Kombucha – Comprehensive review on Microbiology, Chemical Composition, Antioxidant, Biological and Therapeutic Properties

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Abstract:

Fermentation is one of the oldest preservation techniques used by mankind with known actions of fermentation dating back to several millennia before the common era. Kombucha, originated in China 2000 years ago, is a sour and sweet-tasted drink, prepared traditionally through fermentation of black tea. Kombucha is a low alcoholic beverage with high content of bioactive compounds derived from plant material (tea, juices, herb extracts) and metabolic activity of microorganisms (acetic acid bacteria, lactic acid bacteria and yeasts). Currently, it attracts an increasing number of consumers due to its health-promoting properties. Kombucha tea, a fermented beverage, has recently become popular in the United States as part of the functional food movement. This popularity is likely driven by its touted health benefits, coupled with the recent scientific movement investigating the role of the microbiome on human health. The studies promote the search for alternative raw materials for the production of kombucha, in addition, new ingredients interfere in the production, constitution, and nutritional potentialities of the beverage, as well as its functionality in the face of diseases. An overview of the brewing and manufacturing of the beverage including different brewing techniques and ingredients, discussion of the biochemical and microbiological aspects of the fermentation process, the flavor and chemical profile of kombucha, as well as the impacts of kombucha on human health. The article indicates the shortcomings in the current research in the field of Kombucha, as well as future perspectives on improving the health-promoting activities of this fermented drink.

Keywords:

Kombucha tea; fermentation; functional beverages; microbiology, antioxidant properties, biological properties, therapeutic properties, and regulation.

Introduction:

Although fermented foods have been a staple of cultures internationally for thousands of years, kombucha has only recently become popular in the United States (Julie and Walton, 2019).

Kombucha is reported to have originated in northeast China about 220 B.C., disseminated to Japan in 414 A.D. as a medicine, and spread through trade routes to Russia and eastern Europe (Jayabalan et al., 2014; Dufresne and Farnworth, 2000). Kombucha's worldwide popularity has fluctuated since World War II (Jayabalan et al., 2014). Recognizing the growing market, in 2016, PepsiCo purchased KeVita, a popular functional probiotic and kombucha beverage maker. In 2017, retail sales of kombucha and other fermented beverages increased 37.4% (Watson, 2017). The great global trend in demand for healthy foods and drinks high- lights that kombucha has attracted the attention of consumers. Kombucha's global market was valued at $1.9 billion in 2019, with a Com- pound Annual Growth Rate (CAGR) of 16.8 % from 2020-2025 (Oliveira et al., 2023). The market is forecasted to continue its growth, reaching between USD 3.5 to 5 billion by 2025 (Intelligence, 2020).

Tea (*Camellia sinensis* L.) is the most important non-alcoholic beverage having worldwide popularity. It is consumed as a morning drink by 2/3rd of the world population. It is mainly consumed in the form of 'fermented tea' or 'black tea', 'non-fermented' or 'green tea' and 'semi-fermented' or 'oolong tea' which is also popular in Japan and China. Tea leaves have more than 700 chemical constituents, among which flavonoids, amino acids, vitamins (C, E, K), caffeine and polysaccharides are important to human health. However, the stimulative effect of tea is due to caffeine (1.25-45.5%) (Kurian and Peter, 2007). Microbiological Research: The black tea infusion contains proteins, amino acids, volatile compounds, lipids, enzymes and polyphenols, which make it as a good fermentation medium (Hui, 1978). Microbial fermentation of black tea leads to production of *Kombucha* or tea cider, known to have therapeutic values. Moreover, recent research refers to kombucha, it is believed that fermented tea was first used in East Asia in 220 BC for its therapeutic effects. However, it originated in northeastern China (Manchuria) and was awarded the title of "Divine Che (remedy of immortality)" during the Tsin Dynasty (Ling Chi) for its detoxifying and energizing proper- ties (Coelho et al., 2020; Kim & Adhikari, 2020). (Rosma et al., 2016) Black tea has a strong body due to tannins, which are a group of astringent polyphenolic compounds such as flavonoids (theaflavin and thearubigin) and others derivatives of polyphenols. The natural tannins are powerful reducing agents and exhibit a marked tendency to absorb oxygen, thereby, making tea infusions a possible health drink due to its antioxidant property. Black tea is a good fermentation medium because its infusion contains proteins, aminoacids, volatile compounds, lipids, enzymes and more importantly polyphenols (Martin and Arnold, 1978). Black tea fermented with yeast accumulates the vitamins A, C and B complex, making it a nutritious and a therapeutic agent (Chand and Gopal, 2005), besides increasing shelf-life (Liyanage et al., 1988). Tea cider also known as *Kombucha* (traditional fermented product), is a fermented tea that is of en-drunk for medicinal purposes. Fermented tea decoctions such as "*Kombucha*" have been prepared by co-fermentation with yeast and acetic acid bacteria, and are known to have health benefits (Guapadu et al., 2000). During COVID-19 pandemic, the consumption and demand of fermented beverages has increased in many countries as they have been reported to display antioxidant and other beneficial effects (La Torre et al., 2021).

