

The Wild Yam – a review

The Wild Yam – review of *Dioscorea* species.

Introduction

When it was decided to review the wild yam and related *Dioscorea* species it was probably in ignorance of the complexity of the task. This is a fascinating plant with many uses in folk lore and also in the history of the development of modern pharmacy. The number of species is quite overwhelming (over 600) and the ethnobotanical use most interesting.

Species and their names

The most well known species is *Dioscorea villosa*, also called Wild Yam Root, Colic Root and Rheumatism Root [British Herbal Pharmacopoeia]. In Chinese it is called Huang Yao Tzu, Shu Yu [Raintree]. Other sources refer to it as China Root, Devil's Bones, Yuma, Mexican Yams [Lust; Trickey], Wilde Yamwurzel [Grieve] and in the United States it is called the Atlantic Yam and Wild Gum Root [Krochmal *et al*]

Other species include: Amongst the medicinal yams, *Dioscorea villosa* and occasionally *hirticaulis* are mentioned in English pharmacopoeias [Fisher *et al.*]; *Dioscorea villosa*, *spiculiflora* and *floribunda* in the American [Willard]; *Dioscorea opposita* (*D. batatas*) or Chinese Yam, Shan Yao (mountain medicine) in Chinese [Reid; Chevalier], and *Dioscorea japonica* in Japanese [Yen] texts, although it is also known as Chinese Yam [Keys]. All of these *Dioscorea* spp. have similar indications, but those species used as part of Traditional Chinese Medicine have additional actions. *Dioscorea nipponica* and *D. caucasia* are not commonly used in Western herbal medicine.

Dioscorea transversa (*punctata*) is an Australian member of *Dioscorea* spp., which has been used topically for skin cancer. [Lassack *et al.*]

Dioscorea dregeana or “inGcolo” in Pondo and Xosa [Watt *et al*] seems to be the plant of choice in South Africa [Wyk *et al.*], while in tropical West Africa the plant of choice is *Dioscorea dumetorum* (Kunth) Pax. (Syn: *Helmia dumetorum*, *Dioscorea buchholziana* Engl.) or the Bitter Yam or Cluster Yam. [Oliver-Bever], this species is also used in Sekukuniland and known as “sekanama” by the Giftulp and Venda people [Watt *et al*]. Another species *Dioscorea sylvatica* or “inGweru” is also used by the Zulus and also rarely *Dioscorea rupicola* or “inKwa”. In Malawi, *Dioscorea bulbifera* L. - Air Potato or Potato yam (“Fikengere”) [Williamson]. This plant is also employed in the Philippines, where it is known as Aribukbuk; Bayag-Kabayo; Dadakan; Pulugan; Ubi-Ubihan; Utong-Utangan. [Quisumbing]

In the Philippines another species is also used *Dioscorea esculenta* (Lour.) Burkill or Tugi, Aneg; Boga; Dukai; Kamiging; Luttu; Tongo; Tungo. They also have *Dioscorea hispida* Dennst., or Nami, Bagai; Gagos; Kalut; Karat; Karoti; Kayos; Kalot; Korot, Kulot; Mamo; Nami; Orkot.

In the South American rainforests the *Dioscorea* aff. *belizensis* Lundell or Cocolmecca or Barba del Viejo is found [Arvigo *et al.*]. The Waimiri Atroari Indians of Brazil favoured *Dioscorea trifida* [Milliken *et al.*].

In India it is *Dioscorea pentaphyla* or Nureni-kelangu, Kanta-aloo that is employed [Drury] as well as *D. fasciculata* (Boxb.), which is cultivated largely in the vicinity of Calcutta, where it is known as the *soosni-aloo*. Another kind is the *D. purpurea* (Boxb.), known as the Pondicherry Sweet Potato.

Dioscorea deltoidea and *D. prazeri* are also used, which are known as Chingali Mangali, Ban Tarul, Kukkar Tarul in Hindi [Thakur]. Other exotic species like *D. floribunda* and *D. composita*, and their forms are being cultivated.

The uses of *Dioscorea villosa*

The original use of Wild Yam was as a source of the raw material used for contraceptive manufacture. Species of *Dioscorea* were also used as sources of saponins for the preparation of steroids in the pharmaceutical industry [Wren].

In herbal medicine the root is used for intestinal colic (and indigestion), to soothe diverticulitis, relieve dysmenorrhoea, as well as allay uterine and ovarine pain. The most significant use is in the treatment of rheumatoid arthritis to relieve the intense inflammation in the acute phase [British Herbal Pharm.]. It is also used for muscular rheumatism [Krochmal] and spasmodic asthma [Foster & Duke; Grieve], as well as things as remote as the “chronic gastritis of drunkards”!

Extracts of Wild Yam are also said to be of help to women with menopausal and PMS symptoms [Watson]. It is also said to be good for labour pains and the prevention of early miscarriage. The American Indians use a root decoction to relieve the pain of childbirth [Krochmal], other sources say that it is good for the nausea that can be experienced during pregnancy [Lust].

It is such a good antispasmodic that it can be used for cramps, coughs and hiccoughs [Trickey] and for muscular spasms, croup and gas. It is considered good for loosening phlegm, inducing vomiting and increasing urine flow.

