

Lipid Lowering Effect of Ethanolic Extract of *Carduus crispus* L. on Hypercholesterolemic Rats

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Abstract

The main purpose of this study was to determine possible effects of the ethanolic extract of aerial parts of *Carduus crispus* L. on the serum lipids in hypercholesterolemic rats. After oral administration for two weeks, *C. crispus* extract produced significant decrease on serum total cholesterol, low density lipoprotein cholesterol, triglyceride levels and atherogenic indices in hypercholesterolemic groups ($P < 0.05$). *C. crispus* extract had no effects on serum high density lipoprotein cholesterol levels in these groups. It is concluded that the extract of aerial parts of *C. crispus* exhibits lipid lowering activity in hypercholesterolemic rats.

Key words: *Carduus crispus*, lipoproteins, cholesterol, arteriosclerosis

Introduction

Cardiovascular diseases are one of the leading causes of death in the world. Increased plasma cholesterol is known to be a major risk related to the development of cardiovascular disease and arteriosclerosis. Atherosclerosis plays a major role in the development of myocardial infarction and stroke. High level of low density lipoprotein cholesterol (LDL-c) and low level of high density lipoprotein cholesterol (HDL-c) have been strongly associated with the risk of coronary artery disease or arteriosclerosis. Abnormally low level of HDL-c is associated with increased possibility of atherosclerosis, probably because of disrupted reverse cholesterol transport (Khoja & Marzouki, 1994; Koolman & Roehm, 2003). Simvastatin is a cholesterol-lowering drug of a group of drugs called 3-hydroxy-3-methylglutaryl coenzyme A (HMG CoA) reductase inhibitors. It lowers serum cholesterol levels by inhibiting hepatic cholesterol biosynthesis and thus up regulates hepatic LDL-c receptors, resulting in an increased uptake of LDL-c from the blood and the subsequent lowering of circulating cholesterol levels (Kolovou *et al.*, 2008).

Many herbal medicinal products have potential hypocholesterolemic activity and encouraging safety profiles, such as *Nigella sativa*, *Fetula*

assafoetida, *Aloe vera*, *Piper longum*, *Aconitum barbatum* and *Citrus unshiu* (Ross, 2005; Kim *et al.*, 2006; Jun *et al.*, 2009; Sukhdolgor *et al.*, 2009).

Carduus crispus L. is a plant species of the family *Asteraceae*, and it is used in Mongolian traditional medicine for the treatment of various diseases, such as stomachache, rheumatism, atherosclerosis, cancer and etc. (Zhang *et al.*, 2002; Ligaa *et al.*, 2005). In this work we report the results of study on the effect of aerial parts extract of *C. crispus* on serum lipids levels to evaluate hypolipidemic activity of the plant.

Material and Methods

This study was performed in 2009, in the Institute of Macromolecular Chemistry and Mongolian Medicine, Inner Mongolia University, Huhhot, China.

Aerial part of *C. crispus* and its full flowering stage were collected in July 2008 from Erdenesant district, Tuv province, Mongolia. A species was identified by Dr. Ch. Sanchir, Institute of Botany, Mongolian Academy of Sciences. Aerial part of the samples were separated, cleaned and dried in the open air. Air dried plant materials were roughly cut and ground to the powder. The plant material (50 g) was weighed and Soxhlet extracted with