History:

Most of the world population, especially people in highly developed countries, has demonstrated increased awareness and interest in functional food, i.e., food that positively effects upon bio-regulatory functions and human health (Kumar and Joshi, 2016). Such an interest lasted for a few decades, having great impact in the development of food industry. The consumption of *Kombucha* was first practiced in 220 B.C. in Manchuria (Jayabalan et al., 2014), the tea was sought for its magical properties. As trade routes extended beyond the Far-East, It, then, spread to Russia where *Kombucha* is called *teakwas*. This beverage was introduced into Germany during World War II, in the 50's arrived into France and France-dominated North Africa (Blanc, 1996). Presently, *Kombucha* is popular in the United States, due to its refreshing power and curative effects. Europeans would drink kombucha for its detoxifying effects on the blood and digestive system (Greenwalt et al., 2000). Around 415 A.D., a Korean physician named Dr. Kombu was summoned to treat Emperor Iynko of Japan for a digestive disorder. A number of Japanese people at the time felt that tea has mystical healing properties (Bishop et al., 2022). Dr. Kombu used the kombucha culture along with other early medical herbal remedies to treat the emperor's symptoms. The combination of the herbs and kombucha yielded great success which could provide an alternative explanation for the namesake of the drink (Crum et al., 2016). Due to its suggested therapeutic effects, its role in improving health, and alleged abilities such as delaying aging, kombucha has become a popular functional food in recent years, particularly in the Western hemisphere and especially in the United States (Akan et al., 2018; Onsun et al., 2025).

Microbiology:

Acetic acid bacteria (*Acetobacter xylinum, Acetobacteraceti, Acetobacter pasteurianus, Gluconobacter oxydans*) (Greenwalt et al., 2000) and yeast (*Saccharomyces sp., Zygosaccharomyces sp., Torulopsis sp., Pichia sp., Bre anomyces sp.*) are the main microbes having the symbiosis in tea fungus responsible for *kombucha* fermentation. The variation of its composition could be due to geographic, climatic and cultural conditions as well as depends on the types of wild yeast and bacteria that exist locally (Petrovska and Tozi, 2000 and Teoh et al., 2004). The fermentation is two steps fermentation in which, yeasts ferment the sugar to ethanol, which is further oxidised by the acetic acid bacteria to produce acetic acid in the second fermentation. The result is reduced pH of medium. Both ethanol and acetic acid have antimicrobial activity against pathogenic bacteria, thereby, providing protection against contamination of the tea fungus (Liu et al., 1996). A culture of *Kombucha* is a living organism exposed to many influences, which gives the final beverage a different chemical composition and taste (Petrovska and Tozi, 2000).

Preparation of Kombucha:

Brewed tea is the substrate on which the microorganisms grow to produce the final product that is *Kombucha*. Black tea is usually used for *Kombucha* preparation, green tea and herbs are also used (Kumar, et al., 2016). It has been shown that green tea has a more stimulating effect on the *Kombucha* fermentation than black tea, yielding the fermentation in a short time frame (Greenwalt, et al., 1998). Black tea and white sugar are the best substrates for the preparation of *Kombucha*, although green tea can also be used (Reiss, 1994). The process of preparation of

Kombucha is shown in Figure 1, (Kumar and Joshi, 2016). After the fermentation process is completed, the main products formed in kombucha are ethanol, gluconic acid, and acetic acid. In addition to these compounds, it contains tea polyphenols (catechins, theaflavins, and flavanols) since the substrate is tea, organic acids (*e.g.* folic, lactic, carbonic, glucuronic, oxalic, malic, malonic, tartaric, succinic, pyruvic, citric, and usnic acids), water-soluble vitamins (*e.g.* B1, B2, B3, B6, B12, and C) as well as vitamin E, enzymes (amylase and invertase), amino acids, proteins, purines, and minerals (Kaashyap et al., 2021). It has been shown that the rate of phenolic compounds in kombucha prepared using black and green tea, which left to fermentation with tea residues without filtering, was 5.68 times higher than those designed by filtration (Zhou et al., 2022).

