

Kombucha

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Kombucha is a sweetened green or black tea that is fermented with the help of a Symbiotic Culture of Bacteria and Yeast (SCOBY). This results in a fizzy, slightly sour, slightly sweet tea that resembles the taste of cider. Consumed as a functional beverage since 220 BC, kombucha has been touted as the miracle cure for a variety of illnesses.

PREPARATIONS: Kombucha tea can be prepared at home using a starter kit containing a SCOBY, or bought commercially as a bottled kombucha product.

COMMON NAMES: Mushroom tea, Manchurian mushroom, tea fungus, Kargasok tea, kwassan, teekwass, champagne of life, t'chai from the sea, and others.

ACTIVE CONSTITUENTS: Fermentation of the sweetened tea is facilitated by a SCOBY – a floating microbial colony that resembles a mushroom and consists of a symbiotic mixture of yeasts and aerobic bacteria. *Acetobacter xylinum* is the primary bacterium in the colony, while the yeast composition is highly variable. These microbes

act to convert the sugar in the tea to glucose, fructose, acetic acid, gluconic acid and ethanol (typically less than 1%), as well as minor microbial metabolites, vitamins B and C, and tea polyphenols such as catechins, theaflavins and thearubingens.

MEDICAL CLAIMS: Consumption is claimed to improve digestion, strengthen the immune system, relieve arthritis, reduce blood pressure, maintain healthy cholesterol levels, and cure peptic ulcer disease, cancer, asthma and diabetes. It is also purported to have hepatoprotective properties, offer protection from pathogenic microorganisms, and relieve haemorrhoids, promote weight loss, detoxify the body and promote general well being, among many other claims.

EVIDENCE: There is limited clinical evidence to substantiate the medical claims for kombucha. The acetic acid and catechins in kombucha are thought to be responsible for *in vitro* antimicrobial activity against *H. pylori*, *E. coli* and *S. aureus*, while the liver detoxifying properties are proposed to be due to effects on the glucuronidation pathway. Other properties, such as

Summary message

There is a lack of scientific evidence to support the many health claims of kombucha. While some studies suggest that kombucha does possess antimicrobial, antioxidant, free radical scavenging and detoxification effects, the studies have largely been *in vitro* or *in vivo* in animal models. Consumption has led to adverse effects and death in vulnerable individuals, and should be avoided in those who are at risk of metabolic acidosis, or are sick or immunocompromised. Use should be discouraged in pregnancy and lactation. Kombucha should not be taken with disulfiram due to its alcohol content.

Herbal medicines are a popular health care choice, but few have been tested to contemporary standards. **POTION OR POISON?** summarises the evidence for the potential benefits and possible harms of well-known herbal medicines.

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antioxidant and anticancer activities, are postulated to be mainly due to tea phenols and the presence of ascorbic acid, which are shown to be in higher concentrations in kombucha than in unfermented tea. These biological activities are dependent on type of tea, fermentation time, microbiota of the culture, and nature and quantity of metabolites formed. None of these effects have yet been adequately evidenced through human trials.

ADVERSE EFFECTS: Several cases have shown kombucha consumption to be harmful where the preparation has been incorrectly prepared. Excessive consumption should be avoided in individuals with pre-existing conditions that may lead to metabolic acidosis. Nausea and dizziness have been reported after consuming certain kombucha products, and allergic reactions, jaundice, and head/neck pain have occurred in a few patients. Kombucha should be avoided in pregnant or lactating women.

DRUG INTERACTIONS: Disulfiram will interact with the alcohol in kombucha tea so this combination should be avoided.

Key references

1. Greenwalt CJ, Steinkraus KH, Ledford RA. Kombucha, the fermented tea: microbiology, composition, and claimed health effects. *J Food Prot.* 2000;63(7):976–81. doi:10.4315/0362-028X-63.7.976
2. Dufresne C, Farnsworth E. Tea, Kombucha and health: a review. *Food Res Int.* 2000;33:409–21. doi:10.1016/S0963-9969(00)00067-3
3. Jayabalan R, Malbasa VR, Loncar ES, et al. A review on Kombucha Tea – microbiology, composition, fermentation, beneficial effects, toxicity, and tea fungus. *Compr Rev Food Sci Food Saf.* 2014;13(4):538–50. doi:10.1111/1541-4337.12073