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Crataegus oxyacantha: A homoeopathic remedy

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Abstract
Crataegus oxyacantha (Hawthorn) is a widely used Chinese herb for treatment of gastrointestinal ailments and heart problems and consumed as food. In North America, the role of treatment for heart problems dates back to 1800. Currently, evidence is accumulating from various *in vivo* and *in vitro* studies that hawthorn extracts exert a wide range of cardiovascular pharmacological properties, including antioxidant activity, positive inotropic effect, anti-inflammatory effect, anti cardiac remodelling effect, anti platelet aggregation effect, vaso dilating effect, endothelial protective effect, reduction of smooth muscle cell migration and proliferation, protective effect against ischemia/reperfusion injury, anti arrhythmic effect, lipid lowering effect and decrease of arterial blood pressure effect.

Keywords: *Crataegus oxyacantha*, cardiac vascular system, diseases

Introduction
Hawthorn, Crataegus oxyacantha (Rosaceae), is a perennial plant, usually a shrub or tree 1 to 6 m in height, and is found in deciduous forests and underbrush in the regions of Southeast Serbia. It grows in moderate, continental climate in the northern hemisphere. Hawthorn is well known in phytotherapy for the treatment of many cardiovascular diseases; it regulates blood pressure, increases the strength of heart muscle, and is used against arteriosclerosis and angina pectoris. Besides, hawthorn has a soothing effect on the nervous system, and is also used as a mild diuretic [1]. The recommended daily dosage of hawthorn is 160 - 900 mg of standardized extract, which corresponds to 3.5 - 19.8 mg of flavonoid. The daily dosage is divided into 2-3 individual doses and administered for at least 6 weeks [2, 3]. Reference data show that hawthorn leaves and flowers contain flavonoids (0.1-2 %, including rutin, hyperoside, vitexin, vitexin-2-O-rhamnoside, and acetylvitexin-2-O-rhamnoside), and oligomeric proanthocyanidins (composed of chains of flavan-3-ol units, 1-3 %), phenolic acids (including chlorogenic and caffeic acids), triterpene acids (oleanolic and ursolic acids), organic acids and sterols [4].

Natural products have been of great importance in disease treatment since ancient times. In fact, in traditional medicine, medicinal plants and herbal formulations play a crucial role in the prevention and mitigation of different human diseases. During the past two decades, herbal medicines have received considerable attention as novel therapeutic options for human disease treatment [5-9]. It is widely accepted that the presence of different bioactive compounds is responsible for the pharmacological effects of medicinal plants, among which edible plants are the most promising, due to their negligible adverse effects [10-12]. Crude extracts of hawthorn (Crataegus oxyacantha) have been used as a curative agent for cardiac disease, hypertension, and morbid conditions of the chest since the middle Ages. The claims of the few who advocate the use of crataegus in such conditions have never been satisfactorily tested. The drug was introduced to medicine in Britain about 1880 by Green, a non-registered practitioner in Ireland. Subsequently it was adopted by the homoeopathic school and incorporated in their authoritative works [12]. In America, Jennings [14] advocated the use of tincture of crataegus as an adjuvant to and even a substitute for digitalis in the treatment of cardiac disease, while Reilly [15] recommended its use in cases of cardiac failure with arteriosclerosis and high blood pressure. In France it has long had a certain vogue, and Huchard [16] etc., recommend the use of five minims of the tincture of hawthorn twice daily in order to keep the blood pressure of cases of hypertension within reasonable bounds. Hawthorn supplements are typically extracts from the berries and flowers of the common hawthorn plant used to treat a number of maladies, including various cardiovascular disorders [17, 18]. *In vitro* studies show hawthorn to promote the antioxidant enzyme activity of glutathione peroxidase, superoxide dismutase, and catalase [19],

promote nitric oxide mediated vaso dilation [20], and induce positive inotropic effects through Na+/K+-ATP stimulation and increased intracellular calcium concentrations [21, 22]. Although these positive inotropic effects have resulted in improved maximal workload and the pressure heart rate produce in meta analysis of human heart failure studies, larger outcome based trials have not yielded clinical benefits [23]. Hawthorn is also thought to have an effect on electrophysiologic properties similar to Class III antiarrhythmic agents, blocking potassium channels and prolonging action potential duration [24].

