A number of species have been used as hawthorn for medicinal use, mostly *Crataegus monogyna* and *C. laevigata* (synonym *C. oxyacantha*) in the Western herbal tradition. *Crataegus* is in the rose family (Rosaceae).

**Traditional Use**

The traditional use of hawthorn berries is well known, less so the leaf and/or flower.

Since the 14th century, hawthorn flower has been described in herbal texts, but not with cardiac applications. Henri Leclerc in his *Précis de Phytothérapie* notes a 17th century reference that suggests a recommendation for use in high blood pressure: hawthorn relieves the cause of blood vessel distension and increased blood flow with high pulse rate. The plant part was undefined and there is much further discussion about clinicians who used hawthorn for their patients in the late 1800s and early 1900s, at least some of who were using berries, but at the end of his monograph he provides dosage information: "On peut prescrire l’aubépine sous forme d’infusion (1 cuillerée à café de fleurs pour 1 tasse d’eau bouillante, 2 ou 3 fois par jour), de poudre (2 à 5 g) ..." ["We can prescribe hawthorn in the form of infusion (1 teaspoon of flowers to 1 cup of boiling water, 2 or 3 times per day), powder (2 to 5 g) ..."].

Other traditional and/or folk use in Europe, probably dating from the early 20th century, of hawthorn includes:

- excitability in adults, such as palpitations in the absence of heart disease; neurotonic states in adults and children, especially minor sleep disorders (flower/flowering tops; France);
- to improve circulation (flower; southern Italy and Spain);
- insomnia (flower; northern Italy).

The Eclectics, a group of practitioners who were prominent around the late 19th and early 20th centuries in the United States used hawthorn leaf as a tonic.

**Clinical Studies**

**Constituents**

The main constituents of leaf and flower are flavonoids (particularly the flavone C-glycosides including vitexin-2'-rhamnoside), procyanidins (including oligomeric procyanidins), triterpenes, hydroxycinnamic acid derivatives, amines and polysaccharides. The flavone C-glycosides and oligomeric procyanidins (OPCs) are regarded as the active compounds. Over several decades, clinical studies have used extracts with claimed levels of these flavonoids and OPCs, but there is doubt that the OPCs levels were accurate. Analysis to determine the quantity of procyanidins that use (older) colourimetric methods will at best indicate the content but give no information about the procyanidin profile (oligomeric/polymeric procyanidins). (OPCs consist of 2 to 6 units of epicatechin/catechin units; polymeric procyanidins are larger, with a greater number of units.) To date, chromatographic determination, such as with the use of HPLC, has also had problems. Given the recently identified questions concerning the accuracy of OPC quantification methods, and this relates to procyanidins generally, not just in relation to those in hawthorn, the OPC dosage is not outlined in the following clinical data.

**Heart Failure**

The clinical efficacy of concentrated, standardised extracts of hawthorn leaf and flower in the treatment chronic heart failure is well established – a 2008 meta-analysis illustrates this. Of the randomised, double-blind, placebo-controlled trials reviewed, 14 met the inclusion criteria and 10 trials were suitable for meta-analysis. In most of the studies, hawthorn was used as an adjunct to conventional drug treatment. In all trials, adult patients were diagnosed with chronic heart failure and categorised according to the New York Heart Association (NYHA) classification (classes I to III – as the class increases, physical activity is increasingly limited). Length of the treatment ranged from 3 to 16 weeks. A summary of the major results is outlined in Table 1. To be included, studies were required to have used hawthorn leaf and flower extract, however, closer scrutiny of the primary references indicates that several of the trials did not administer extracts containing only leaf.
and flower – on the basis of their trade names, they contained berry with flower and/or leaf.\textsuperscript{11,12}

Of the eight trials with results outlined in Table 1, four trials with verified product contents, prescribed a daily dosage of extract equivalent to about 0.8-9.5 g of dried leaf and flower (and standardised for OPC content). Another commonly available extract was used, it was standardised for flavonoids.

A double-blind trial found that hawthorn leaf and flower extract taken for 6 months significantly decreased plasma levels of neutrophil elastase (which is important in the development and progression of atherosclerosis) compared to placebo, in diabetics with chronic coronary heart disease. In addition, treatment with hawthorn resulted in a trend towards significantly lower LDL-cholesterol levels. Patients remained on their conventional medications. The daily dose of extract provided 26.4 mg of flavonoids, of which 17 mg was vitexin-2-rhamnoside. It was also standardised for OPCs.\textsuperscript{21}

Safety

The 2008 meta-analysis found that adverse effects from hawthorn were infrequent, mild and transient. Five trials reported no adverse events in those receiving hawthorn extract.\textsuperscript{19} Other reviews note that hawthorn is well tolerated overall and rarely associated with serious
adverse effects, with vertigo and dizziness the most common adverse effects observed.\textsuperscript{22,23} Although adverse effects are not generally anticipated (as evidenced from the trials of conventional drug-medicated heart failure patients), modification of dosages may be required in patients taking cardioactive and hypotensive drugs.\textsuperscript{3,24}

A randomised, cross-over trial verified that standardised extract of hawthorn leaf and flower did not demonstrate an antiplatelet effect in healthy volunteers. The effect of 15-days intake of hawthorn was compared to that of aspirin, separated by a washout period of 2 weeks. The daily dose of hawthorn extract provided 50 mg of flavonoids. It was also standardised for OPCs.\textsuperscript{25}

### Actions
Heart tonic, possibly antithrombotic.

### Indications
- Cardiovascular and circulatory diseases.
- May provide support for insomnia and nervous conditions.

### REFERENCES

5. Pieroni A, Quave CL. J Ethnopharmacol 2005; 101: 258

Author: Michelle Morgan
© Copyright 2015 MediHerb.