Wild Carrot

Species (Family)

Daucus carota L. subsp. *carota* (Umbelliferae)

Synonym(s)

Daucus, Queen Anne's Lace

Part(s) Used

Herb

Pharmacopoeial and Other Monographs

BHC 1992[G6]
BHP 1996[G9]
Martindale 32nd edition[G43]
PDR for Herbal Medicines 2nd edition[G36]

Legal Category (Licensed Products)

GSL[G37]

Constituents[G6,G41,G64]

Documented constituents refer to the fruit or seeds obtained from the dried fruit unless stated.

Flavonoids Flavones (e.g. apigenin, chrysin, luteolin), flavonols (e.g. kaempferol, quercetin) and various glycosides.[1]

Furanocoumarin 8-Methoxypsoralen and 5-methoxypsoralen (0.01–0.02 µg/g fresh weight) in fresh plant. Concentrations increased in the diseased plant.[2]

Volatile oils 0.66–1.65%.[3] Many components identified; relative composition varies between different cultivars.[3] Various components include α-pinene, β-pinene, geraniol, geranyl acetate, limonene, α-terpinen, *p*-terpinen, α-terpineol, terpinen-4-ol, *p*-decanolactone (monoterpenes); β-bisabolene, β-elemene, caryophyllene, caryophyllene oxide, carotol, daucol (sesquiterpenes); asarone (phenylpropanoid derivative).[3]

Other constituents Choline,[4] daucine (alkaloid), a tertiary base (uncharacterised),[5] fatty acids (butyric, palmitic), coumarin, xylitol (polyol).

Food Use

Wild carrot should not be confused with the common cultivated carrot, *D. carota* L. subsp. *sativus* (Hoffm.), which has the familiar fleshy orange-red edible root. Wild carrot has an inedible tough whitish root.[G41] Wild carrot is listed by the Council of Europe as a natural source of food flavouring (category N1, N3). Category N1 indicates that for the roots there are no restrictions on use, whereas category N3 indicates that there is insufficient information available for an adequate assessment of potential toxicity.[G16]

Herbal Use

Wild carrot is stated to possess diuretic, antilithic, and carminative properties. Traditionally, it has been used for urinary calculus, lithuria, cystitis, gout, and specifically for urinary gravel or calculus.[G6,G7,G8,G64]

Dosage

Dried herb 2–4 g or by infusion three times daily.[G6,G7]

Liquid extract 2–4 mL (1 : 1 in 25% alcohol) three times daily.[G6,G7]

Pharmacological Actions

In vitro and animal studies

Significant antifertility activity (60%) in rats has been reported for wild carrot.[6] In contrast, insignificant antifertility activity was observed in pregnant rats fed oral doses of up to 4.5 g/kg body weight from day 1 to day 10 of pregnancy.[7] Aqueous, alcoholic and petrol extracts were reported to exhibit 20%, 40% and 10% activities respectively. Weak oestrogenic activity[6,8,9] and inhibition of implantation[6,9] has been documented for seed extracts.[8] Oestrogenic activity, demonstrated by the inhibition of ovarian hypertrophy in hemicastrated rats, has been attributed to the known constituent coumarin (a weak phytooestrogen).[10]

Central effects similar to those of barbiturates have been documented for the seed oil obtained from *D. carota* var.*sativa*.[11] The oil was reported to elicit CNS hypnotic effects in the rat, hypotension in the dog[4] leading to respiratory depression at higher

doses, anticonvulsant activity in the frog, *in vitro* smooth muscle relaxant activity reducing acetylcholine-induced contractions (ileum/uterus, rabbit/rat), antagonism of acetylcholine in isolated frog skeletal muscle, direct depressant effect on cardiac muscle in the dog.[4,11] *In vitro* cardiotonic activity[4] and vasodilation of coronary vessels of the isolated cat heart has been reported.[12] Papaverine-like antispasmodic activity has been documented for a tertiary base isolated from wild carrot seeds.[5] Activity of approximately one-tenth that of papaverine was noted in a number of isolated preparations: ileum, uterus, blood vessels and trachea.[5] Cholinergic-type actions have also been reported for wild carrot with *in vitro* spasmodic actions noted in both smooth and skeletal muscle.[4] This cholinergic activity has been attributed to choline.[13] The identity of a second quaternary base isolated was not established.

