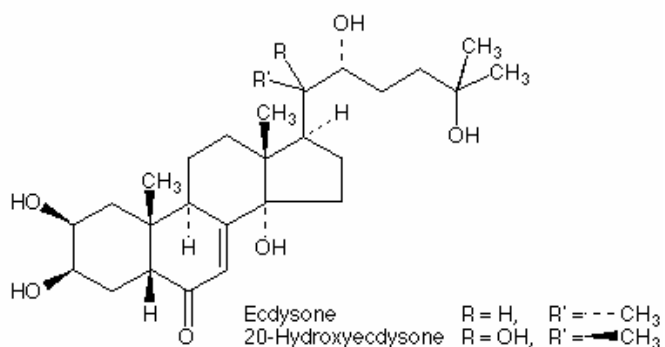


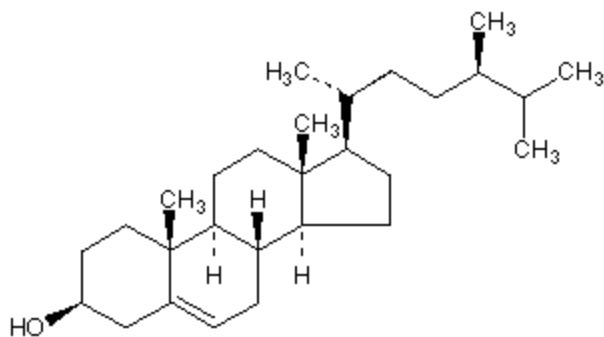
Fig. 14 β -ecdysterone

Suma contains a novel nortriterpenoid which has shown outstanding ability for the promotion and stimulation of peripheral blood circulation and regeneration of cells. Currently, this novel compound and its related structures are being screened for anti-neoplastic activity as a therapeutic drug.

Saw Palmetto (*Serenoa repens*)

The traditional indications for the use of saw palmetto include: cystitis, chronic bronchitis, asthma, diabetes, dysentery, indigestion, and for "underdeveloped breasts." The berries have also been thought to be an aphrodisiac. Modern usage of Saw palmetto is overwhelmingly for the treatment of benign prostatic hyperplasia (BPH). The berries contain approximately 1.5 percent volatile oil, of which 63 percent are free fatty acids and 38 percent are ethyl esters of those fatty acids. The fatty acids include: caproic, caprylic, capric, lauric, palmitic, and oleic acids, and ethyl esters of these. In addition, the berries contain beta-sitosterol, campesterol (Fig.15), Stigmasterol (Fig.16) and its glucoside, beta sitosterol D-glucoside, as well as ferulic acid.

Fig.15 Campesterol



Typically the plant is used for male pattern baldness, for its anti-allergic activity and anti-inflammatory effect. There are also a number of products where the plant is being recommended for its slowing in the growth of the hair (for example after shaving or the use of a depilatory). This seems to be in direct contract to the use of the plant for male pattern baldness!

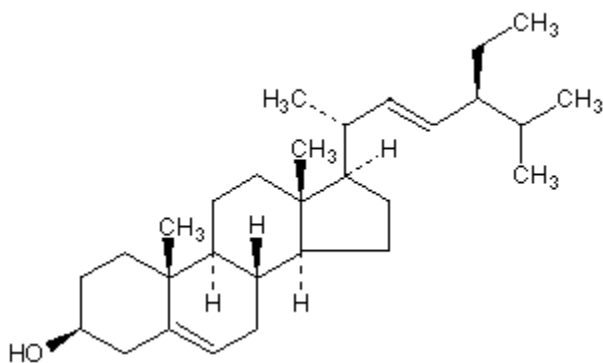


Fig. 16. Stigmasterol

Gotu Kola (*Centella asiatica*)

Centella asiatica is known as Indian Pennywort or Cotyle and is an important medicinal herb in India. It used traditionally as a nerve tonic for memory and clarity of thinking, for the therapy of anxiety and depression, and sometimes for indigestion. Its Sanskrit name is Brahmi, which may be translated as "knowledge", whilst in Tamil, it is known as *Mandukaparni*. An infusion of the leaves and stems has long been used in India for leprosy and other skin diseases. Asiaticoside [Bep Oliver] was found active against leprosy (by dissolving the waxy coating of *Mycobacterium leprae*) and an oxidized form, oxyasiaticoside, inhibited growth of tubercle bacillus *in vitro* (0.015 mg/ml) and *in vivo* [Lewis].