Pharmacy

A large volume of the tincture of Crataegus oxyacantha was made by macerating two kilogram's of dry powdered whole fruits of hawthorn with 5 litres of 70 per cent. alcohol for seven days, with occasional stirrings, filtering, pressing the marc, and mixing the fluids. This was assayed against international standard in 1926 tincture of digitalis prepared from samples of leaf provided by the National Institute for Medical Research, Hampstead. Biological assay was carried out by the frog and the cat methods on tincture of crataegus from which the alcohol had been removed by maintaining a temperature of 50° C. until the volume was reduced to 20 per cent. of the original volume. The average result of these investigations was that tincture of crataegus has a potency of 14.5 per cent. of standard in 1926 tincture of digitalis.

Pharmacology

A series of investigations into the pharmacology of Crataegus oxyacantha was undertaken; they may be summarized as follows: Tincture of crataegus causes sterile abscesses in guineapigs into which it is injected subcutaneously. Intravenous infusion of dilutions of the tincture from which the alcohol has been removed increases the gastric motility in anaesthetized guinea pigs. The motor gradient of the isolated bowel of rabbits is reversed. In mammals intravenous infusion of similar dilutions of the tincture leads to slowing of the heartbeat, prolongation of the diastole with a tendency to idioventricular rhythm, and heart block. The vagal centre in the medulla is stimulated, the early effects on the heart being inhibited by atropine. The isolated mammalian heart exhibits interference with the conducting system, while the avian heart reacts in a similar way to the mammalian heart. The coronary arteries of the sheep and rabbit and the pulmonary arteries and bronchi in the guinea-pig are constricted by crataegus. The carotid blood pressure of cats anaesthetized with 0.5 grain of nembutal per kilogramme of weight is profoundly depressed by 0.5 c.cm. of non alcoholic tincture of crataegus per kilogramme of weight. This effect is unaltered by atropinisation of the animal, and agrees with the findings of Martini in 1932 on the blood pressure of dogs. Subcutaneous injection of tincture of crataegus has an anti diuretic effect on rats. The tincture is toxic to the liver of mammals if repeatedly administered subcutaneously, but does not induce morphological changes in the heart. It is interesting to note the considerable similarities between the actions of tincture of crataegus and tincture of digitalis.

(A) Flower in stage (B) Fruiting stage

(C) Mature Fruit Stage (D) seeds of *Crataegus oxyacantha*

Fig 1: Different stages of *Crataegus oxyacantha*

Pharmacological activity

Hyperlipidemia

Although the lipid-lowering property of the hawthorn extract has been shown in a number of animal studies by means of reducing in total cholesterol, low density lipoprotein, and ApoB synthesis, there are still few well designed clinical trials. One study included 49 diabetic subjects with chronic CHD who were randomly assigned to either amicronized flower and leaf preparation of *C. Laevigata* group or a matching placebo. The main results were that *C. laevigata* decreased NE and showed a trend to lower LDLC compared to placebo as add-on treatment for diabetic subjects with chronic CHD [25]. Two Chinese clinical trials used Shan Zha Jingjiangzhi pill as therapy drugs compared with Duoxokang pill and placebo, separately. Results showed that, compared with Duoxikangpill, Shanzha Jingjiangzhipill can lower TG and TC [26]. While compared with placebo, more benefits about decreasing TC, TG, and LP(a) and increasing HDL-C were attained from Shanzha Jingjiangzhi pill [27].

Anti-platelet aggregation effect

Crataegus extract had effective anti-platelet activity at low doses of 100, 200, and 500mg/kg as indicated by the increase in bleeding time, decrease in platelet aggregation as assessed by PFA-100, and reduction in serum levels of thromboxane B2 [28-31].

Protective effect against ischemia/reperfusion injury

Hawthorn extract WS 1442 significantly reduced the deterioration of contractile function and infarct size in rat myocardium exposed to prolonged ischemia and reperfusion [32, 33]. Besides, it showed evident effect against reperfusion arrhythmias by reducing the average prevalence of malignant arrhythmias (VF + Flutter) and the average prevalence of ventricular tachycardia (VT) [34]. Moreover, it prevented the isoproterenol induced decrease in antioxidant enzyme activity [35].