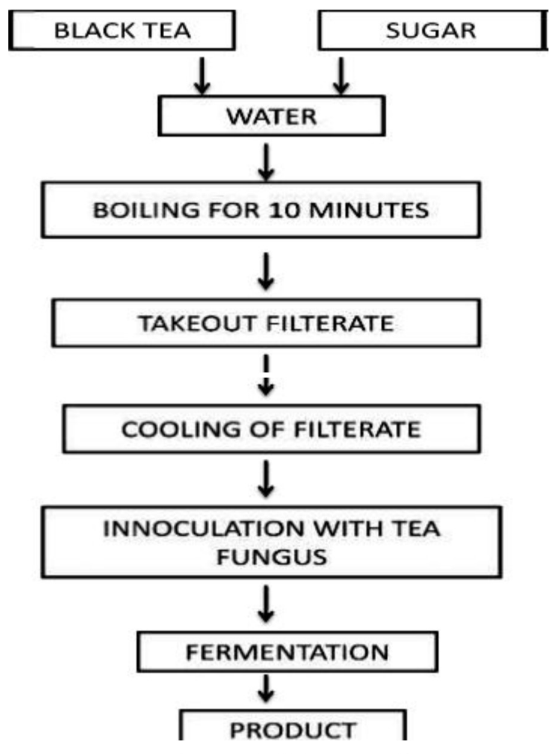

Figure 1: Schematic Diagram of Kombucha Manufacture

Must Preparation:

Tea leaves are added to boiling water and allowed to infuse for about 10 min a er which the leaves are removed and sweetened with sucrose 50 to 150g/ml (5 to 15%). Sucrose (Greenwalt et al., 2000) is dissolved in the hot tea. This must is allowed to cool at room temperature (Jayabalan et al., 2014). In a study, black tea, green tea, yerba mate, lavender, oregano, and fennel were used as substrates and the antioxidant activities of biofilms obtained by fermenting with the kombucha symbiotic mixture in presence of sucrose (100 g/L) were compared (Tapias et al., 2022). Biological activities and total phenolic content were compared in kombucha using different percentages of *Curcuma longa* L. rhizome by Zubadiah et al. (2021). The amount of acetic and lactic acids along with soluble proteins was found to escalate in kombucha prepared by adding *Stevia rebaudiana* (Bertoni) Bertoni leaves to green tea extract (Fereydooni et al., 2021). Kombucha is traditionally produced from green, oolong or more commonly black tea (Figure 2). The production of Kombucha starts with tea preparation of infusion. To the 1 L of boiling tap water, usually 5 g of tea leaves are added and allowed to infuse with initial temperature between 70 and 95°C (Tran et al., 2020). After removing the leaves by filtration, from 50 to 150 g/L of sucrose is dissolved in the hot tea. Before introducing the tea fungus, the infusion is cooled down to about 20°C.

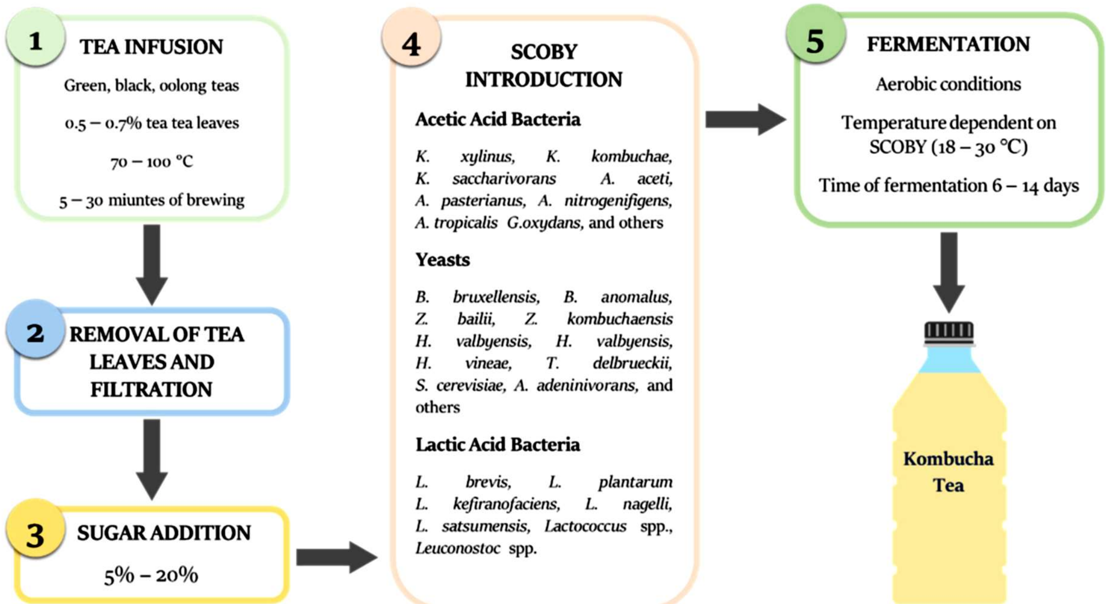

Figure 2: Main stages of Kombucha tea production along with data ranges used in various scientific research (Hubert et al., 2021)

Innoculation and Fermentation:

Tea is poured into a wide-mouthed clean vessel and the microbial mat or colony from previous batch of *Kombucha* is added to the sweetened tea with about 100 ml of *Kombucha* from previous fermentation. Markov et al., (2006) reported that isolated strains of yeasts and acetic acid bacteria from tea fungus may be used as started cultures for obtaining of *Kombucha*. Further, it was revealed that, the fermentation was faster in medium inoculated with fermentation broth compared to the fermentation with the starter cultures. The fermentation stage mainly includes the symbiotic fermentation of a variety of probiotics as shown in figure 3. The fermentation time is dependent on initial count of yeasts cells. The tea fungus is laid on the tea surface, and the jar is carefully covered with a clean cloth and fastened properly. The preparation incubated at room temperature (between 20° and 30°C) for 7-10 days. If the fermentation is allowed to continue beyond the 10 days, the acidity may rise to levels potentially harmful to consume. During fermentation, a daughter tea fungus is formed at the tea surface. The tea fungus is removed from the surface and kept in a small volume of fermented tea. The beverage is passed through cheese-cloth and stored in capped boles at 4°C (Jayabalan et al., 2014). *Kombucha* is traditionally prepared by fermentation of sweetened (sucrose) black tea. This medium (freshly prepared medium) is usually inoculated with cellulose pellicle formed during the previous cultivation and incubated statically under aerobic conditions for 7-10 days. However, some authors (Chen and Liu, 2000) have investigated changes in major compounds of tea fungus metabolites during prolonged fermentation of up to 60 days.

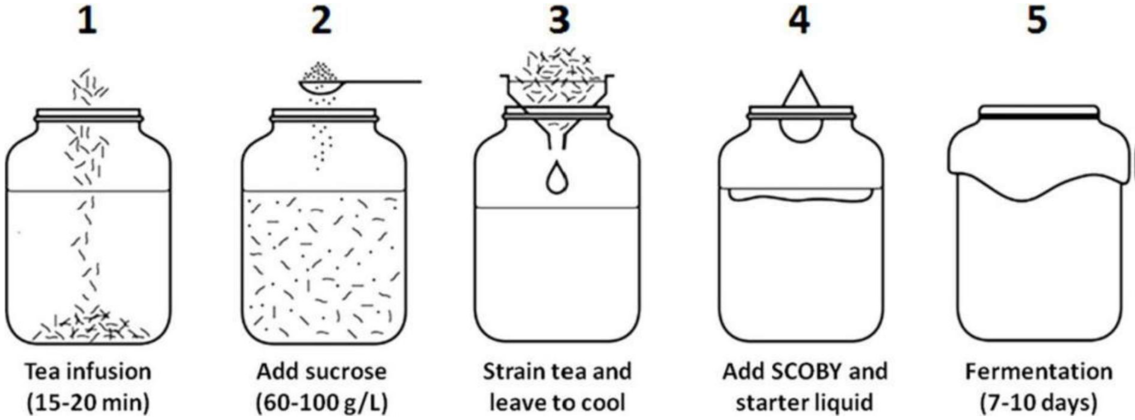

Figure 3: Kombucha's specific Fermentation Process (Hui, 2023)

A study conducted by Carvalhes et al., (2020) demonstrated that storing kombucha in a refrigerator will reduce the viability of beneficial microorganisms within the tea while potentially promoting the proliferation of undesirable microorganisms. Additionally, pasteurization is a crucial process for ensuring food safety and preventing problems that might arise during storage. Through pasteurization, excessive alcohol production and acidification of the beverage are avoided (Barros et al., 2020). For this reason, it is recommended that the final obtained beverage be filtered after a pasteurization process and stored in closed containers, allowing for the removal of cellulose residues and unwanted masses of microorganisms in the suspension (Santos, 2016). The production stages and control parameters for kombucha are summarized in figure 4.

