U.S. National Library of Medicine
National Center for Biotechnology Information

NLM Citation: LiverTox: Clinical and Research Information on Drug-Induced Liver Injury [Internet]. Bethesda (MD): National Institute of Diabetes and Digestive and Kidney Diseases; 2012-. Hops. [Updated 2018 Mar 30].
Bookshelf URL: https://www.ncbi.nlm.nih.gov/books/

Hops

Updated: March 30, 2018.

OVERVIEW

Introduction

Hop is an important agricultural plant that has been used to flavor beer for centuries and has been claimed to have sedative properties and to be useful for treatment of anxiety and insomnia. Hops have not been implicated in causing serum enzyme elevations or clinically apparent liver injury.

Background

Hop (Humulus lupulus) is a perennial plant that is used largely as a flavoring in the production of beer. The hop plant is cultivated as a vine that grows around a physical support and produces shoots, heart shaped dark green leaves, fresh cones and flowers that are borne on lateral branches. The cones and flowers are used to prepare hops which have a distinctive bitter taste, attributed to lupulin, an aromatic acid. Other components of hops include several flavonoids, phenolic acid, volatile oils, tannins and resins. Besides its wide use as a flavoring agent for food and beer, hops is used as an ingredient in many creams and lotions. Extracts of hops have been used in oral herbal medications predominantly as a sedative for anxiety, tension and difficulty sleeping. While widely used, it has not been proven to be effective either as a sedative or hypnotic. Hops is found in multiple over-the-counter herbal mixtures in combination with other agents such as chamomile, passion flower and valerian, used as sleeping aids or mild sedatives. Side effects are few, but may include drowsiness, dizziness and hypersensitivity reactions.

Hepatotoxicity

Despite, wide scale use, hops has not been convincingly linked to instances of clinically apparent liver injury.

Likelihood score: E (unlikely cause of clinically apparent liver injury).

Other Names: Asperge Sauvage, Couleuvree, Hopfenzapfen, Houblon, Lupulin, Pi Jiu Hua

Drug Class: Herbal and Dietary Supplements

See also Drug Class: Sedatives and Hypnotics, Herbals

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Box continues on next page...

Box continued from previous page.

Hops – Generic (OTC Products)

DRUG CLASS

Herbal and Dietary Supplements

Sedatives and Hypnotics

COMPLETE LABELING

Product labeling at DailyMed, National Library of Medicine, NIH

CHEMICAL FORMULA AND STRUCTURE

DRUG	CAS REGISTRY NUMBER	MOLECULAR FORMULA	STRUCTURE
Hops	0977070679	Unspecified	Add Structure

ANNOTATED BIBLIOGRAPHY

References updated: 30 March 2018

Zimmerman HJ. Unconventional drugs. Miscellaneous drugs and diagnostic chemicals. In, Zimmerman HJ. Hepatotoxicity: the adverse effects of drugs and other chemicals on the liver. 2nd ed. Philadelphia: Lippincott, 1999, pp. 731-4.

(Expert review of hepatotoxicity published in 1999; several herbals are discussed, including comfrey, Jin Bu huan, germander, chaparral leaf, skullcap and valerian, but not hops).

Seeff L, Stickel F, Navarro VJ. Hepatotoxicity of herbals and dietary supplements. In, Kaplowitz N, DeLeve LD, eds. Drug-induced liver disease. 3rd ed. Amsterdam: Elsevier, 2013, pp. 631-58.

(Review of hepatotoxicity of herbal and dietary supplements [HDS]; hops is not discussed).

Hops. In, PDR for Herbal Medicines. 4th ed. Montvale, New Jersey: Thomson Healthcare Inc., 2007: pp. 448-52.

(Compilation of short monographs on herbal medications and dietary supplements).

Lindahl O, Lindwall L. Double blind study of a valerian preparation. Pharmacol Biochem Behav 1989; 32: 1065-6. PubMed PMID: 2678162.

(Controlled trial of valerian with lemon balm and hops vs lemon balm and hops alone in 27 subjects with sleep difficulties found better sleep quality with valerian; "no side effects were reported").

Gyllenhaal C, Merritt SL, Peterson SD, Block KI, Gochenour T. Efficacy and safety of herbal stimulants and sedatives in sleep disorders. Sleep Med Rev 2000; 4: 229-51. PubMed PMID: 12531167.

