

Health Benefits of Herbal Tea: A Review

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Abstract

Herbal teas are a popular beverage worldwide and are used in numerous traditional medical practices. The objectives centered on the health benefits of herbal tea ingested by the Bangladeshi populace, the significant factors of herbal tea that affected adverse effects on human health, and the component availability of ten selected herbal teas in Bangladesh in terms of health issues. In the study, ten popular herbal teas were chosen: chamomile, peppermint, ginger, rooibos, hibiscus, lemon balm, coneflower (*echinacea*), dandelion, sage, and turmeric. After implementing exclusion criteria on health benefit related numerous publications obtained from medicinal herbs databases. Using plant species such as *matricaria*, *menthapiperita l.*, *zingiberofficinale*, *aspalathuslinearis*, *hibiscus*, *melissaofficinalis*, *echinacea*, *taraxacum*, *salvia officinalis* and *curcuma*, these studies examined the effects of herbal tea on human health, diabetes, cardiovascular disease and weight loss, mental stress removal, and relaxation. The leaves, seeds, and/or roots of various plants are essentially combined to make herbal tea. Contrary to popular belief, they are not derived from traditional tea plants but rather from tisanes. Numerous tisanes (herbal teas) have been used for their medicinal properties. Some are ingested for their energizing effects, which aid in inducing calm, preventing stomach or digestive issues, and boosting the immune system. Before consuming herbal teas or their ingredients, it is advisable to consult a professional who is knowledgeable about tea and its positive and negative adverse effects. If in doubt, one can always conduct their own research. In the interim, an increase in the consumption of low-calorie tea should be encouraged.

Keyword: Herbal Teas, Health Issues, Health Benefit, Effects, Tea Plants

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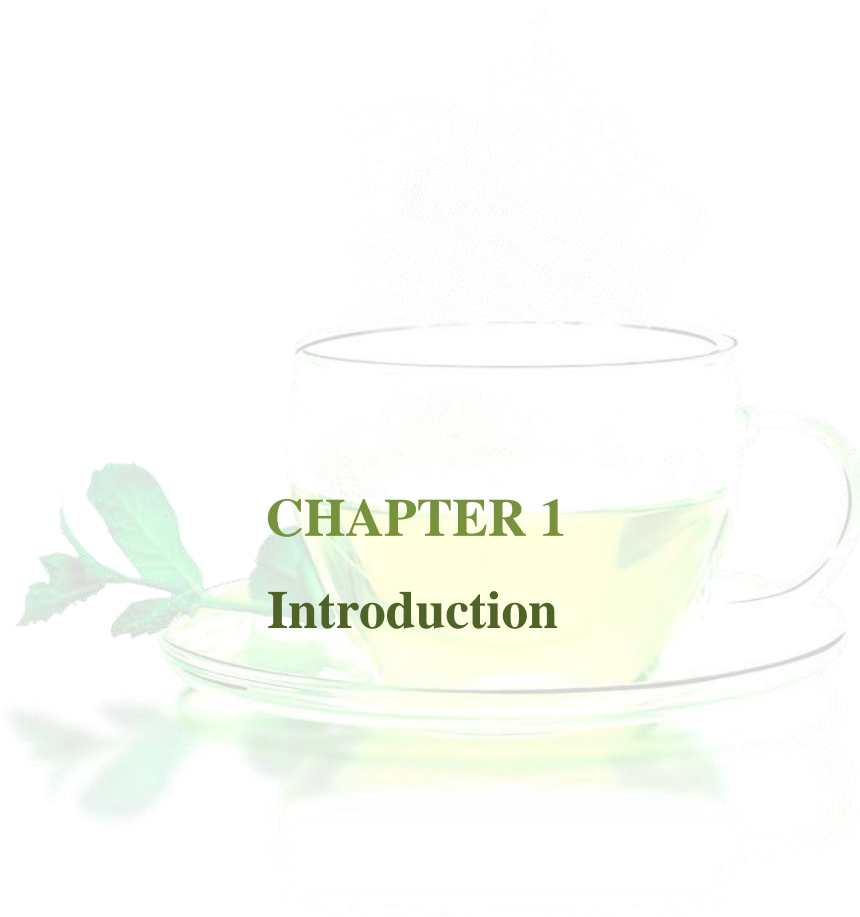
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CHAPTER 1