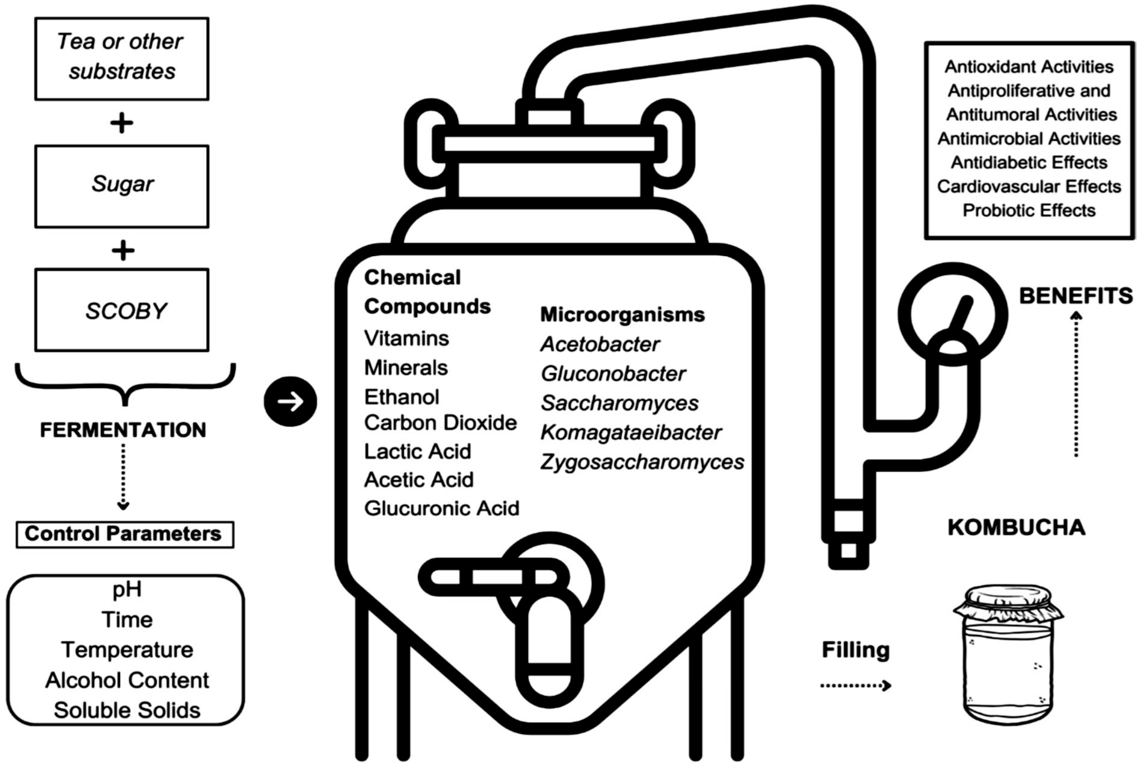

Figure 4: Production stages and control Parameters for Kombucha
(Santos, 2016; Onsun et al., 2025)

Biochemical Changes in Kombucha:

The fermentation and oxidation processes start, when the tea fungus is placed in a freshly prepared infusion of tea and sugar. When grown in sucrose medium, the yeast break-down sucrose in glucose and fructose, then produce carbon dioxide and ethanol, which are oxidized to acetaldehyde by acetic acid bacteria. The tea fungus produces many other substances, like gluconic acid and vitamins, which with the supply of tea nutrients, give the drink its unusual flavor and healing properties. During the process, the glucose is polymerized and produces cellulose and hemi-celluloses (Greenwalt et al., 1998; Bauer and Petrushevska, 2000). The type of tea plant chosen for the substrate, the duration of fermentation, the types of microorganisms involved in the SCOBY, the metabolic activities of those microorganisms, and the type and amount of sugar used have all been found to influence the quantity of bioactive substances in the final product (Bortolomedi et al., 2022). It is also reported that the fermentation process induces the synthesis of the B complex of vitamins and folic acid. The pH value of *Kombucha* decreases during the fermentation process following the increase in the organic acid content (Blanc, 1996; Riess, 1994; Sievers et al., 1995). Similar finding has been observed by Kumar et al., (2015), Kumar et al., (2016) and Joshi and Kumar (2016) during the fermentation of apple tea wine.

Components of Kombucha:

Kombucha contains the organic acids, active enzymes, amino acids, and polyphenols produced by these microbes. The precise quantities of this component a sample can only be determined by laboratory analysis. Finished *Kombucha* may contain any of the following components.

These components are acetic acid (mildly antibacterial), butyric acid, B-vitamins (Aleksandra et al., 2007), alcohol, gluconic acid, lactic acid, malic acid, oxalic acid and usnic acid. Normal *Kombucha* contains less than 0.5% alcohol, which classifies *kombucha* as a non-alcoholic beverage. Older, more acidic, *kombucha* might contain 1.0% or 1.5% alcohol, depending on more anaerobic brewing time and higher proportions of sugar and yeast.

Therapeutic Properties:

Tea cider (*Kombucha*) is associated with many health benefits. Kombucha traditional is mainly composed of vitamins, organic acids, minerals, sugars, antioxidant compounds, and other components, as seen in Figure 5. Kombucha is a source of bioactive compounds such as polyphenols and glucuronic acid. The benefits of kombucha can be at- tributed to the synergistic effect between the compounds, making the drink potentially beneficial to health (Martínez Leal et al., 2018). It possesses characteristics of functional food and known for a few thousand years. It originated in China, 220 BC, Korea and Japan.

