

Hawthorn

Crataegus monogyna (Common Hawthorn) or *Crataegus laevigata* (Midland Hawthorn; *Crataegus oxyacantha*)

Also known as haw, thornapple, maythorn, whitethorn

PREPARATIONS: Berry preparations were most used traditionally, but extracts made from the dried leaves or leaves and flowers of *Crataegus laevigata* and *Crataegus monogyna*, now tend to predominate outside Asia. These are widely available as tablets, capsules, teas and tinctures, either as the only ingredient, or combined with a range of other herbs and/or nutraceutical ingredients. Products are marketed as medicines or dietary supplements mainly in Europe, North America, Australia and New Zealand. The fruits of other *Crataegus* species are used medicinally in other countries, particularly *Crataegus pinnatifida* in China.

ACTIVE CONSTITUENTS: Flavonoids, particularly the oligomeric proanthocyanidins (OPCs) including catechin, epicatechin, procyanidin B-2 and derivatives, are generally attributed as the most important constituents. Other flavonoids including rutin, hyperoside, vitexin and related compounds, and simple phenolic acids such as chorogenic, ursolic, oleanolic and caffeic acid, are also probably important. Tocopherols, vitamin C, and the amines phenylethylamine, tyramine and O-methoxyphenethylamine may also contribute. Mode(s) of action(s) are unknown, although may relate to antioxidant and inotropic activities.

MAIN USES: The use of hawthorn as a medicine dates back to Dioscorides, and Culpepper's sixteenth century herbal recommended it for kidney and bladder stones and dropsy. It was also used to treat fever, pleurisy, nervous tension, insomnia

Summary Message

Some evidence exists for hawthorn extracts having beneficial effects when taken concurrently with optimal medication for the treatment of mild chronic heart failure, although further long-term studies involving large numbers of patients are needed. Evidence is less convincing for its efficacy in hypertension, angina, coronary artery disease, arrhythmias and other cardiac conditions. As with all herbal medicines, different hawthorn products vary in their pharmaceutical quality, and the implications of this for dosage, efficacy and safety should be considered.

and depression. Towards the end of the nineteenth century the berries became increasingly used for the treatment of heart and circulatory problems. These included heart failure, angina pectoris, coronary artery disease, hypertension and cardiac arrhythmias.

In China, berries of other *Crataegus* species are traditionally used to improve digestion, menorrhagia and poor circulation, but interest in the effects on the cardiovascular system has also grown.

Most studies in recent years have focussed on hawthorn's apparent benefits as a treatment for chronic heart failure.

EVIDENCE FOR EFFICACY: A 2008 update of an earlier Cochrane systematic review, which appraised 10 trials involving 855 patients, concluded that hawthorn extract has significant

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benefits as an adjunctive treatment for patients with chronic heart failure.¹ Most of the trials concerned reported improvements in exercise tolerance, maximal workload, and symptoms such as shortness of breath and fatigue.

A more recent randomised, double-blind, placebo-controlled multicentre study involving 2681 patients who took 900 mg daily of a standardised hawthorn leaf and flower extract (equivalent to 3.6–5.9 g original dried herb) alongside their existing cardiac medications for 24 months, identified a trend for cardiac mortality reduction, but this failed to reach statistical significance. However, in the subgroup of patients with less compromised left ventricular function, a significant reduction in sudden cardiac death was measured.²

Another trial involving 900 mg per day of the same hawthorn preparation added to conventional heart failure therapy in a group of 120 patients with chronic heart failure for a six-month period, also failed to produce significant benefits, although a modest difference in left ventricular ejection fraction was measured.³ Limitations of this study include the small number of participants and relatively short duration of treatment. Also while most trials have used a daily hawthorn extract dosage of 900 mg, higher doses may be necessary.⁴

Chronic administration of a combined Chinese hawthorn fruit and kiwifruit preparation has shown hypolipidaemic effects in mice; similar effects have been reported for Chinese hawthorn in hamsters.

Hypotensive effects are often claimed for hawthorn. Clinical trial validation is, however, limited to a mild reduction in diastolic blood pressure reported in a randomised placebo controlled trial involving 79 type 2 diabetic patients, most of whom were taking concurrent hypotensive drug medication. Hypotensive effects have also been reported in a trial involving an Iranian species of hawthorn, *Crataegus curvisepala*.

Evidence of potential mild analgesic and anxiolytic effects has been documented. A trend towards reduced anxiety has also been observed in a pilot study with mildly hypertensive patients.

Hawthorn has been shown to prevent ischaemia-reperfusion injury in an in vivo rat model of acute myocardial infarction. A reduction in balloon catheter-induced neointima formation in rat carotid arteries, suggesting a potential to prevent coronary angioplasty-related restenosis was also recently reported.

ADVERSE EFFECTS: Data obtained from clinical trials to date seem to indicate that hawthorn is generally well tolerated, with reported adverse effects being infrequent, mild and transient. The most commonly reported adverse effects are nausea, dizziness, headache, migraine, palpitations and gastrointestinal complaints.

The frequency of adverse events was similar in both treatment and placebo groups, in a trial involving 2681 patients over a two-year period.²

DRUG INTERACTIONS: No significant adverse interactions have been reported, despite the fact that most trials involve the use of concomitant drugs prescribed for cardiac conditions. However, the possibility of herb–drug interactions between hawthorn and various drugs still exists, and, in theory, interactions may take place with antiarrhythmics, antihypertensives, digoxin and antihyperlipidaemic agents.

No influence of hawthorn on pharmacokinetic parameters of digoxin was found in a trial on healthy human volunteers. Hawthorn has, however, been found to interfere with a serum immunoassay for digoxin levels.

Key references

Full reference list available from the author on request: philrasm@ihug.co.nz

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