Introduction

1.0 Introduction

Based on a body of research relating tea drinking to a decreased chance of developing stroke and high blood pressure, the Bangladeshi Government recommends three cups of herbal tea per day in their national dietary guidelines. Herbal and herbal tea derived from the plant *Camellia sinensis* have been consumed for many thousand years, and the primary polyphenoliccatechins and tea flavin components have well-defined pharmacological advantages. In addition to the ever-popular herbal and black kinds (Saha et al., 2021), tea can also be brewed from the roots, leaves, flowers, and other plant parts of a vast array of plant species. These "herbal teas" contain a multitude of substances and could play an important role in supplying nutrients and chemicals to compensate for poor diets (Nibir et al., 2017). In Chinese, Indian, and other indigenous medicine systems, herbal teas have long been utilized as therapeutic vehicles. Some of the most popular herbal teas are based on blue, hibiscus, rose, tulshi (*Ocimum sanctum*), jasmine, ginseng, rosemary, peppermint, ginger, and other teas, with herbal teas anti-inflammatory and anti-mutagenic effects and peppermint oil's calming effects on the digestive system being highlighted. Due to the low expenses associated with in vitro research, there is a wealth of preclinical knowledge about phytoconstituents and their pharmacology (Zhao et al., 2013).

There is a need for additional human study into the short- and long-term advantages of herbal or herbal tea use, as well as the efficacy of production techniques such as fermentation of tea, which imparts a distinctive flavor and may improve biological activity. In many societies, tea is one of the most consumed beverages, second only to water. Its peculiar flavor, scent, and health-promoting properties, as well as its socio-cultural associations, are greatly regarded around the world. Herbal tea is available in a variety of forms, including loose leaves, tea bags, and powder. The popular beverage has been increasing globally. Herbal herbs of the unique cultivation method, it is exceptionally rich in antioxidant chemicals. According to the traditional procedure, the tea bushes are covered with bamboo mats for the majority of the growing season to protect the leaves from excessive sunlight.

In its 2014-2023 strategy, the World Health Organization (WHO) aims to capitalize on the use of traditional medicines, including herbal medicines, in order to keep populations healthy by providing access to effective and affordable alternatives to

medicine and by offering healthcare options that are consistent with people's cultural practices. The necessity to study the crucial concerns of effectiveness, safety, and quality assurance through the establishment of evidence-based approaches has increased as these tactics become increasingly incorporated into global and national healthcare policy. There are safety issues surrounding the amounts of fluoride after consuming black, herbal, and herbal teas, stressing the necessity for stringent quality assurance and standards.

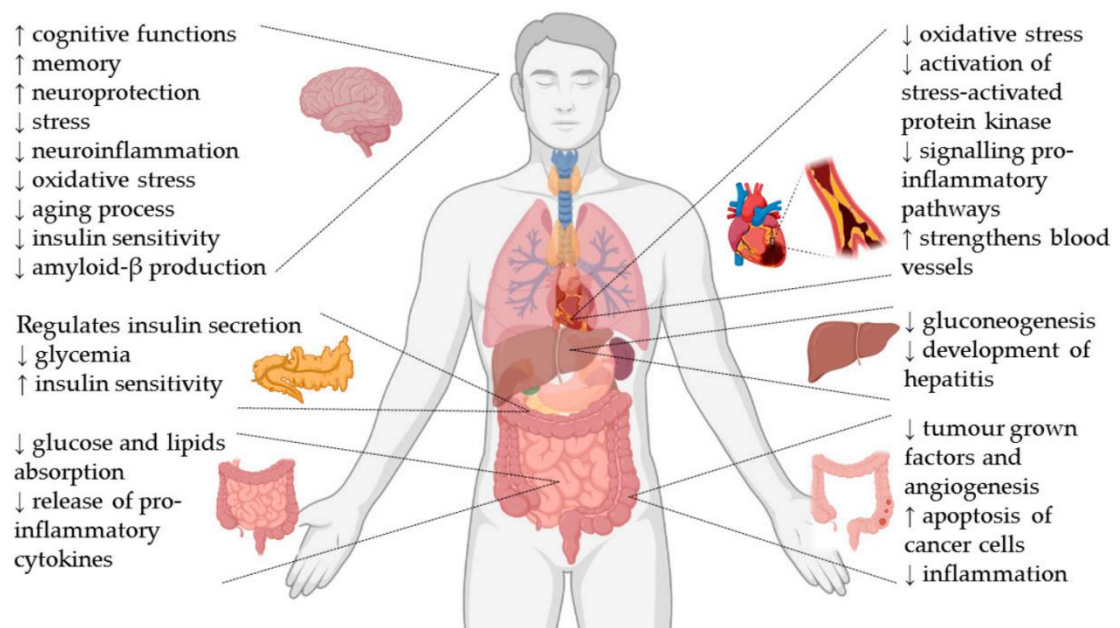


Figure 1: The primary health benefit of herbal and promoting qualities.