Conclusion

In North America, however, natural health products (NHPs) are considered as food and dietary supplements and are therefore sold in health food stores [36]. In North America, and Canada in particular, natural health products are considered mainly used in the treatment of heart treated problems [37]. Currently, *Crataegus* products are currently marketed as an alternative treatment for hypertension, angina, the early stages of congestive heart failure by regulating whole body on multilevel and multi targets. Nowadays, with the population of NHPs, finding the high efficiency and fewer adverse effects of cardio vascular protective drugs from Chinese herb and formulas attracts great attention of researchers, and the study of target or mechanism of Chinese herb and formulas for hypertension is to be the hot topic of research and development of antihypertensive drugs. But there are still some problems we need to arise. On current, animal research of *Crataegus* on vaso dilating effect and lipid lowering effect were performed more frequently than those other effect of studies.

In addition, there are so many active ingredients in *Crataegus*, so that large quantity of active ingredients should be identified, extracted, and purified from the herb. What is more, some active ingredients are chemically unstable, which have limited the large scale synthesis. All these pressing issues should be resolved in future researches.

References

1. Zargari A. Medical Plants, Tehran University, Tehran. 1994; 1:91-102.
2. Commission Monograph E. Crataegi folium cum flore. Bundesanzeiger. 1994; 133:7-19.
3. WHO. Monographs on selected medicinal plants. Folium cum Flore Crataegi; World Health Organization (WHO): Geneva, Switzerland, edn 2, 2002, 66.
4. Hawthorn berries. Crataegi fructus. In European Pharmacopoeia 5.0, 5th ed.; Council of Europe: Strasbourg, France. 2004; 2:1712.
5. Nabavi SF, Nabavi SM, Moghaddam AH, Naqinezhad A, Bigdellou R, Mohammadzadeh S. Protective effects of Allium paradoxum against gentamicin induced nephrotoxicity in mice. Food Funct. 2012; 3:28-29.
6. Nabavi SF, Nabavi SM, Ebrahimzadeh MA, Jafari N, Yazdanpanah S. Biological Activities of Freshwater Algae, Spirogyra singularis Nordstedt. J Aquat. Food Prod. Technol. 2013; 22:58-65.
7. Nabavi SF, Nabavi SM, Setzer W, Nabavi SA, Ebrahimzadeh MA. Antioxidant and antihemolytic activity of lipid soluble bioactive substances in avocado fruits. Fruits. 2013; 68:185-193.
8. Nabavi SM, Marchese A, Izadi M, Curti V, Daglia M, Nabavi SF. Plants belonging to the genus Thymus as antibacterial agents: From farm to pharmacy. Food Chem. 2015; 173:339-347.
9. Nabavi SF, Russo GL, Daglia M, Nabavi SM. Role of quercetin as an alternative for obesity treatment: You are what you eat! Food Chem. 2015, 179:305-310.
10. Curti V, Capelli E, Boschi F, Nabavi SF, Bongiorno AI, Habtemariam S *et al*. Modulation of human miR-17–3p expression by methyl 3-O-methyl gallate as explanation of its *in vivo* protective activities. Mol. Nutr. Food Res. 2014; 58:1776-1784.
11. Nabavi SM, Habtemariam S, Nabavi SF, Sureda A, Daglia M, Moghaddam AH *et al*. Protective effect of gallic acid isolated from Peltiphyllum peltatum against sodium fluoride induced oxidative stress in rat's kidney. Mol. Cell. Biochem. 2013; 372:233-239.
12. Nabavi SM, Nabavi SF, Eslami S, Moghaddam AH. *In vivo* protective effects of quercetin against sodium fluoride induced oxidative stress in the hepatic tissue. Food Chem. 2012; 132:931-935.
13. Assmann. Dtsch.2. Homoeopathy. 1930; 10:72.
14. Jennings JNY. Medical Journal. 1906; 27:743.
15. Reily TF. Journal of America medical association. 1910; 54:103.
16. Huchard J. Rev. Gen chim therapy. 1930; 3:103.
17. Chang Q, Zuo Z, Harrison F, Chow MSS. Hawthorn. The Journal of Clinical Pharmacology. 42(6):605-612.
18. Rigelsky JM, Sweet BV. Hawthorn: Pharmacology and therapeutic uses. American Journal of Health-System Pharmacy. 2002; 59(5):417-422.
19. Jayalakshmi R, Niranjali Devaraj S. Cardioprotective effect of tincture of *Crataegus* on isoproterenol-induced myocardial infarction in rats. The Journal of Pharmacy and Pharmacology. 2004; 56(7):921-926.
20. Li C, Wang M-H. Anti-inflammatory effect of the water fraction from hawthorn fruit on LPS-stimulated RAW