Others say it is good for fatigue [Raintree] and is also soothing to the nerves [Lust]

There have been studies to show that *Dioscorea* has antioxidant activities [Araghiniknam *et al*] and the anti-inflammatory activity can be linked to the antiphlogistic effect of the steroidal saponins.

Some species of *Dioscorea* show antibacterial activity against Gram-positive bacteria and Gram-negative *Escherichia coli*, though specifically for *D. sylvatica* and *D. dregeana* [Kelmanson].

The plant is also cited with cardiovascular activity, hepatic effects and hormonal or oestrogenic effects.

“Widely prescribed cortisones and hydrocortisones were indirect products of the genus *Dioscorea*. They are used for Addison’s disease, some allergies, bursitis, contact dermatitis, psoriasis, rheumatoid arthritis, sciatica, brown recluse spider bites, insect stings, and other diseases and ailments.” [Foster & Duke]

Usage levels

Prepare a decoction with 3-9g of the root or use 10-30 drops of tincture [Watson].

By infusion or decoction 6 – 12g/day of the dry herb

The extract should be used at a level of between 20 – 40ml per week (1:2)

Liquid extract, dose 2 – 4ml [Wren]

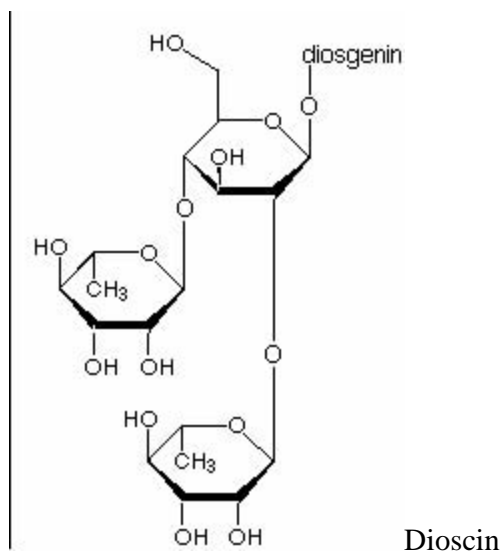
Infusion: Steep 1 tsp root in 1 cup water for 30 minutes. Take 1 cup in the course of the day, a mouthful at a time. [Lust]

Tincture: Take 10 to 30 drops in water, three or four times a day as needed. [Lust]

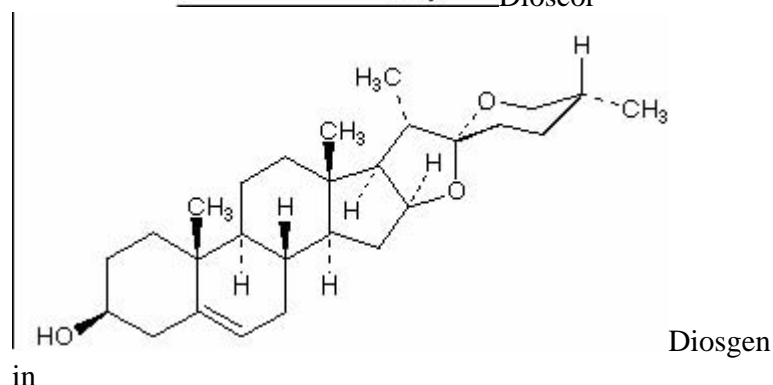
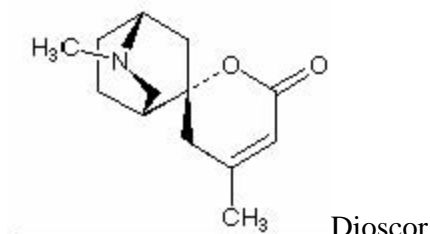
0.5 – 1 drachm of fluid extract. Dioscorein 0.25 to 4 grains. [Grieve]

Chemical composition

The wild growing Mexican Yams, *Dioscorea floribunda* and *D. composita* are believed to yield the most diosgenin and are used for commercial purposes.



The activity of *Dioscorea* species has been attributed to the action of various steroidal saponins (diosgenin an aglycone) and also to dioscorin(e), dioscin(e) and other alkaloids derived from nicotinic acid.



The root also contains phytoosterols, alkaloids, tannin and a high level of starch. Other materials include Aluminum, Ascorbic-acid, Ash, Beta-carotene, Calcium, Chromium, Cobalt, Iron, Magnesium, Manganese, Niacin, Phosphorus, Potassium, Protein, Riboflavin, Selenium, Silicon, Sodium, Thiamin, Tin, Zinc

Conclusions

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 that pharmaceutically active material and benefit the skin.

There is no doubt that the phytoosterols (of which diosgenin is a member) will give soothing and anti-inflammatory effect to the extract and so be a very useful topical additive to a skin cream for mature and dry skin types. This is being borne out in some of the latest studies being published on Wild Yam extracts targeted at the skin care formulator.

The ever ageing skin care market and the increasing proportion of consumers over 50 years of age will undoubtedly trigger a need for specific products to satisfy these more mature skin types. Wild yam, soy and pomegranate all contain diosgenin and so stand a good chance of being ideal for this market. A survey of the literature also highlighted ginseng as a potential source of this material, but the level was not specified.