[Ref: Craig (1999)]

This study examined the health advantages of herbal tea and the extent to which previous research has investigated their human health efficacy. The primary objective was to conduct a scoping review using a specific technique to examine the health advantages of herbal tea in a systematic manner.

1.1 Operational Definition and Key-Terms

1.1.1 Herbal Tea

Medicinal herbal tea refers to a tea made from herbs that are believed to have medicinal properties and are used for their therapeutic benefits. Herbal teas have been

used for centuries to treat a variety of health conditions and promote overall wellness (Craig, 1999).

The herbs used in medicinal herbal tea can vary and each herb is believed to have specific health benefits. For example, chamomile is often used for its calming properties, while ginger is believed to aid digestion and alleviate nausea. Echinacea is another herb commonly used in herbal tea blends and is believed to help boost the immune system. Herbal teas can be brewed from fresh or dried herbs, or they can be purchased in pre-made tea bags or loose leaf form. It's important to note that while herbal teas can provide health benefits, they should not be relied upon as a substitute for medical treatment. It's best to talk to a healthcare professional before using herbal tea as a treatment for any health condition.

1.1.2 Tea Health Benefit

Tea health benefits refer to the positive effects that drinking tea can have on various aspects of health and wellbeing. Tea contains a variety of beneficial compounds such as polyphenols, flavonoids, and antioxidants that have been linked to various health benefits. Tea health benefits can include improved heart health, reduced risk of chronic diseases such as cancer and diabetes, improved brain function, weight management, immune system support, and stress reduction. However, it's important to note that the exact health benefits of tea may vary depending on the type of tea, the amount consumed, and other individual factors. While tea can provide health benefits, it is not a cure-all and should not be relied upon as a sole means of maintaining good health. It is best to enjoy tea as part of a healthy and balanced diet and lifestyle.

1.1.3 Ten Herbal Tea

I have been selected 10 popular herbal teas and their potential health benefits:

1. **Chamomile tea:** Chamomile is often used for its calming properties and may help improve sleep quality and reduce anxiety.
2. **Peppermint tea:** Peppermint is believed to aid digestion and relieve bloating, nausea, and other digestive symptoms.

3. **Ginger tea:** Ginger is a natural anti-inflammatory and is often used to relieve nausea, improve digestion, and reduce inflammation.
4. **Rooibos tea:** Rooibos is rich in antioxidants and may help support heart health and reduce inflammation.
5. **Hibiscus tea:** Hibiscus is rich in vitamin C and antioxidants and may help lower blood pressure and support healthy cholesterol levels.
6. **Lemon balm tea:** Lemon balm is believed to have calming properties and may help reduce anxiety and improve sleep quality.
7. **Echinacea tea:** Echinacea is believed to support the immune system and may help reduce the severity and duration of colds and other respiratory infections.
8. **Dandelion tea:** Dandelion is believed to have diuretic properties and may help reduce water retention and bloating.
9. **Sage tea:** Sage is believed to have anti-inflammatory properties and may help support brain function and improve memory.
10. **Turmeric tea:** Turmeric is a natural anti-inflammatory and may help reduce inflammation and pain, support heart health, and improve brain function.

Bangladeshi herbal tea is a type of tea that is made from various herbs and spices that are native to Bangladesh or commonly used in Bangladeshi cuisine. Some common ingredients in Bangladeshi herbal tea include chamomile, peppermint, ginger, hibiscus, turmeric, and black pepper. These herbs and spices are known for their various health benefits and are often used in traditional medicine practices in Bangladesh. Bangladeshi herbal tea is typically brewed by steeping the herbs and spices in boiling water and may be consumed hot or cold. It is often enjoyed as a refreshing beverage or as a home remedy for various ailments.