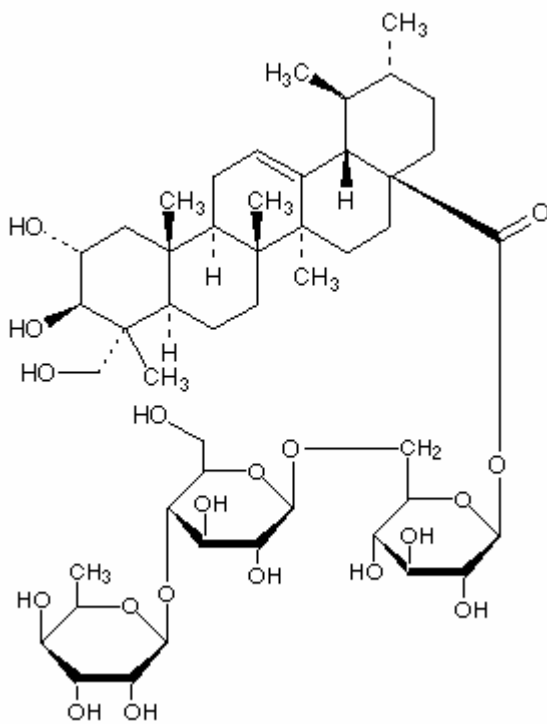


Fig. 17 asiaticoside

Centella asiatica extracts are used for the treatment of skin ailments, particularly ulcers, wounds, and for prevention of keloid and hypertrophic scars. *Centella* extracts have been found to accelerate wound healing, particularly in cases of chronic, post-surgical and post-traumatic wounds. Extracts have also been successfully used as a therapy in the treatment of second- and third-degree burns.

The pharmacological activity of *Centella asiatica* is thought to be due to several saponin constituents, including the asiatic acid and madecassic acid and each of these compounds stimulate the production of human collagen I, which is a protein involved in wound healing. Asiaticoside (Fig. 17) has been shown to be effective in speeding up the healing of superficial post-surgical wounds and ulcers by an acceleration of cicatricial action.

Topical application of asiaticoside has also been shown to promote wound healing in rats and significantly increased the tensile strength of the newly formed skin. Extracts of *Centella asiatica*, and in particular, asiaticoside, have also been shown to be valuable in the treatment of hypertrophic scars and keloids. Asiaticoside has been reported to decrease fibrosis in wounds, and was useful in preventing new scar formation. The mechanism is due to the effect of the plant on the synthesis of collagen and acidic mucopolysaccharides, and by the inhibition of the inflammatory phase of hypertrophic scars and keloids.

Asiaticoside is likely to interfere with scar formation by acting on myofibroblasts and immature collagen [WHO]

Liquorice (*Glycyrrhiza glabra*)

Liquorice has been known for generations. Theophrastus recommended it for quenching the thirst, to combat cramps caused by stomach ulcers and asthma. Napoleon chewed liquorice root regularly and eventually blackened his teeth [Schauenberg].

Liquorice is one of the most commonly used plant materials in Chinese Traditional Medicine and various species are used *Glycyrrhiza glabra*, *G. uralensis* and *G. inflata*. The roots are used for all meridians and their taste is sweet. The root is used to assist the spleen, restore Ch'i, dispel heat and treat sore throats and food poisoning. It is most often used with other herbs to mediate their effects [Tang]. It was introduced into Britain by the Black Friars in the 16th century and later was cultivated extensively in the Pontefract district of Yorkshire [Gordon].

