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A survey of Chinese herbal ingredients with liver protection activities

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Chinese Medicine 2007, 2:5 doi:10.1186/1749-8546-2-5

Published: 10 May 2007

Abstract

A literature survey was conducted on herbs, their preparations and ingredients with reported liver protection activities, in which a total of 274 different species and hundreds of active ingredients have been examined. These ingredients can be roughly classified into two categories according to their activities: (1) the main ingredients, such as silybin, osthole, coumarin, glycyrrhizin, saikosaponin A, schisandrin A, flavonoids; and (2) supporting substances, such as sugars, amino acids, resins, tannins and volatile oil. Among them, some active ingredients have hepatoprotective activities (e.g. anti-inflammatory, anticancer, antioxidant, immunomodulating and liver cirrhosis-regulating effects). Calculation of physicochemical parameters indicates that the main ingredients with negative and positive E_{lum0} values possibly display their hepatoprotective effects through different mechanisms, such as antioxidative, anti-inflammatory and immunomodulating effects. As the combination of herbs may achieve some treatment effects synergistically and/or additively, it is common in Chinese medicine to use mixtures of various medicinal herbs with pharmacologically active compounds to have synergistic and/or additive effects, or to reduce harmful effects of some pharmacologically active compounds. In particular, the active compounds with Clog P around 2 are suitable for passive transport across membranes and accessible to the target sites. Thus, E_{lum0} and Clog P values are good indicators among the calculated parameters.

Seven different physicochemical parameters (MW, Clog P, CMR, μ , E_{homo} , E_{lum0} and H_f) and four major biological activities (antioxidant, anti-inflammatory, antiviral/antitumor and immunomodulating) are discussed in this review. It is hoped that the discussion may provide some leads in the development of new hepatoprotective drugs.