CHAPTER 2

Objective of the Study

2.0 Scope of the Study

The purpose of the study was to evaluate the potential health benefits of herbal formulations comprised of herbal teas such as blue, hibiscus, rose, tulshi(*Ocimum sanctum*), jasmine, ginseng, rosemary, peppermint, ginger, and others that contain phytochemicals and to contribute to the development of herbal tea. To determine the numerous publications included in the study, an examination of each herb sample's herbal herbs was undertaken. As part of nutritional analysis, data were collected from the same literature about the moisture content, ash content, and mineral composition of the herbal formulation mixture. The justification for the herbal profile study shown that the formulation blend of herbs leaves, stems, and fruits is a good source of nutritional health with high therapeutic value. In the study, huge health advantages associated with the use of herbal or green tea and mental health revitalize were also emphasized. To enhance their health, the low-income group stands to gain the most from this. So, the aforementioned herbal infusion can be utilized as a healthier substitute for flavorful teas that also provide health benefits.

2.0.1 Objectives of the Study

To determine the health benefits of herbal tea and ten selected tea effectives for human body. One very frequent consuming technique is to map the tea medicinal plant for herbs leaves, stems, and fruits processing and evaluate the consuming step, I defined specific objectives is bellow:

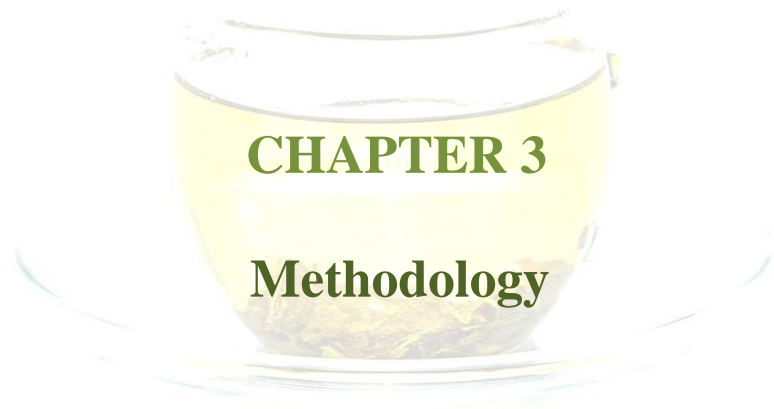
2.0.2 Specific Objectives

1. To understand the herbal tea consumed regarding health benefit for Bangladeshi population.
2. To explore the significant factors of herbal tea that impacted concerning side effect on human health.
3. To analyze the health benefit of selected ten herbal teas componential availability in Bangladesh.
4. To suggest based on findings and its solution according herbal tea for health benefits.

2.0.3 Significance of the Study

Herbal tea is among the most popular beverages due to its palatable flavor and supposed health benefits. Although tea intake has been associated with health advantages since its inception, scientific examination of this beverage and its ingredients dates back only around 30 years. Intake of herbal tea, particularly green tea has been associated with a reduced risk of chronic pathologies such as cancer and cardiovascular disease in which oxidative stress has been implicated.

The health advantages attributed to tea consumption may be attributable to the high concentration of bioactive compounds such as polyphenols. Antioxidant, antiviral, and anti-inflammatory properties have been attributed to polyphenols, which also control detoxification enzymes, increase immunological function, and reduce platelet aggregation. Consequently, we sought to determine the relevance of the health benefits of herbal tea using a systematic literature review. Importance of the project is that herbal tea consumption appears to improve the human health profiles of individuals at lower risk.



3.0 Methodology

In this study, systematically medicinal herbs based design was used so that the human health benefit of ten selected herbal tea (chamomile, peppermint, ginger, rooibos, hibiscus, lemon balm, echinacea, dandelion, sage and turmeric). This was done through related article and a study based on tea herbs.