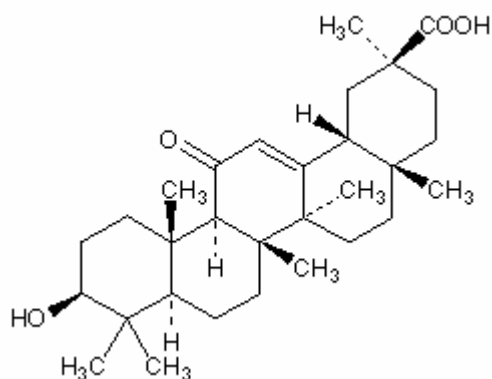


Fig. 18 glycyrrhetic acid (enoxolone)

Glycyrrhizin is a triterpenoid saponin found in the roots of the herb liquorice and has anti-inflammatory benefits and possible anti-cariogenic effect. The anti-inflammatory and antiallergic actions of the drug have been attributed to the corticosteroid-like activity of glycyrrhetic acid or enoxolone (Fig. 18) and glycyrrhizin (Fig.19) [WHO].

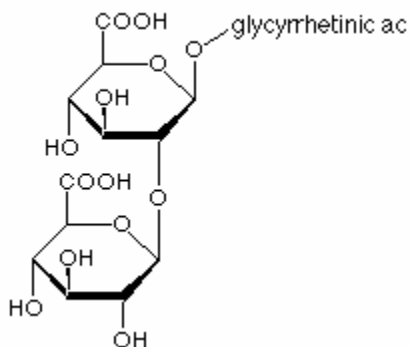


Fig. 19 glycyrrhizic acid

Comfrey (*Symphitum officinale*)

Comfrey's medieval reputation for knitting broken bones is reflected in its name of Knitbone, which comes from the Latin conferre, meaning to bring together [Back]. Comfrey is described as being a vulnerary and demulcent.

It used to be drunk for its short term use as a relatively safe, effective treatment for soothing inflamed mucous membranes, for example in bronchitis or gastric upsets. It is now banned for internal use.

The plant contains allantoin (0.6-0.8% but recently also found in the range 1.2-4.7%). Allantoin (Fig.20) acts as a vulnerary due to its cell proliferant effect. The demulcent action is due to the high mucilage content. Significant anti-inflammatory activity has been demonstrated *in vivo* [Bradley].

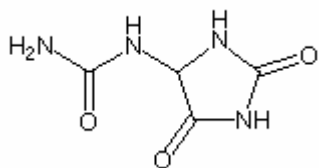


Fig.20 allantoin

In addition to allantoin the plant contains mucilage, tannins, starch, and two alkaloids, consolidine and symphytocynnglossine. Large amounts of potassium, phosphorus, and vitamins A and C are also present [Spoerke].

Aloe Vera (*Aloe barbadensis*)

Aloe is being drunk as a health drink, which is somewhat of a mystery, since it has never been taken internally traditionally. The dried *Aloe ferox* has been prescribed as a drastic purgative. The traditional use has always been for topical use and the proof of its effect is well documented.

The studies are numerous for the healing power of Aloe vera. A study described the healing of open pad wounds in dogs, the Aloe-treated wounds had a smaller unhealed area than did untreated control wounds and wounds treated with antibiotics [Swaim].

Aloe vera improves wound healing and inhibits inflammation. Since mannose-6-phosphate is the major sugar in the Aloe gel, the authors examined the possibility of its being an active growth substance. Mice receiving 300 mg/kg of mannose-6-phosphate had improved wound healing over saline controls. This dose also had anti-inflammatory activity. The function of mannose-6-phosphate in *A. vera* was discussed [Davis].

