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Kombucha Unveiled: A Comprehensive Review of its Health Benefits

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Abstract: *Kombucha is a beverage made from the fermentation of sweet tea (Camellia sinensis) and added to a culture ofbacteria and yeast*
Theriseof the food market contributes to the balance of the gutmicrobiomeaswellasitsantibacterial and anticancer properties.
Note:the gut microbiome includes many bacteria, fungi, viruses, and other organisms. The gut microbiota exists symbiotically within the human digestive system and helps support energy harvesting, digestion, and immune defense.
Due to the increasing consumption and the large number of studies addressing this topic, it is necessary to carry out a bibliographic survey based on the most current and relevant works in this field.
In this sense, information is collected about the kombucha production process.
Bases used to prepare traditional drinks, or even other bases that give innovative properties to drinks; chemical and microbiological composition and variations; bacteria and yeasts characteristics, as well as its applications; possible benefits from consuming kombucha; toxic properties and, finally, regulations regarding the production and marketing of kombucha.
In addition to reviewing these topics, italso offers suggestions on how to mix drinks

Keywords: Kombucha tea, bioactive compounds, functional beverages, fermentation, acetic acid bacteria, yeasts.

I. INTRODUCTION

Kombucha is a fermented drink originating from Asia.
It has become popular in the West due to its medicinal effects, such as antibacterial, antioxidant, anticancer, antidiabetic, treatment of stomach ulcers, and high cholesterol.
It has also been shown to impact immune response and liver detoxification.The traditional drink was originally made from the fermentation of sweet black tea (Camellia sinensis).
However, other types of tea can also be used in preparation (Rodrigues et al., 2018).
Tea fermentation is the product of a symbiotic colony of bacteria and yeast installed in a cellulose membrane.
This cellulose membrane is called SCOBY (Symbiotic Colony of Bacteria and Yeast).
However, it is also known as tea mushroom or mother of kombucha (De Filippis et al., 2018; Chakravorty et al., 2016; Santos, 2016).
While osmophilic yeast ferment sugar in tea and produce ethanol, bacteria oxidize alcohol and produce acetic acid (Teoh et al., 2004)**.**
Other organic acids formed in addition to acetic acid, such as gluconic, lactic, malic, citric, and tartaric acids, have antibacterial activity and prevent kombucha from being contaminated with pathogenic bacteria (Neffe-Skocinska et al., 2017; Leal et al., 2018).
The beneficial effects of kombucha are due to the presence of probiotic microorganisms (acetic and lactic acid bacteria), antibiotics, amino acids, tea polyphenols, sugar, organic acids, ethanol, water-soluble vitamins, and many types of micronutrients are created during the production process (Jayabalan et al., 2008; Fu et al., 2014).
Regarding taste, according to Leal et al.(2018), kombucha is mildly acidic and slightly carbonated, so it is more accepted by consumers.

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It can be a low-alcohol substitute for sparkling wine or soft drinks due to its high carbonation content, providing a healthier alternative (Paludo, 2017).

Kombucha can be found on the market in non-alcoholic and low alcohol (less than 0.5% (v/v) alcohol) or even alcoholic versions (Nummer, 2013; Brasil, 2019).

The purpose of this review is to examine the various processes for beverage production, the capabilities of the substrates to produce it, the properties of the SCOBY and its applications, the chemical composition and microbiology of the beverage, possible benefits and contraindications regarding its consumption, some regulations applicable to the production and marketing of kombucha and finally present, in summary, form, Recommendations for mixing drinks.

Objective :

- Providing information on legislation on the production and sale of kombucha, and providing insights into quality control and safety.
- Providing suggestions and insights on how to blend kombucha with other beverages to enhance flavor and nutritional value..

II. RESEARCH METHODOLOGY

To complete this article exploratory research have taken place and referred to various research article, websites, periodicals, magazines, online interviews, etc

Origin of Kombucha

Fermented tea is believed to have been first used in East Asia for its medicinal benefits in 220 BC.

However, it originated in northeastern China (Manchuria), where it was used during the Tsin (Ling Chi) dynasty for its detoxifying and energizing properties (Jayabalan et al., 2016).In 414 CE, a doctor named Kombu is said to have brought tea to Japan and used it to treat Emperor Inkyo's digestive problems, hence the name "Kombucha" or "Kombu tea" (Santos, 2016).

Kombucha production process :

Kombucha is traditionally prepared from black or green tea (Jayabalan et al., 2016; Leal et al., 2018).

The ratio of tea and sugar as well as the fermentation time and temperature used in Kombucha production can vary depending on the region or consumer preferences (Jayabalan et al., 2016).

Typically, to produce kombucha, a tea base is prepared, then sugar is added, which serves as a substrate for bacteria and yeast to ferment the tea (Leal et al., 2018)

Substrate used to obtain kombucha :

The preparation of kombucha traditionally uses black and green tea (Battikh et al., 2012; Jayabalan et al., 2014).

Both are derived from the leaves of the Camellia sinensis plant; the difference between them lies only in the way the leaves are processed (Ahmed and Stepp, 2013).

Black tea is obtained from tea leaves that are crushed and exposed to high humidity, causing polyphenols to be oxidized by the enzyme polyphenol oxidase (Valenzuela, 2004).

