Maté

Species (Family)

Ilex paraguariensis St. Hil. (Aquifoliaceae)

Synonym(s)

Ilex, Jesuit's Brazil Tea, Paraguay Tea, St. Bartholomew's Tea, Yerba Maté

Part(s) Used

Leaf

Pharmacopoeial and Other Monographs

BHP 1996[G9]
Complete German Commission E[G3]
PDR for Herbal Medicines 2nd edition[G36]

Legal Category (Licensed Products)

GSL[G37]

Constituents[G2,G22,G45,G48,G64]

Alkaloids Xanthine-type. Caffeine 0.2–2.0%, theobromine 0.1–0.2%, theophylline 0.05%.

Flavonoids Kaempferol, quercetin, and their glycosides, including rutin.[1]

Tannins 4–16%.

Terpenoids Ursolic acid (major), β-amyrin, ilexoside A, ilexoside B methyl ester.[2]

Other constituents Choline and trigonellin (amines), amino acids,[1] riboflavine (vitamin B_2), pyridoxine (vitamin B_6), niacin, pantothenic acid, vitamin C and resins.

Other Ilex species Triterpenoid saponins termed ilexsaponins B_1, B_2, and B_3 have been isolated from *Ilex pubescens* Hook. & Arn.[3]

A cyanogenetic glucoside has been isolated from *Ilex aquifolium*.[4]

Food Use

Maté is listed by the Council of Europe as a natural source of food flavouring (category N2). This category indicates that maté can be added to foodstuffs in small quantities, with a possible limitation of an active principle (as yet unspecified) in the final product.[G16] Maté is commonly consumed as a beverage. It is stated to be less astringent than tea.[G45] In the USA, maté is listed as GRAS (Generally Recognised As Safe).[G65]

Herbal Use

Maté is stated to possess CNS-stimulant, thymoleptic, diuretic, antirheumatic and mild analgesic properties. Traditionally, it has been used for psychogenic headache and fatigue, nervous depression, rheumatic pains, and specifically for headache associated with fatigue.[G2,G7,G8,G64]

Dosage

Dried leaf 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

In vivo hypotensive activity in rats has been reported for an aqueous extract of *Ilex pubescens* (commonly referred to as maodongqing or MDQ) It was concluded that intravenous administration of MDQ releases histamine.[5]

Clinical studies

The xanthine constituents, in particular caffeine, are the active principles in maté. The pharmacological actions of caffeine are well documented and include stimulation of the CNS, respiration and skeletal muscle, in addition to cardiac stimulation, coronary dilation, smooth muscle relaxation and diuresis.[G41] Reduction of appetite has been documented for maté.[1]

In China, MDQ is used parenterally for the treatment of cardiovascular diseases (hypotensive action).[1]

Side-effects, Toxicity

Side-effects generally associated with xanthine-containing beverages include sleeplessness, anxiety, tremor, palpitations and withdrawal headache.

Veno-occlusive disease of the liver in a young woman has been attributed to the consumption of large quantities of maté over a number of years.[G45] The association between consumption of maté infusions and oesophageal cancer has been investigated in Uruguay, where oesophageal cancer constitutes a major public health problem.[6,7] Heavy consumption was reported to elevate the relative risk of oesophageal cancer by 6.5 and 34.6 in men and women, respectively.

The fatal dose of caffeine in humans is stated to be 10 g.[G41]

Contra-indications, Warnings

Warnings generally associated with caffeine are applicable, such as restricted intake by individuals with hypertension or a cardiac disorder.

Pregnancy and lactation It is generally recommended that caffeine consumption should be restricted during pregnancy, although conflicting results have been documented concerning the association between birth defects and caffeine consumption. In view of this, excessive consumption of maté during pregnancy should be avoided. Caffeine is excreted in breast milk, but at concentrations too low to represent a hazard to breastfed infants.[G45] As with all xanthine-containing beverages, excessive consumption of maté by breastfeeding mothers should be avoided.

Pharmaceutical Comment

Maté is characterised by the xanthine constituents, which also represent the active principles. The herbal uses of maté can be attributed to the pharmacological actions of caffeine, which are well documented. Side-effects and warnings associated with other xanthine-containing beverages, such as tea and coffee, are applicable to maté.

References

See also General References G2, G3, G9, G10, G16, G22, G31, G36, G37, G41, G43, G48 and G64.

1 Ohem N, Holzl J. Some new investigations on *Ilex paraguariensis* – Flavonoids and triterpenes. *Planta Med* 1988; 54: 576.

2 Inada A. Two new triterpenoid glycosides from the leaves of *Ilex chinensis*. *Chem Pharm Bull* 1987; 37: 884–885.

3 Hidaka K *et al.* New triterpene saponins from *Ilex pubescens*. *Chem Pharm Bull* 1987; 35: 524–529.

4 Willems M. Quantification and distribution of a novel cyanogenic glycoside in *Ilex aquifolium*. *Planta Med* 1989; 55: 114.

5 Yang ML, Pang PKT. The vascular effects of *Ilex pubescens*. *Planta Med* 1986; 52: 262–265.

6 Morton JF. The potential carcinogenicity of herbal tea. *Environ Carcino Rev. J Environ Sci Health* 1986; C4: 203–223.

7 Vassallo A *et al.* Esophageal cancer in Uruguay : a case control study. *J Natl Cancer Inst* 1985; 75: 1005–1009.