

Parsley

Species (Family)

Petroselinum crispum (Mill.) Nyman (Apiaceae/
Umbelliferae)

Synonym(s)

Apium petroselinum L., *Carum petroselinum* (L.)
Benth., *Petroselinum sativum* Hoffm.

Part(s) Used

Leaf, root, seed

Pharmacopoeial and Other Monographs

BHC 1992^(G6)

BHP 1996^(G9)

Complete German Commission E^(G3)

Martindale 32nd edition^(G43)

PDR for Herbal Medicines 2nd edition^(G36)

Legal Category (Licensed Products)

GSL^(G37)

Constituents^(G2,G6,G22,G41,G48,G64,G58)

Flavonoids Glycosides of apigenin, luteolin (e.g. apiin, luteolin-7-apiosyl-glucoside, apigenin-7-glucoside (leaf only), luteolin-7-diglucoside (leaf only)).

Furanocoumarins Bergapten and oxypeucedanin as major constituents (up to 0.02% and 0.01% respectively); also 8-methoxypsoralen, imperatorin, isoperatorin, isopimpinellin, psoralen, xanthotoxin (up to 0.003%).⁽¹⁾

Volatile oils 2–7% in seed, 0.05% in leaf. The seed contains apiole, myristicin, tetramethoxyallylbenzene, various terpene aldehydes, ketones, and alcohols. The leaf contains myristicin (up to 85%), apiole, 1,3,8-*p*-menthatriene, 1-methyl-4-isopropenylbenzene, methyl disulfide, monoterpenes (e.g. α - and β -pinene, β -myrcene, β -ocimene, β -phellandrene, *p*-terpinene, α -terpineol), sesquiterpenes (e.g. α -copaene, carotol, caryophyllene).

Other constituents Fixed oil, oleo-resin, proteins, carbohydrates, and vitamins (especially vitamins A and C).

A detailed vitamin and mineral analysis is given elsewhere.^(G22)

Food Use

Parsley is listed by the Council of Europe as natural source of food flavouring (category N2). This category indicates that parsley can be added to foodstuffs in small quantities, with a possible limitation of an active principle (as yet unspecified) in the final product.^(G16) Parsley is commonly used in foods. In the USA, parsley is listed as GRAS (Generally Recognised As Safe).^(G65)

Herbal Use

Parsley is stated to possess carminative, antispasmodic, diuretic, emmenagogue, expectorant, antirheumatic and antimicrobial properties. Traditionally, it has been used for flatulent dyspepsia, colic, cystitis, dysuria, bronchitic cough in the elderly, dysmenorrhoea, functional amenorrhoea, myalgia and specifically for flatulent dyspepsia with intestinal colic.^(G2,G6,G7,G8,G64)

Dosage

Leaf/root 2–4 g or by infusion.

Seed 1–2 g.

Dried root 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

Parsley extract (0.25–1.0 mL/kg, by intravenous injection) has been reported to lower the blood pressure of cats by more than 40%,⁽²⁾ and to decrease both respiratory movements and blood pressure in anaesthetised dogs.⁽³⁾ Parsley exhibits a tonic effect on both intestinal and uterine muscle.⁽³⁾

This uterine effect has been attributed to the apiole content,^(G30) but has also been observed with apiole-free aqueous extracts.⁽³⁾ An aqueous extract of parsley has been documented to contain an antithiamine substance which was unaffected by cooking or contact with gastric juice.⁽³⁾ Myristicin and apiole are both effective insecticides.⁽⁴⁾

Parsley seed oil has been reported to stimulate hepatic regeneration.⁽⁵⁾

Clinical studies

Myristicin is the hallucinogenic principle present in nutmeg seed. It has been hypothesised that myristicin is converted in the body to amphetamine, to which it is structurally related.⁽⁴⁾ Myristicin has a structural similarity with sympathomimetic amines and it is thought that it may compete for monoamine oxidase enzymes, thereby exhibiting a monoamine oxidase inhibitor (MAOI)-like action.⁽⁶⁾ Parsley oil has been included in the diet of pregnant women and is reported to increase diuresis, and plasma protein and plasma calcium concentrations.⁽⁴⁾

The diuretic effect associated with the consumption of parsley is probably attributable to the pharmacological activities of myristicin (sympathomimetic action) and apiole (irritant effect).

Side-effects, Toxicity^(G58)

Chronic and excessive consumption of fresh parsley (170 g daily for 30 years) has been associated with generalised itching and pigmentation of the lower legs in a 70-year-old woman.⁽⁶⁾ The symptoms were attributed to excessive ingestion of parsley in the presence of chronic liver disease. The aetiology of the chronic hepatitis was unknown, but considered possibly related to the chronic exposure to the psoralen constituents in parsley.⁽⁶⁾ Apiole and myristicin are also documented to be hepatotoxic.

The ingestion of approximately 10 g apiole has been reported to cause acute haemolytic anaemia, thrombocytopenia purpura, nephrosis and hepatic dysfunction. However, ingestion of 10 g of apiole would require a dose of more than 200 g parsley. The amount of apiole ingested as a result of normal dietary consumption of parsley is not hazardous. Myristicin has been documented to cause giddiness, deafness, hypotension, decrease in pulse rate, and paralysis, followed by fatty degeneration of the liver and kidney.^(G22) In addition, myristicin is known to possess hallucinogenic properties. However, when compared to nutmeg, parsley contains a relatively low concentration of myristicin (less than 0.05% in parsley leaf, about 0.4–0.89% in nutmeg); parsley seed is potentially hazardous in view of its higher

volatile oil content (about 2–7%) which contains apiole and myristicin.