264.7 cells. Nutrition Research and Practice. 2011; 5(2):101-106.
21. Rodriguez ME, Poindexter BJ, Bick RJ, Dasgupta A. A comparison of the effects of commercially available hawthorn preparations on calcium transients of isolated cardiomyocytes. Journal of Medicinal Food. 2008; 11(4):680-686.
22. Pittler MH, Schmidt K, Ernst E. Hawthorn extract for treating chronic heart failure: Meta-analysis of randomized trials. American Journal of Medicine. 2003; 114(8):665-674.
23. Zick SM, Vautaw BM, Gillespie B, Aaronson KD. Hawthorn extract randomized blinded chronic heart failure (HERB CHF) trial. European Journal of Heart Failure. 2009; 11(10):990-999.
24. Al-Makdessi S, Sweidan H, Dietz K, Jacob R. Protective effect of *Crataegus oxyacantha* against reperfusion arrhythmias after global no-flow ischemia in the rat heart. Basic Research in Cardiology. 1999; 94(2):71-77.
25. Dalli E, Colomer E, Tormos MC *et al*. *Crataegus laevigata* decreases neutrophil elastase and has hypolipidemic effect: a randomized, double-blind, placebo-controlled trial, Phytomedicine. 2011; 18:769-775.
26. Liang YF, Ye H. Clinical effect of Shanzha Jing Jiangzhi Pill in the treatment of hyperlipidemia. Strait Pharmaceutical Journal. 2004; 16(2):93-94.
27. Shen QL, Lan LM, Li PY, Zhang CQ. Clinical value of the Shanzha Jing Jiangzhi Pill on lipoprotein (a) and the changes of nitric oxide of senile hyperlipidemia patients after intervention. Strait Pharmaceutical Journal. 2000; 12(3):85-86.
28. Mehta SR. Appropriate antiplatelet and antithrombotic therapy in patients with acute coronary syndromes: recent updates to the ACC/AHA guidelines. Journal of Invasive Cardiology. 2002; 14(1-2):27-34.
29. Dutta-Roy AK. Dietary components and human platelet activity, Platelets. 2002; 13(2):67-75.
30. Mayer TO, Biller J. Antiplatelet prescribing patterns for TIA and ischemic stroke: the Indiana University experience. Journal of the Neurological Sciences. 2003; 207(1-2):5-10.
31. Abdullah SS, Hesham S, Fahaid AH. Effect of hawthorn (*Crataegus aronia* syn. *Azarolus* (L)) on platelet function in albino Wistar rats, Thrombosis Research. 2012; 130(1):75-80.
32. Han J-Y, Fan J-Y, Horie Y *et al*. Ameliorating effects of compounds derived from Salvia miltiorrhiza root extract on microcirculatory disturbance and target organ injury by ischemia and reperfusion. Pharmacology and Therapeutics. 2008; 117(2):280-295.
33. Veveris M, Koch E, Chatterjee SS. *Crataegus* special extract WS 1442 improves cardiac function and reduces infarct size in a rat model of prolonged coronary ischemia and reperfusion, Life Sciences. 2004; 74(15):1945-1955.
34. AlMakdessi S, Sweidan H, Dietz K, Jacob R. Protective effect of *Crataegus oxyacantha* against reperfusion arrhythmias after global no flow ischemia in the rat heart, Basic Research in Cardiology. 1999; 94(2):71-77.
35. Jayalakshmi R, Devaraj SN. Cardioprotective effect of tincture of *Crataegus* on isoproterenol induced myocardial infarction in rats. Journal of Pharmacy and Pharmacology. 2004; 56(7):921-926.
36. Rates SMK. Plants as source of drugs, Toxicon. 2001; 39(5):603-613.
37. Basu SK, Thomas JE, Acharya SN. Prospects for growth in global nutraceutical and functional food markets: a Canadian perspective, Australian Journal of Basic and Applied Sciences. 2007; 27(4):637-649.