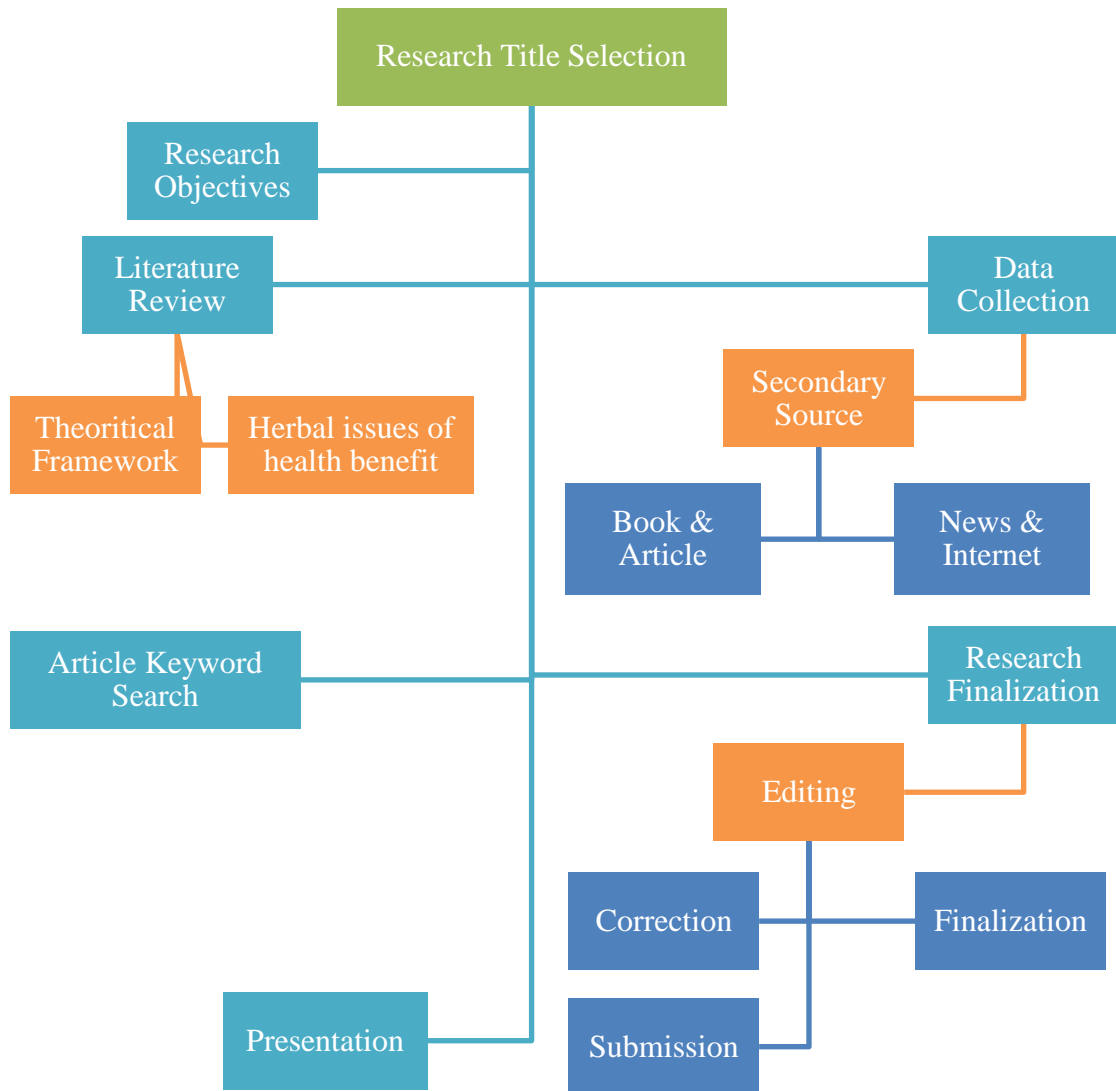


Figure 2: Project Design

[Source: Self-creation (2023)]

3.1 Data Sources

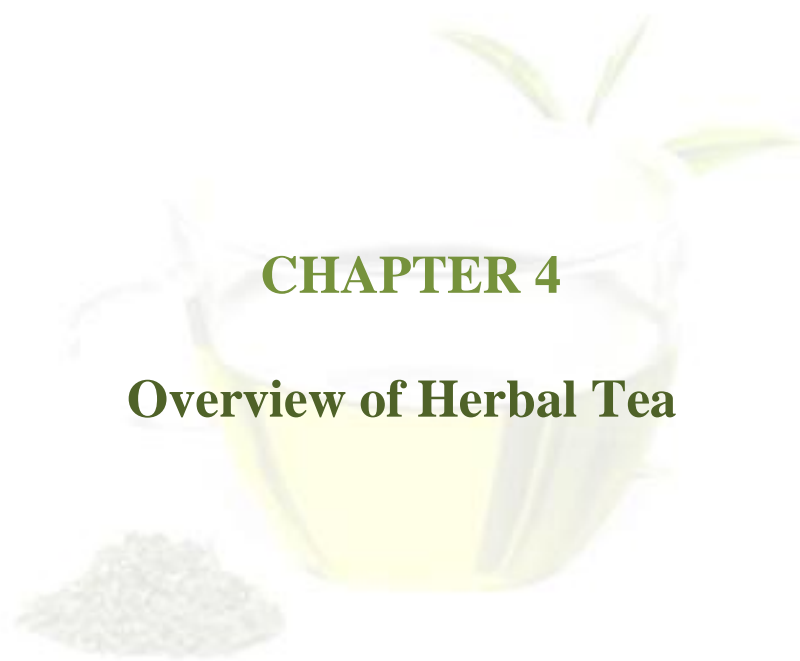
In this study secondary data has been used (Syed, 2012)