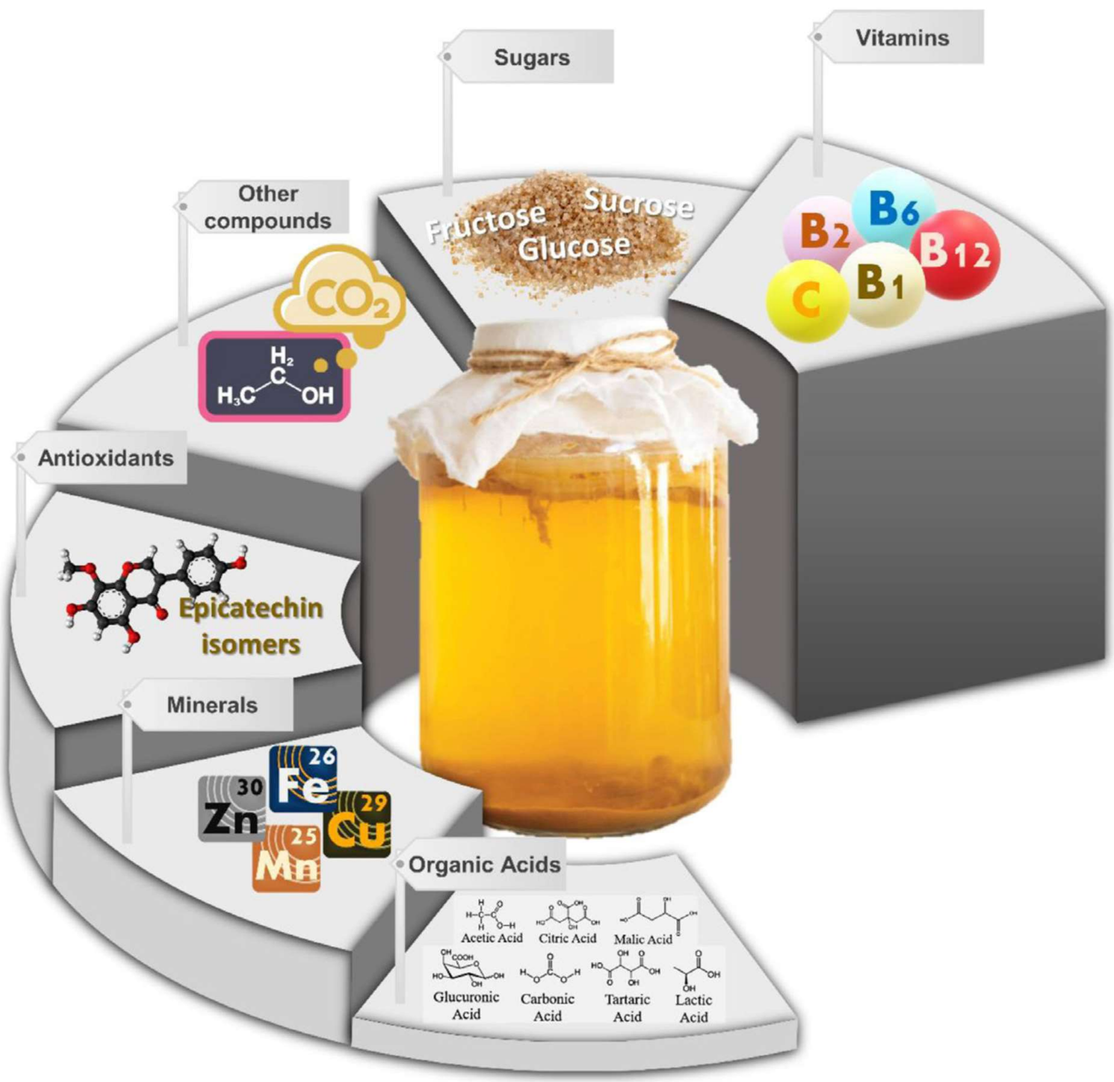

Figure 5: Chemical Composition of Traditional Kombucha (Oliveira et al., 2023)