Full-face dermabrasion provided an ideal opportunity to document the effects of dressings on wound healing management. Following the procedure, the abraded face was divided in half. One side was treated with the standard polyethylene oxide gel wound dressings. The other side was treated with a polyethylene oxide gel dressing saturated with stabilized aloe vera. The polyethylene oxide dressing provided an excellent matrix for the release of aloe vera gel during the initial 5 days of wound healing. By 24-48 hours there was dramatic vasoconstriction and accompanying reduction in edema on the aloe-treated side. By the third to fourth day there was less exudate and crusting at the aloe site, and by the fifth to sixth day the re-epithelialization at the aloe site was complete. Overall, wound healing was approximately 72 hours faster at the aloe site. This acceleration in wound healing was important to reduce bacterial contamination, subsequent keloid formation, and/or pigmentary changes. The exact mechanism of acceleration of wound healing by aloe vera was unknown [Fulton].

The influence of Aloe vera, orally and topically, on wound healing was studied. Wounds were induced on both sides of the vertebral column of ICR mice using a biopsy punch. For the oral study, experimental animals received *A. vera* in their drinking water for 2 months, whereas the control animals received only water. In the topical study, experimental animals were given 25% *A. vera* in Eucerin cream topically. The control animals received cream only. A 62.5% reduction in wound diameter was noted in mice receiving 100 mg/kg/day oral *A. vera* and a 50.8% reduction was recorded in animals receiving topical 25% *A. vera*. These data suggest that *A. vera* is effective by both oral and topical routes of administration [Davis, 1989].

Eight topical agents in current use were studied for their effects on wound contraction and rate of reepithelialization of full-thickness excisions using a porcine animal model. The following agents were applied daily for a period of 27 days: scarlet red ointment, benzoyl peroxide lotion, bacitracin ointment, silver sulfadiazine cream, aloe vera gel, tretinoin cream, capsaicin cream, and mupirocin ointment. The rate of re-epithelialization was significantly enhanced by treatment with capsaicin, bacitracin, silver sulfadiazine, and scarlet red, and was markedly retarded by treatment with tretinoin. Wound contraction was significantly retarded by mupirocin, bacitracin, and silver sulfadiazine. Knowledge of the effects of topical agents on various aspects of healing allows the clinician to choose the most appropriate material to use in a given clinical situation to optimize the healing process and produce the best final result [Watcher].

Aloe vera at doses of 100 and 300 mg/kg daily for 4 days blocked the wound healing suppression of hydrocortisone acetate up to 100% using the wound tensile strength assay. This response was because of the growth factors present in A. vera masking the wound healing inhibitors such as sterols and certain amino acids. The sterols showed good anti-inflammatory activity (-36%) in reducing the croton oil-induced ear swelling. This activity displayed a dose-response relationship [Davis 1994, Davis 1987]. The use of aloe in treating leg ulcers has been described [Zawahry]. Kligman writes in his conclusions: *It is our opinion that the Aloe vera materials tested did not interfere with the normal rate of superficial dermal wound re-epithelialisation nor did they enhance the process any faster than the covered non-treated control wounds at the end of three weeks. It can be stated that the wounds treated with Aloe vera healed better than uncovered wounds and were more cosmetically gratifying* [Kligmann]. A review of the literature showed that the healing, soothing and cooling claims routinely made for Aloe were justified [Reynolds & Dweck]. Aloe vera also has a prophylactic effect in the protection of the skin against UV radiation [Strickland] and also protects the skin against the radiation produced in radiotherapy treatment [Sato; Iena; Lushbaugh].

Fixed Oils

Pomegranate (*Punica granatum*)

A number of oils are taken for their omega-3 or omega-6 content and these have good effect on the skin as protection for the skin's hydration. Examples include blackcurrant seed oil, evening primrose oil and borage oil.