Secondary Data: secondary data has been collected from the following sources;

- Related books
- Article of journal
- Newspaper
- Weekly and monthly magazine
- Government report
- Non-government report
- Internet source

3.2 Methodological Limitation

The study has so many limitations as well as many of the no available publication on herbal tea. The researcher found it difficult to health benefited issues on herbal tea consumption and data sets from. Another drawback of this study was its short duration.



CHAPTER 4

Overview of Herbal Tea

4.0 Introduction

Books, papers, and articles on the health benefits of herbal tea of Bangladesh in particular have been written by academics in the fields of food and health as well as authors and columnists who write about these topics. In this chapter, I would like to conduct a literature determination on the chamomile, peppermint, ginger, rooibos, hibiscus, lemon balm, echinacea, dandelion, sage and turmeric herbal teas in Bangladesh as well as the medicinal practice on drinking with a particular emphasis on health benefited.

4.1 History of Herbal Tea

ShenNung, the second emperor of China, is supposed to have discovered tea when a *Camellia sinensis* leaf blew into his cup of boiling water (2737 BCE). Father Jasper de Cruz, a Portuguese Jesuit missionary, was the first European to experience tea and write about it in 1560. About 1650, the Dutch introduced many teas and tea traditions to New Amsterdam (which later became New York). In 1657, Garway's Coffee Shop in London, England, sold the first tea sold as a health beverage. The first retail tea in sealed, lead-lined containers was introduced by John Horniman in 1826 (Van Wyk & Gorelik, 2017). In 1870, Twinings of England began blending tea for consistency. The Englishman Richard Blechynden introduced iced tea during a heat wave at the 1904 St. Louis World's Fair, while the New York tea importer Thomas Sullivan accidentally invented tea bags in 1908 when he shipped tea to clients in small silk bags and they incorrectly steeped the entire bags. In 1953, the first instant tea was presented to the world (Stander et al., 2019).

4.2 Regular and Herbal Tea Consumption: International Context

Throughout the eighteenth century, tea was one of the most important commodities in the Eurasian trade, traveling from Guangzhou in China to cities like Gothenburg and Copenhagen before spreading to Europe (Charrier et al., 2002). About one-third of the tea imported from China to Europe in the eighteenth century onboard ships of the Danish Asiatic Company (DAC) and the Swedish East India Company (SEIG). In Northern Europe, where tea intake was mostly restricted to the social elite and coffee consumption was more prevalent than tea, tea consumption has traditionally been relatively low.

Black tea is the most popular form of tea offered in Sweden. In recent years, green tea has gained acceptance and popularity. The majority of Danish tea imports are from India, Sri Lanka, China, and, to a lesser extent, Japan. These imports include black, green, white, and oolong teas, as well as certain flavored teas with different flavors. In addition to regular teas, Denmark has a popular flower and fruit tea made from dried fruit and flower petals, which has been enjoyed for generations by the elderly, children, and women as a beauty product (Charrier et al., 2002).

They feel that green tea is a wonderful substance for preventing and curing cancer as a medical help. Green tea and herbal teas are frequently recommended by doctors. Plants with medical characteristics are used in medicinal tea, such as chamomile tea for stomach aches and linden flowers for fevers.

