

strong spasmolytic effects on isolated smooth muscle preparations; hypnotic and sedative effects (disputed by one report); estrogenic properties were not observed in a more recent study; and allergenic activity on humans, causing contact dermatitis due to the pollen. Extracts are used in skin creams and lotions, in Europe, for alleged skin-softening properties. Extracts and oil are used as flavoring in nonalcoholic beverages, frozen dairy desserts, candy, baked goods, gelatins, and puddings, with the highest average maximum use level of 0.072% reported for an extract used in baked goods.²⁹ Hops steeped in sherry makes an excellent stomachic cordial.² Recently, counterculture entrepreneurs have apparently succeeded in grafting hops tops on marijuana bottoms and getting a "heady hop". Conversely, they might have succeeded in getting a perennial marijuana by grafting the annual herb onto the perennial hop.

Dried strobili used medicinally as a bitter tonic, sedative, hypnotic. The decoction from the flower is said to remedy swellings and hardness of the uterus. A cataplasm of the leaf is said to remedy cold tumors. The dried fruit, used for poultices and fomentations, is said to remedy painful tumors. The pomade, made from the lupulin, is said to remedy cancerous ulcerations.⁴ Reported to be anaphrodisiac, anodyne, antiseptic, diuretic, hypnotic, nervine, sedative, soporific, stomachic, sudorific, tonic, and vermifuge, hops is a folk remedy for boils, bruises, calculus, cancer, cramps, cough, cystitis, debility, delirium, diarrhea, dyspepsia, fever, fits, hysteria, inflammation, insomnia, jaundice, nerves, neuralgia, rheumatism, and worms.³² Moerman¹⁷⁶ gives interesting insight on Amerindian uses of a plant alien to them originally. Delaware Indians heated a small bag of leaves to apply to earache or toothache. More interesting was the Delaware use of hops as a sedative, drinking hop tea several times a day to alleviate nervousness. Cherokee, Mohegan, and Fox also used the plant as a sedative. George III is said to have slept on a pillow stuffed with hops to alleviate some symptoms of his porphyria. I would personally not hesitate to drink a camomile-hop-valerian tea as a sedative or herbal sleeping potion, but I would never recommend it to anyone else. The antibiotic principle lupulone is tuberculostatic.⁶⁰

According to the *Wealth of India*, hops contain 6 to 12% moisture, 11 to 21% resins (no tetrahydrocannabinols), 0.2 to 0.5% volatile oils, 2 to 4% tannins, 13 to 24% protein, 3 to 4% fructose and glucose, 12 to 14% pectins, and 7 to 10% ash.¹ Hops contains 0.3 to 1% volatile oil; 3 to 12% resinous bitter principles composed of alpha-bitter acids (humulone, cohumulone, adhumulone, prehumulone, posthumulone, etc.), and beta-bitter acids (lupulone, colupulone, adlupulone, etc., in decreasing concentration); other resins, some of which are oxidation products of the alpha- and beta-acids; xanthohumol (a chalcone); flavonoid glycosides (astragalol, quercitrin, isoquercitrin, rutin, kaempferol-3-rutinoside, etc.); phenolic acids; tannins; lipids; amino acids; estrogenic substances; and many others.²⁹ The volatile oil is made up mostly of humulene (alpha-caryophyllene), myrcene, beta-caryophyllene, and farnesene, which together may account for over 90% of the oil. Other compounds present number over 100, including germacatriene, alpha- and beta-selinenes, selina-3,7(11)-diene, selina-4(14),7(11)-diene, alpha-copaene, alpha- and beta-pinenes, limonene, *p*-cymene, linalool, nerol, geraniol, nerolidol, citral, methylnonyl ketone, other oxygenated compounds, 2,3,4-trithiapentane (present only in oil of unsulfured hops in *circa* 0.01%), S-methylthio-2-methylbutanoate, S-methylthio-4-methylpentanoate, and 4,5-epithiocaryophyllene.²⁹ Countering claims that the "wonder cure" GLA (gamma-linoleic acid) is found only in mother's milk and evening primrose, I consulted the USDA lab at Peoria and learned that GLA was also in hops and borage, to mention just a few of the other vegetable sources.

Toxicity — Listed as a sedating, soporific narcotic.⁵⁴ Hops dermatitis has long been recognized. Not only hands and face, but legs have suffered purpuric eruptions due to hop picking. Although only 1 to 3000 workers is estimated to be treated, one in 30 is believed to suffer dermatitis.⁶