Parsley contains phototoxic furanocoumarins (*see Celery*). However, photodermatitis resulting from the oral ingestion of parsley is thought to be unlikely. The ingestion of 50 g parsley provides negligible amounts of bergapten (0.5–0.8 g).⁽⁷⁾ The concentration of oxypeucedanin provided was not mentioned. However, a photoactive reaction from topical contact with parsley is possible.

Apiole is an irritant component of the volatile oil and may cause irritation of the kidneys during excretion.

Parsley seed oil has been reported to stimulate hepatic regeneration.⁽⁴⁾ Myristicin and apiole are documented to have a similar chemical structure and acute toxicity to safrole, which is known to be carcinogenic and hepatotoxic (*see Sassafras*).⁽⁴⁾ The carcinogenic potential of apiole and myristicin has not been evaluated.⁽⁴⁾

LD₅₀ (mice, intravenous injection) values for apiole and myristicin have been documented as 50 mg/kg and 200 mg/kg body weight, respectively.⁽⁴⁾

Contra-indications, Warnings

Parsley should not be ingested in excessive amounts in view of the documented toxicities of apiole and myristicin. Parsley may cause a photoactive reaction, especially following external contact, may aggravate existing renal disease, and may potentiate existing MAOI therapy.

Pregnancy and lactation Parsley is reputed to affect the menstrual cycle.^(G7) Utero-activity has been documented in humans and animals,^(G30) and parsley is stated to be contra-indicated during pregnancy.^(G49,G58) Myristicin has been reported to cross the placenta and can lead to foetal tachycardia.⁽⁸⁾ In view of this, parsley should not be taken during pregnancy and lactation in doses that greatly exceed the amounts used in foods.

Pharmaceutical Comment

Parsley is commonly consumed as part of the diet. The pharmacological and toxicological properties of parsley are primarily associated with the volatile oil, particularly the apiole, myristicin and furanocoumarin constituents. Most of the reported uses of parsley are probably due to the volatile oil; no documented information was located regarding anti-rheumatic and antimicrobial properties. Parsley should not be consumed in doses that greatly exceed

the amounts used in foods, as excessive ingestion may result in apiole and myristicin toxicity.

References

See also General References G2, G3, G6, G9, G16, G22, G30, G31, G32, G36, G37, G41, G43, G48, G49, G58 and G64.

- 1 Chaudhary SK *et al.* Oxypeucedanin, a major furocoumarin in parsley, *Petroselinum crispum*. *Planta Med* 1986; 52: 462-464.
- 2 Petkov V. Plants with hypotensive, antiatheromatous and coronarodilatating action. *Am J Chin Med* 1979; 7: 197-236.
- 3 Opdyke DLJ. Parsley seed oil. *Food Cosmet Toxicol* 1975; 13(Suppl.): 897-898.
- 4 Buchanan RL. Toxicity of spices containing methylenedioxybenzene derivatives: A review. *J Food Safety* 1978; 1: 275-293.
- 5 Gershbein LL. Regeneration of rat liver in the presence of essential oils and their components. *Food Cosmet Toxicol* 1977; 15: 171-181.
- 6 Cootes P. Clinical curio: liver disease and parsley. *BMJ* 1982; 285: 1719.
- 7 Zaynoun S *et al.* The bergapten content of garden parsley and its significance in causing cutaneous photosensitization. *Clin Exp Dermatol* 1985; 10: 328-331.
- 8 Lavy G. Nutmeg intoxication in pregnancy. *J Reprod Med* 1987; 32: 63-64.

Parsley Piert

Species (Family)

Aphanes arvensis L. (Rosaceae)

Synonym(s)

Alchemilla arvensis Scop., *Aphanes*

Part(s) Used

Herb

Pharmacopoeial and Other Monographs

BHP 1983^(G7)
PDR for Herbal Medicines 2nd edition^(G36)

Legal Category (Licensed Products)

GSL^(G37)

Constituents^(G7,G34,G64)

Limited information is available. A related species *Alchemilla vulgaris* (lady's mantle) is reported to contain 6–8% tannins (hydrolysable-type);^(G41) none have been documented for parsley piert, although it is stated to contain an astringent principle.^(G6)

Food Use

Parsley piert is not used in foods.

Herbal Use

Parsley piert is stated to possess diuretic and demulcent properties, and to dissolve urinary deposits. Traditionally, it has been used for kidney and bladder calculi, dysuria, strangury, oedema of renal and hepatic origin, and specifically for renal calculus.^(G7,G64)

Dosage

Dried herb 2–4 g or by infusion three times daily.^(G7)

Liquid extract 2–4 mL (1:1 in 25% alcohol) three times daily.^(G7)

Tincture 2–10 mL (1:5 in 45% alcohol) three times daily.^(G7)

Pharmacological Actions

None documented.

Side-effects, Toxicity

None documented.

Contra-indications, Warnings

None documented.

Pregnancy and lactation In view of the lack of phytochemical, pharmacological, and toxicity information, the use of parsley piert during pregnancy and lactation should be avoided.

Pharmaceutical Comment

Little chemical information is available on parsley piert. No scientific evidence was found to justify the herbal uses. Parsley piert may exhibit astringent actions. In view of the lack of toxicity data, excessive use of parsley piert should be avoided.

References

See General References G7, G31, G34, G36, G37 and G64.