

Quassia

Species (Family)

- (i) *Picrasma excelsa* (Sw.) Planch. (Simaroubaceae)
- (ii) *Quassia amara* L.

Synonym(s)

- Bitterwood, *Picrasma*
- (i) Jamaican Quassia, *Picraena excelsa* Lindl.
- (ii) Surinam Quassia

Part(s) Used

Stem wood

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^(G2,G6,G22,G41,G64)

Alkaloids Indole-type. Canthin-6-one, 5-methoxy-canthin-6-one, 4-methoxy-5-hydroxycanthin-6-one, *N*-methoxy-1-vinyl- β -carboline.^(1,2)

Terpenoids Isoquassin (picrasmin) in *P. excelsa*, quassin 0.2%, quassinol, quassimarin,⁽³⁾ 18-hydroxyquassin, neoquassin, a dihydronorneoquassin⁽⁴⁾ and simalikalactone D in *Q. amara*.

Coumarins Scopoletin.⁽¹⁾

Other constituents β -Sitosterol, β -sitostenone; thiamine 1.8% (in *P. excelsa*).

Food Use

Quassia is listed by the Council of Europe as a natural source of food flavouring (category N2). This category indicates that quassia can be added to foodstuffs in small quantities, although the concentration of quassin must not exceed 5 mg/kg; a concentration of 50 mg/kg is permitted in alcoholic beverages and

10 mg/kg in pastilles and lozenges.^(G16) In the USA, quassia is regarded by the Food and Drugs Administration (FDA) as GRAS (Generally Regarded As Safe).

Herbal Use

Quassia is stated to possess bitter, orexigenic, sialogogue, gastric stimulant and anthelmintic properties. Traditionally, it has been used for anorexia, dyspepsia, nematode infestation (by oral or rectal administration), pediculosis (by topical application), and specifically for atonic dyspepsia with loss of appetite.^(G2,G6,G7,G8,G64)

Dosage

Dried wood 0.3–0.6 g or by cold infusion three times daily.^(G6,G7)

Concentrated Quassia Infusion (BPC 1959) 2–4 mL. Quassia Infusion is prepared by diluting one volume of Concentrated Quassia Infusion to eight volumes with water.

Tincture of Quassia (BP 1948) 2–4 mL.

Enema 150 mL per rectum (infusion with cold water, 1 in 20) on three successive mornings together with 16 g magnesium sulfate by mouth.

Pharmacological Actions

The quassinoids are reported to possess bitter properties 50 times greater than quinine.^(G22)

In vitro and animal studies

The β -carboline alkaloids have exhibited positive inotropic activity *in vitro*.⁽¹⁾ Canthin-6-one is reported to possess antibacterial and antifungal activity. Cytotoxic and amoebicidal activities (assessed against guinea-pig keratinocyte and *Entamoeba histolytica* test systems, respectively) have been documented for canthin-6-one and quassin (*P. excelsa*).⁽⁵⁾ However, later studies have disputed any amoebicidal action. Quassin is reported to be inactive against P388 leukaemia and 9KB test systems. Significant antitumour activity in mice against the P388 lymphatic leukaemia and *in vitro* against human

carcinoma of the nasopharynx (KB) has been documented.⁽³⁾ Quassamarin and simalikalactone were both isolated from the active extract.

Clinical studies

The successful treatment of 454 patients with headlice has been documented for quassia tincture.⁽⁶⁾ Quassia has been used as an enema to expel threadworms.^(G44)

Side-effects, Toxicity

No side-effects have been reported in 454 patients who used quassia tincture as a scalp lotion to treat headlice.⁽⁶⁾ Large doses of quassia may irritate the stomach and cause vomiting.^(G6)

Contra-indications, Warnings

Excessive doses may interfere with existing cardiac and anticoagulant therapies. However, the coumarin concentrations in quassia are not thought to pose a hazard. In addition, large doses of quassia are emetic and therefore excessive consumption is self-limiting.

Pregnancy and lactation In view of the reported cytotoxic and emetic activities, the use of quassia during pregnancy and lactation is best avoided.

Pharmaceutical Comment

The chemistry of quassia is well studied and is characterised by bitter terpenoids (quassinoids) and

β -carboline indole alkaloids. Limited data have been documented to justify the traditional herbal uses although the bitter principles support the use of quassia as an appetite stimulant in anorexia. However, in view of the documented cytotoxic activities and limited toxicological data, quassia in herbal remedies should not be taken in amounts greatly exceeding those used in foods.

References

See also General References G2, G6, G9, G12, G16, G22, G29, G36, G37, G41, G43, G56 and G64.

- 1 Wagner H *et al.* New constituents of *Picrasma excelsa*, I. *Planta Med* 1979; 36: 113–118.
- 2 Wagner H, Nestler T. N-Methoxy-1-vinyl- β -carboline, ein neues Alkaloid aus *Picrasma excelsa* (Swartz) Planchon. *Tetrahedron Lett* 1978; 31: 2777–2778.
- 3 Kupchan SM, Strelman DR. Quassamarin, a new antileukemic quassinoid from *Quassia amara*. *J Org Chem* 1976; 41: 3481–3482.
- 4 Grandolini G *et al.* A new neoquassin derivative from *Quassia amara*. *Phytochemistry* 1987; 26: 3085–3087.
- 5 Harris A, Phillipson JD. Cytotoxic and amoebicidal compounds from *Picrasma excelsa* (Jamaican Quassia). *J Pharm Pharmacol* 1982; 34: 43P.
- 6 Jensen O *et al.* Pediculosis capitis treated with quassia tincture. *Acta Dermat Venereol (Stockholm)* 1978; 58: 557–559.