(Review of herbals used for sleep disorders; mentions that animal studies suggest that hops has sedative effects, but there has been little clinical study of its efficacy in humans).

Morin CM, Koetter U, Bastien C, Ware JC, Wooten V. Valerian-hops combination and diphenhydramine for treating insomnia: a randomized placebo-controlled clinical trial. Sleep. 2005; 28: 1465-71. PubMed PMID: 16335333.

(Controlled trial of a valerian-hops combination vs diphenhydramine vs placebo in 184 patients with mild insomnia found a "modest hypnotic effect" for the herbal combination; there were no serious adverse events and side effects were similar between placebo and the herbals).

Wheatley D. Medicinal plants for insomnia: a review of their pharmacology, efficacy and tolerability. J Psychopharmacol 2005; 19: 414-21. PubMed PMID: 15982998.

(Review of herbals used to treat insomnia; the sedative effect of hops was suspected because of "Hop-picker fatigue", but a study in mice and a subsequent clinical trial in 15 humans found no evidence for sedative or sleep inducing effects).

Meolie AL, Rosen C, Kristo D, Kohrman M, Gooneratne N, Aguillard RN, Fayle R, et al.; Clinical Practice Review Committee; American Academy of Sleep Medicine. Oral nonprescription treatment for insomnia: an evaluation of products with limited evidence. J Clin Sleep Med 2005; 1: 173-87. PubMed PMID: 17561634.

(Systematic review of efficacy of nonprescription treatments for insomnia states that there is no scientific evidence in support of either safety or efficacy of hops in treatment of insomnia).

Salter S, Brownie S. Treating primary insomnia - the efficacy of valerian and hops. Aust Fam Physician 2010; 39: 433-7. PubMed PMID: 20628685.

(Systematic review of literature on efficacy of valerian and hops in treating insomnia; 9 studies of valerian alone and 3 of the combination of valerian and hops found some evidence of benefit of valerian, but the separate efficacy or role of hops could not be assessed; adverse events were not discussed).

Sarris J, Panossian A, Schweitzer I, Stough C, Scholey A. Herbal medicine for depression, anxiety and insomnia: a review of psychopharmacology and clinical evidence. Eur Neuropsychopharmacol 2011; 21: 841-60. PubMed PMID: 21601431.

(Systematic review and summary of clinical evidence of efficacy of herbals used to treat anxiety, depression and insomnia; mentions that hops has been studied in humans, but does not rank the herbal as having evidence for efficacy in insomnia in humans).

Drugs for insomnia. Treat Guidel Med Lett 2012; 10 (119): 57-60. PubMed PMID: 22777275.

(Guidelines for therapy of insomnia; mentions herbal products that are claimed to have sleep inducing effects including valerian root, kava, chamomile tea, passionflower, hops, lemon balm, lavender and skull cap, but that there is no convincing evidence for their efficacy and that the purity of commercially available over-the-counter products is suspect).

Bunchorntavakul C, Reddy KR. Review article: herbal and dietary supplement hepatotoxicity. Aliment Pharmacol Ther 2013; 37: 3-17. PubMed PMID: 23121117.

(Review of HDS associated hepatotoxicity; does not mention hops).

Navarro VJ, Barnhart H, Bonkovsky HL, Davern T, Fontana RJ, Grant L, Reddy KR, et al. Liver injury from herbals and dietary supplements in the U.S. Drug-Induced Liver Injury Network. Hepatology 2014; 60:1399-408. PubMed PMID: 25043597.

(Among 85 cases of HDS associated liver injury [not due to anabolic steroids] enrolled in a US prospective study between 2004 and 2013, none were attributed to hops).

Chalasani N, Bonkovsky HL, Fontana R, Lee W, Stolz A, Talwalkar J, Reddy KR, et al.; United States Drug Induced Liver Injury Network. Features and outcomes of 899 patients with drug-induced liver injury: The DILIN Prospective Study. Gastroenterology 2015; 148: 1340-52. PubMed PMID: 25754159.

(Among 899 cases of drug induced liver injury enrolled in a prospective database between 2004 and 2012, HDS were implicated in 145 [16%], none of which were due to hops: see Navarro [2014]).