Petrovic and Loncar (1996) and Malbasa et al., (2002), have determined content of vitamin C in fermentative liquids of tea fungus. Activity of vitamin C as well as activities of other compounds present in *Kombucha* fermentation system is modified in a positive way by the chemical environment in the fermented beverage. Therefore, vitamin C and other constituents of *Kombucha* beverage protect human health more efficient than the same isolated compounds. Vitamin C is also an essential component of the human diet. It enhances iron adsorption (Cook and Redd, 2001; Halberg and Hulthen, 2000), prevents megaloblastic anemia (Jacob, 1994) and reduces stomach cancer (Hemila and Herman, 1995). Due to the rich biomass in tea fungus (*Medusomyces gisevii*), it can be utilized as protein supplement in animal feed (Jayabalan et al., 2010). They further revealed that tea fungus is rich in crude protein, crude fibre, and amino acid lysine. The biochemical characteristics of tea fungus studied were increased throughout the fermentation time during the study of biochemical characteristics of tea fungus produced during *Kombucha* fermentation. The beneficial effects of *Kombucha* tea are attributed to the presence of tea polyphenols, gluconic acid, glucuronic acid, lactic acid, vitamins, aminoacids, antibiotics and a variety of micronutrients produced during the fermentation (Jayabalan et al., 2008). Jayabalan et al., (2008) demonstrated that *Kombucha* tea prepared from green tea, black tea and tea waste material have excellent antioxidant activities. *Kombucha* exhibited increased free-radical scavenging activities during fermentation. The extent of the activity however, depends upon the fermentation time, type of tea material and the normal microbiota of *Kombucha* culture, which in turn determined the forms of their metabolites. Although free-radical scavenging properties of *Kombucha* showed the time dependent profiles, prolonged fermentation was not recommended because of accumulation of organic acids, which might reach harmful levels for direct consumption. The identification of extracellular key enzymes responsible for the structural modification of components during *Kombucha* fermentation and potent metabolites responsible for the free-radical scavenging abilities are necessary to elucidate the metabolic pathway during *Kombucha* fermentation. Metabolic manipulations may be one of the effective methods to elevate he antioxidant activities and fermentation efficiency of *Kombucha*. However, *Kombucha* consumption has proven to be harmful for individuals with preexisting conditions or illness or if incorrectly prepared (Greenwalt et al., 2000).

Antioxidant Properties:

This ability to effectively fight free radicals can be explained by the high content of phenolic compounds, mainly flavonoids, contained in the substrate used for the beverage preparation (Chakravorty et al., 2016; Xu et al., 2017). Approximately 127 phenolic compounds (70.2% flavonoids, 18.3% phenolic acids, 8.4% other polyphenols, 2.3% lignans, and 0.8% stilbenes) were identified in green and black tea beverages fermented by kombucha culture over 10 days. In addition, fermentation with tea residue can produce beverages rich in polyphenols and have higher antioxidant activity than those produced without tea residue (Zhou et al., 2022). Fermentation temperature affects diverse characteristics of the beverage, like the antioxidant capacity. Xia et al. (2019) studied soymilk fermentation at 28°C and 37°C and analyzed the factors like bioactivity and chemical compositions. The total contents of phenolic, ferulic acid, chlorogenic acid, and ascorbic acid increased significantly after fermentation at 37°C. The antioxidant (DPPH/ABTS ± scavenging ability and FRAP) and inhibitory activities for α-

glucosidase and α-amylase of kombucha-fermented soymilk increased significantly and were higher at 37 °C if compared with 28 °C (Xia et al., 2019). Tanticharakunsiri et al. (2021) fermented kitchen mint leaves (*Mentha cordifolia* Opiz Ex Fresen*)* and oolong tea leaves (*Camellia sinensis*) to produce kombucha. On the 14th day of fermentation, phenolic compounds and flavonoids were increased in all kombucha samples. The number of acetic acid bacteria and yeasts in kombucha gradually in- creased during the 7-to-14-day fermentation. The DPPH (2,2-Diphenyl-1-picrylhydrazyl) and ABTS (2,2′-azino-bis(3-ethylbenzothiazoline-6- sulfonic acid) antioxidant activity of these kombuchas increased during the fermentation period and showed the highest antioxidant capacity on the 14th day. There are also articles in the literature on the use of fermented and non-fermented kombucha extracts, and Ziemlewska et al., (2022) evaluated the potential use in the cosmetic area. The authors evaluated the chemical composition and biological activity of the leaves of *Rubus fruticosus* L *., Vaccinum myrtillus* L *., Ribes nigrum* L *.,* and *Fragaria vesca* L *.,* especially for *R. fruticosus* and *V. myrtillus* ferments, through DPPH and ABTS assays. Also, the development of applications from kombucha has been de- scribed in the literature. Kaya and Asir (2022) develop freshly formulated bread products from kombucha tea, fermented from black and green tea leaves, and compare them with classic recipe bread. As a result, it was observed that the addition of kombucha tea significantly increased the total phenolic content of the crumb (31.5–37.3%) and crust (54.3–60.3%) in the bread. The antioxidant activities evaluated by the ABTS + and DPPH methods showed that bread products with significantly higher radical scavenging properties were produced in the crumb and crust of freshly formulated bread (Kaya and Asir, 2022). In a study conducted to determine the shelf life of home-made kombucha, it was shown that the storage time of kombucha prepared after one month of fermentation of sweetened black tea in a dark and cool (+4◦C) environment can be a maximum of 4 months (La Torre et al., 2021). In a study by Ivanisova et al., (2020), antioxidant capacity was determined by trolox equivalent antioxidant capacity (TEAC) method in the kombucha obtained by fermentation of black tea (1318.56 ± 5.02 mg TEAC/L), which had 4 times higher antioxidant activity compared with unfermented black tea (345.59 ± 3.58 mg TEAC/L). The authors concluded that higher antioxidant activity after fermentation was related to the distinct rise in phenolic amount. In this regard, when total phenolic amounts were compared, twice more increase in total phenolic amounts was observed upon fermentation. Kaewkod et al., (2019) reported that green tea-derived kombucha was found to have the highest antioxidant activity among kombuchas prepared by fermentation of green tea, oolong tea, and black tea. However, differences in final products due to variations in fermentation conditions, tea substrates, and analytical methods highlight the necessity of further standardized research to confirm the bioactive properties of kombucha and optimize its health benefits (Mihai et al., 2024).