A symbiotic culture of bacteria and yeast (SCOBY)

Kombucha culture or Symbiotic culture of bacteria and yeast (SCOBY) is a biofilm obtained from the symbiotic association between yeast and acetic bacteria, also known as “mushroom tea” because it resembles a carpet of mushrooms when grown in static conditions.

This biofilm grows in tea that is sweetened and cooled to form a cellulose film (Jayabalan et al., 2016).

SCOBY is the common name for the cellulose gelatinous film that forms on the surface of tea and has the function of performing

Microbial Metabolism in Kombucha Fermentation “

Although acetic acid bacteria and yeasts, such as Saccharomyces cerevisiae, have played well-defined roles in fermentation, their functions The functions and interactions that many microorganisms perform during kombucha fermentation are still largely unknown (Villarreal-Soto et al., 2018).

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Beneficial properties of Kombucha

Kombucha provides many human health benefits.

However, most of these benefits have only been studied in experimental models, lacking scientific evidence in human models (Jayabalan et al, 2014).Among the benefits reported by Dufresne and Farnworth (2000) include detoxification of the blood, reduction of cholesterol levels, reduction of atherosclerosis through cell wall regeneration, reduction of blood pressure, reduction of inflammatory problems infection, reduces pain and symptoms of arthritis

Toxic properties :

Jayabalan et al (2014) mention several cases of health problems reported by some individuals after drinking this beverage, such as dizziness and nausea, allergic reactions, headaches, lactic acidosis, and increased body temperature.

However, these symptoms have appeared in some isolated cases and are often related to overconsumption, poor hygiene during preparation, risks to the patient's health (HIV and acute kidney failure), and heavy metal contamination from containers used to preserve beverages**.**

Preparation of tea or infusion :

Tea or infusion can be prepared from the herb Camellia Sinensis, using 1-2% (w/v) of the loose herb.

or even in packet form, in the ratio recommended by the manufacturer.

It is recommended to add 5 to 10% (w/v) sucrose to the boiling water to heat treat the sugar.

After boiling, add the herbs and steep for 10 minutes.Then remove the bag or herbs and transfer to sweet tea**.**

Review of literature:

Kombucha is a fermented beverage with its origins in Asia, famed for its potential medicinal advantages. This review gives an overview of the history, manufacturing, and homes of Kombucha, with a focus on its chemical composition, microbial components, and ability fitness benefits and risks.

Kombucha's records dateback to 220 BC when fermented tea was first used for its medicinal houses in East Asia. Its origins can be traced to northeastern China (Manchuria), where it changed fed-on during the Tsin (Ling Chi) dynasty for its detoxifying and energizing outcomes. The call "Kombucha" is thought to have been derived from a physician named Kombu, who added tea to Japan in 414 CE to treat Emperor Inkyo's digestive ailments (Santos, 2016; Jayabalan et al., 2016).

Kombucha is traditionally crafted from black or green tea, with versions in the ratio of tea and sugar, fermentation time, and temperature depending on local and patron preferences. The technique involves making a tea base and including sugar as a substrate for bacterial and yeast fermentation (Jayabalan et al., 2016; Leal et al., 2018).

The number one substrates utilized in Kombucha manufacturing are black and green tea, each derived from Camellia sinensis leaves. The key distinction lies within the processing technique, with black tea regarding oxidation of polyphenols due to publicity to excessive humidity. These teas serve as the muse for Kombucha production (Battikh et al., 2012; Ahmed and Stepp, 2013). The Symbiotic Culture of Bacteria and Yeast (SCOBY) is a biofilm because of the symbiotic affiliation between yeast and acetic bacteria. This biofilm, also known as "mushroom tea," grows in sweetened and cooled tea, forming a cellulose movie. SCOBY performs an essential position in Kombucha production (Jayabalan et al., 2016).

While the roles of acetic acid microorganisms and yeasts like Saccharomyces cerevisiae in fermentation are well-defined, the capabilities and interactions of different microorganisms all through Kombucha fermentation continue to be in large part unknown. Research on this place is ongoing (Villarreal-Soto et al., 2018).

Kombucha is assumed to offer diverse fitness advantages, although many of those claims are supported mainly via experimental fashions and lack strong clinical proof in human research. These capacity advantages consist of cleansing low-density lipoprotein cholesterol discount, atherosclerosis prevention, blood pressure law, anti-inflammatory consequences, and relief from arthritis signs and symptoms (Dufresne and Farnworth, 2000).

While Kombucha gives capability fitness advantages, some remoted cases have said unfavorable results, along with dizziness, nausea, allergies, headaches, lactic acidosis, and elevated body temperature. These problems are frequently related to overconsumption, terrible hygiene all through training, or other fitness risks. Contamination from heavy metals in containers has also been a concern (Jayabalan et al., 2014).

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The evaluation additionally discusses the instruction of tea or infusion from Camellia Sinensis and the encouraged strategies for making candy tea, which serves as the base for Kombucha production.

III. CONCLUSION

Kombucha is a completely unique fermented beverage with a wealthy history and an extensive variety of potential fitness advantages. However, similar studies is needed to better recognize its microbial additives, health results, and ability dangers. Careful instruction and intake are important to ensure its protection and efficacy as a health-promoting beverage. This evaluation affords valuable insights into the records, production, and houses of Kombucha, losing light on its diverse attributes and ability for human fitness.

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