**HERBClip**

**FILE:** Hawthorn (*Crataegus* spp.)
- Cardioactive glycosides
- Cardiac therapy
- Cardiotonics
- Heart disease

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**RE:** Benefits of Hawthorn in Heart Disease


This review article describes the cardioactive effects of standardized hawthorn (*Crataegus* spp.) extracts when compared with those of several other cardioactive agents, including adrenaline, amrinone, milrinone, and digoxin. Cardioactive agents such as the ones studied were defined as a collective group of drugs that act on the myocardium, heart rhythm, and coronary vessels. The article emphasizes that phytopharmaceuticals can be considered only for the treatment of chronic, not acute, heart failure, with heart failure being described as the inadequate supply of oxygen and nutrients to the body’s periphery as the result of heart disease.

The author characterizes the primary aim of treatment, identifies characteristics of an optimum drug for the treatment of chronic heart failure, and describes the two groups of cardioactive phytopharma-ceuticals worthy of consideration in terms of pharmacodynamically relevant constituents, pharmacological profile of action, and clinical efficacy. The first group of cardioactive agents includes extracts that contain cardiac glycosides, while the second group is that comprised of extracts of hawthorn leaves and flowers.

A brief review of plant extracts containing cardiac glycosides preceded a lengthier description of the properties of hawthorn extracts. Cardiac glycosides are found in the pure glycosides digoxin and digitoxin, as well as from *Adonis vernalis*, *Convallaria majalis*, Oleander leaves (*Nerium oleander*), and squill bulb (*Urginea maritima*). The individual crude drugs have not been adequately investigated from a pharmacological standpoint, but it is known that plant extracts containing a combination of the four plant cardiac glycosides act in a qualitatively similar manner to the pure glycosides. All bind to the same identifiable glycoside receptor. The bioavailability of pure glycosides is noticeably superior to that of plant
glycosides. Because of the narrow therapeutic index of cardiac glycosides, the author states that only defined herbal extracts of phytopharmaceutical declared constituents, adequate bioavailability and known onset, duration of action, daily loss of activity, and elimination should be used. In addition, methods for therapeutic monitoring of and detecting toxic concentrations in the plasma should be available.

Both older and more recent experimental and clinical investigations concerning two hawthorn extracts have been undertaken. These investigations have studied the use of the extracts in isolated heart muscle cells, on perfused guinea-pig hearts, in vivo in rats after a period of brief ischemia, and in clinical studies in patients with chronic heart failure. While the mechanism of hawthorn’s action remains unclear, from both in vitro and in vivo investigations at present the pharmacodynamic profile of action of standardized Crataegus extracts can be summarized in the following manner: a dose-dependent increase in force of cardiac contraction; largely neutral effects on the spontaneous rate with respect to potency and maximum effect; a shortening of the AV-conduction time in contrast to an increase following digitoxin administration; prolongation of effective refractory period that is dose-dependent and in contrast to the effects of adrenaline, digoxin, milrinone, and amrinone; an increase in coronary flow in contrast to the dose-dependent flow-reducing effect of digoxin; and cardioprotective effect on the ischemia model. Several tables are included and cover important pharmacokinetic parameters of digitalis and herbal cardiac glycosides, effects of various inotropic agents on cardiac functions, and testing criteria in chronic heart failure.

According to the German Commission E monograph, standardized extracts of hawthorn leaf with flower contain 2.2% flavonoids or 18.75% oligomeric procyanidins. Because of the absence of long-term studies, these extracts do not yet fulfill the therapeutic criterion for prolonging survival time. However, they do produce improvements in primary indicators such as subjective symptoms, exercise capacity, anaerobic threshold and ejection fraction. Positive therapeutic effects using an extract with 2.2% flavonoids have been observed on secondary symptoms, including threshold hypertension, tachycardia, and arrhythmia in stage II NYHA heart failure. Hawthorn extracts are characterized as being well-tolerated, showing no interactions with other drugs, and having a wide therapeutic index. —Anne Tarleton, PhD

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