Terpinen-4-ol is a documented component of the seed oil. This constituent is considered to be the diuretic principle in juniper, exerting its effect by causing renal irritation (*see* Juniper).

Increased resistance to carbon tetrachloride-induced hepatotoxicity has been reported in rats fed wild carrot.[14]

Limited antifungal activity has been documented, with activity exhibited against only one (*Botrytis cinerea*) out of nine fungi tested.[15]

Agglutination of *Streptococcus mutans* cells has been described for wild carrot. The agglutinin, found to be heat and trypsin stable but sensitive to dextranose, was thought to be a dextran.[16]

Side-effects, Toxicity

The oil is reported to be non-toxic.[G41,G58] Acute LD_{50} values in mice (oral) and guinea-pigs (dermal) are reported to exceed 5 g/kg.[17]

The oil contains terpinen-4-ol, which is the component associated with the renal irritancy of juniper oil.

The oil is reported to be generally non-irritating and non-sensitising.[12] However, hypersensitivity reactions, occupational dermatitis and positive patch tests have been reported for wild carrot.[2,G51] Wild carrot is reported to have a slight photosensitising effect.[2] Furanocoumarins are known photosensitisers.

Contra-indications, Warnings

Fruit extracts may cause sensitivity reactions similar to those seen with celery.[2] Excessive doses of the oil may cause renal irritation in view of the terpinen-4-ol content (*see* Juniper). Excessive doses may affect existing hypo- and hypertensive, cardiac and hormone therapies.

Pregnancy and lactation The safety of wild carrot has not been established. Both spasmodic and spasmolytic actions on smooth muscle *in vitro* have been reported. In view of this, the documented mild oestrogenic activity and potentially irritant volatile oil, excessive doses of wild carrot during pregnancy and lactation should be avoided.

Pharmaceutical Comment

Phytochemical studies documented for wild carrot concentrate on the composition of the volatile oil obtained from both the fresh and dried fruits (seeds). The composition of the oil varies between different cultivars. Animal studies have documented a variety of pharmacological actions including CNS-depressant, spasmodic and antispasmodic, hypotensive and cardiac-depressant activities. However, the majority of these actions were observed in *in vitro* preparations. The principal traditional use of wild carrot is as a diuretic. This activity has not been documented in animal studies, but the seed oil of wild carrot does contain terpinen-4-ol, the diuretic principle documented for juniper. Toxicity data only refer to the oil and indicate low toxicity. However, in view of the documented mild oestrogenic activity and potential for internal irritation by the oil, excessive ingestion should be avoided.

References

See also General References G6, G9, G16, G31, G36, G37, G41, G43, G51, G58 and G64.

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2 Ceska O *et al.* Furocoumarins in the cultivated carrot, *Daucus carota*. *Phytochemistry* 1986; 25: 81–83.

3 Benecke R *et al.* Vergleichende Untersuchungen über den Gehalt an ätherischem Öl und dessen Zusammensetzung in den Früchten verschiedener Sorten von *Daucus carota* L. ssp. sativus (Hoffm.) Arcang. *Pharmazie* 1987; 42: 256–259.

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6 Prakash AO. Biological evaluation of some medicinal plant extracts for contraceptive efficacy. *Con-*

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7 Lal R *et al.* Antifertility effect of *Daucus carota* seeds in female albino rats. *Fitoterapia* 1986; 57: 243–246.
8 Kant A *et al.* The estrogenic efficacy of carrot (*Daucus carota*) seeds. *J Adv Zool* 1986; 7: 36–41.
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13 Gambhir SS *et al.* Studies on *Daucus carota*, Linn. Part II. Cholingergic activity of the quaternary base isolated from water-soluble fraction of alcoholic extracts of seeds. *Indian J Med Res* 1966; 54: 1053–1056.
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