Biological Properties:

Regular consumption of kombucha is believed to have health benefits. Given its long history of consumption, especially as a health-promoting beverage, kombucha has continually been explored for its beneficial properties (Dutta and Paul, 2019). Kombucha protective activities can mainly be attributed to the presence of organic acids and phenolic compounds that are produced as a result of microbial fermentation (Bhattacharya et al., 2016). In addition, the kombucha starter microbial culture (Malbaša et al., 2011) and the fermentation time (Chu and Chen, 2006; Puspitasari et al., 2017) can also influence the antioxidant capacity of the beverage. Many scientific reports prove that kombucha can exert antimicrobial activity against pathogenic bacteria and fungi. This is due to both compounds present in the substrates and the metabolites produced by the bacteria and yeasts present in the SCOBY kombucha that inhibit the growth of microorganisms with potential pathogenicity (Silva et al., 2021; Battikn et al., 2011; de Miranda et al., 2021). Still, despite not being able to receive any official claims about its health effects, kombucha can be considered a high-value food product in a healthy diet (Jayabalan et al., 2014). Kombucha is categorized as a symbiotic beverage due to its positive effects on the gastrointestinal microbiota, attributed to its short-chain fatty acids and metabolites (Sengun and Kirmizigul, 2020). The ingestion of kombucha was shown to enhance digestive health and elevate overall vitality by encouraging the proliferation of beneficial microorganisms within the intestinal tract. The probiotic bacteria present in kombucha promote the growth of *Lactobacillus* and *Bifidobacterium* species, particularly in the intestinal tract (Vargas et al., 2021). Thus, kombucha has become a popular choice for those seeking to enhance their digestive health (Watawana et al., 2016). Further research is needed to enhance our comprehension of the probiotic benefits of kombucha, particularly with regard to the impact of different fermentation processes and ingredients on the microbiota of the final product. Such studies will facilitate more comprehensive assessments and evaluations of the probiotic attributes of kombucha (Onsun et al., 2025).

Regulation:

In the United States, there is no specific legislation for kombucha, as fermented beverages and canned acidified foods are exempt from FDA regulation. According to the U.S. Centers for Disease Control and Prevention (CDC), a daily kombucha consumption of 110 mL for healthy individuals poses no health risk. However, possible risks may be related to excessive drinking or consumption by individuals with pre-existing health problems (Nummer, 2013). However, kombucha is defined as a fermented bever- age produced by a "special process" and to obtain it, the manufacturer must submit to a HACCP (risk analysis and critical control points) plan (Coelho et al., 2020; de Miranda et al., 2022). In order to control the process and ensure food safety for beverage consumers, the Pennsylvania Department of Agriculture (USA) has published a document with guidelines for the production and packaging of kombucha. The scarcity of information about the safety and quality of the drink and specific legislation can be one of the factors that condition the purchase and consumption of kombucha (Batista et al., 2022; Moodi et al., 2021). The definition of norms guarantees the standards of quality, efficacy, and safety of the product (Batista et al., 2022). In addition, stricter regulations are needed to standardize the industrial production of beverages globally (de Oliveira et al., 2022).

Conclusion:

The health-promoting properties of the sweet-sour, sparkling Kombucha tea have been known for over 2000 years. Tea cider known as “Kombucha” or “tea kvass”, tasting like sparkling apple cider is commonly produced at home by fermentation using a tea fungus (acetic acid bacteria and yeast). Kombucha has been gaining popularity for the last several decades, because of its health promoting properties. Due to kombucha's increased popularity, kombucha can now be purchased at the local supermarket and are no longer restricted to your local health food store. A glimpse of literature revealed that Kombucha is a good source of the bioactive compounds which make it as a functional beverage. A number of compounds are found in kombucha such as organic acids, polyphenols, vitamins, and other bioactive compounds that can all be altered by simply altering the starting tea matrix and the fermentation environment. Several the bioactive com- pounds that have known health promoting properties are known to be associated with the tea itself. Despite the fact that this drink has been known for a long time, there is no doubt that works on improving this product should be continued.

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