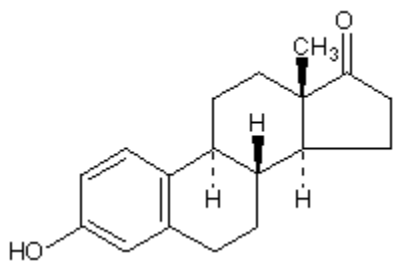


Fig. 21 Estrone

Pomegranate appears in one of the earliest medical papyri (the Ebers Papyrus) as a medicine of importance. The bark which was recommended by Dioscorides and Hippocrates as a vermifuge, is still regarded as one of the most useful remedies for tape worm; the rind is used for chronic dysentery [Leyel].

Pomegranate is one of the many plants that contain substances with hormone-type action. The seeds of Pomegranate, that ancient symbol of fertility, were found to contain an oestrone identical with the genuine hormone. *Punica granatum* seeds are the best source of plant estrone (Fig.21) to date [Weiss].

The leaf has antibacterial properties and is applied externally to sores [Stuart].

Foodstuffs

A number of foodstuffs are also the source for inspiration and new cosmetic raw materials

Apples (*Pyrus malus*) are being used for their seeds by a number of suppliers, for the treatment of wrinkles, cellulite and improvement in skin elasticity and appearance.

Dates (*Phoenix dactylifera*) have a good content of isoflavones and phyto-hormones which also have a direct and positive effect on the treatment of mature and wrinkled skin.

Sarsaparilla (*Smilax ornata*) taken internally for rheumatism and other elderly aches and pains is used externally for psoriasis, rheumatism and dry itching skin conditions like eczema. Its use in soft drinks is well known in America as root beer.

Oats (*Avena sativa*) are a well-known foodstuff as porridge and also in the preparation of cakes and breads. However, the use of oats for the treatment of pruritic skin conditions like eczema and other dry skin complaints has been known for generations.

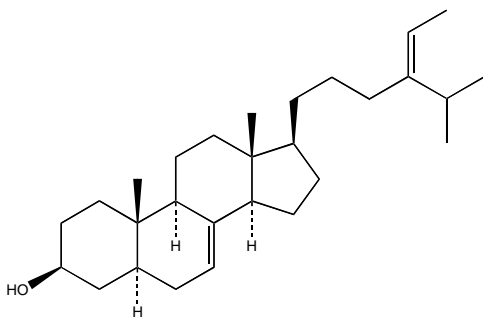


Fig. 22 Avenasterol

The presence of molecules like avenasterol (Fig. 22) and avenanthramide (Fig. 23) explain perfectly the anti-erythemic and anti-irritant effects of this mucilaginous material.

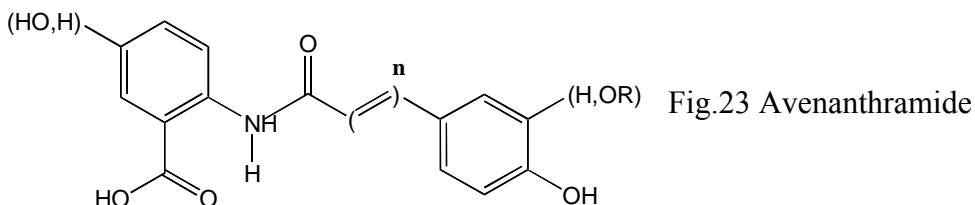


Fig.23 Avenanthramide

Oats are good for sores, inflammations and rough skin, they help to soften the skin (and to draw out splinters and foreign bodies). It is an exceptional healing poultice for the skin and will reduce the pain in an infected wound. It is also good for chapped hands and for healing skin eruptions [Buchmann].

A colloidal fraction extracted from avena has been used in the preparation of emollient dermatological preparations [Martindale].

Oat straw was once used, and possibly still is, to fill mattresses and palliasses, with great benefit to rheumatic conditions [Chiej].

Natural Preservatives

The paper will have a quick overview of natural preservatives which has been published elsewhere [Dweck, 2005]

Natural Colours

The paper will also look briefly at natural colours [Dweck, 2003] and has also published recently elsewhere.

Conclusions

The future is natural from every front. The influence of the dietary supplement market and the environmental or green issues will undoubtedly influence the market place for the next five years at least.

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