Table 1: Tea Consumption Per Capita

Country	Units	2007	2008	2009	2010	2011
Belgium	kg	0.3	0.34	0.28	0.19	0.2
Bulgaria	kg	0.05	0.08	0.45	0.09	0.11
Croatia	kg	0.03	0.03	0.03	0.04	0.04
Denmark	kg	0.32	0.33	0.3	0.32	0.3
Estonia	kg	0.5	0.5	0.46	0.5	0.42
Finland	kg	0.32	0.27	0.28	0.26	0.31
France	kg	0.48	0.39	0.31	0.27	0.27
Germany	kg	1.03	1.06	0.68	0.4	0.54
Greece	kg	0.13	0.12	0.16	0.28	0.4
Iceland	kg	0.57	0.5	0.51	0.48	0.47
Ireland	kg	2.1	2.19	3.34	2.23	1.88
Italy	kg	0.11	0.12	0.13	0.13	0.11
Latvia	kg	0.48	0.43	0.41	0.39	1.01
Luxembourg	kg	0.26	0.28	0.29	0.63	0.48
Malta	kg	1.28	1.08	1.62	2.04	2.24
Netherlands	kg	1.01	1.31	0.89	0.66	0.98
Norway	kg	0.31	0.32	0.31	0.3	0.29
Poland	kg	0.59	0.63	0.99	0.96	0.92

Country	Units	2007	2008	2009	2010	2011
Romania	kg	0.07	0.05	0.1	0.08	0.15
Spain	kg	0.34	0.12	0.09	0.09	0.11
Sweden	kg	0.45	0.47	0.46	0.45	0.41
World	kg	0.71	0.73	0.71	0.73	0.78

Ref: Szymczycha- Madeja et al. (2013)

4.3 Tea based Health and Lifestyle

More than 700 constituents make up tea, including polyphenols, amino acids, proteins, flavonols, flavonoids, organic acids, caffeine, carbohydrates, vitamins, alkaloids, aromatic compounds, pigments, and enzymes. Inorganic (3.5–7.0%) and organic (93–96.5%) compounds make up the chemical makeup of tea (Sueoka et al., 2001). Potassium, Magnesium, Manganese, Fluorine, Calcium, Sodium, Sulfur, Iron, Copper, Silicon, Zinc, Selenium, and other minerals are present in tea.

Table 2: Tea ingredients and health advantages

Ingredients in tea and benefits to the body	
Contents	Potential health effects
Potassium	Keeping body fluids balanced
Magnesium	Maintain normal glucose metabolism
Manganese	Maintaining bones
Fluorine	Protects teeth
Calcium	Helps bone development
Sodium	Balancing body fluids
Sulfur	Has an antidiarrheal effect
Iron	involved in the synthesis of haemoglobin
Copper	Prevention of anaemia
Silicon	Improve bone development
Zinc	Improve growth and development
Selenium	Boosting immunity
Nickel	Maintain normal metabolism
Polyphenols	Lowering blood lipids, antioxidants and preventing cancer.
Flavonoid	Anti-inflammatory, antibacterial and antiviral

Ref:Maeda-Yamamoto (2013)

Ingredients in tea and benefits to the body	
Contents	Potential health effects
Caffeine	Reduces tiredness and refreshes
Polysaccharid	Strengthening the body's immune system
Cellulose	Regulating the micro-ecology of the intestinal tract
Vitamin B	Maintains a healthy digestive system and skin
Vitamin C	Detoxification, Beauty
Vitamin E	Anti-oxidant/anti-ageing

Ref:Maeda-Yamamoto (2013)

Catechins, that are specific to tea and have an acrid and astringent flavor, are the first group of necessary elements of tea and their functions. Additionally, it can be combined with caffeine to reduce its metabolic effects on the body. Catechins have antioxidant, antitumor, blood cholesterol-lowering, and blood pneumatically effects, as well as antibacterial properties. The middle group is caffeine, which has a revitalizing effect and is the primary flavor component of tea broth. Minerals make up the final category. Minerals aid in maintaining the alkalinity of body fluids and maintaining health. The fourth group is vitamins that the body needs, such as vitamins B, C, and D (Deka & Vita, 2011).

4.4 Lifestyle-related Tea Drinking Habits

In the Netherlands, Japan, Austria, and the United States, tea intake was positively linked to a greater amount of education and healthful lifestyles, but the results were dissimilar in Wales and Scotland. When using observational studies to look into the impact of tea on health, it is crucial to account for the potential confounding effects of other nutritional and lifestyle factors(Sato et al., 1989).

Sato et al. (1989) more studies on numerous prospective cohort in Asian populations have demonstrated a negative association between regular tea consumption and cardiovascular disease risk and total mortality. The same association has not, however, been observed in studies conducted in Western nations and among multicultural populations. Given this contentious situation, it is still unclear whether regular tea consumption can be regarded a healthy lifestyle.

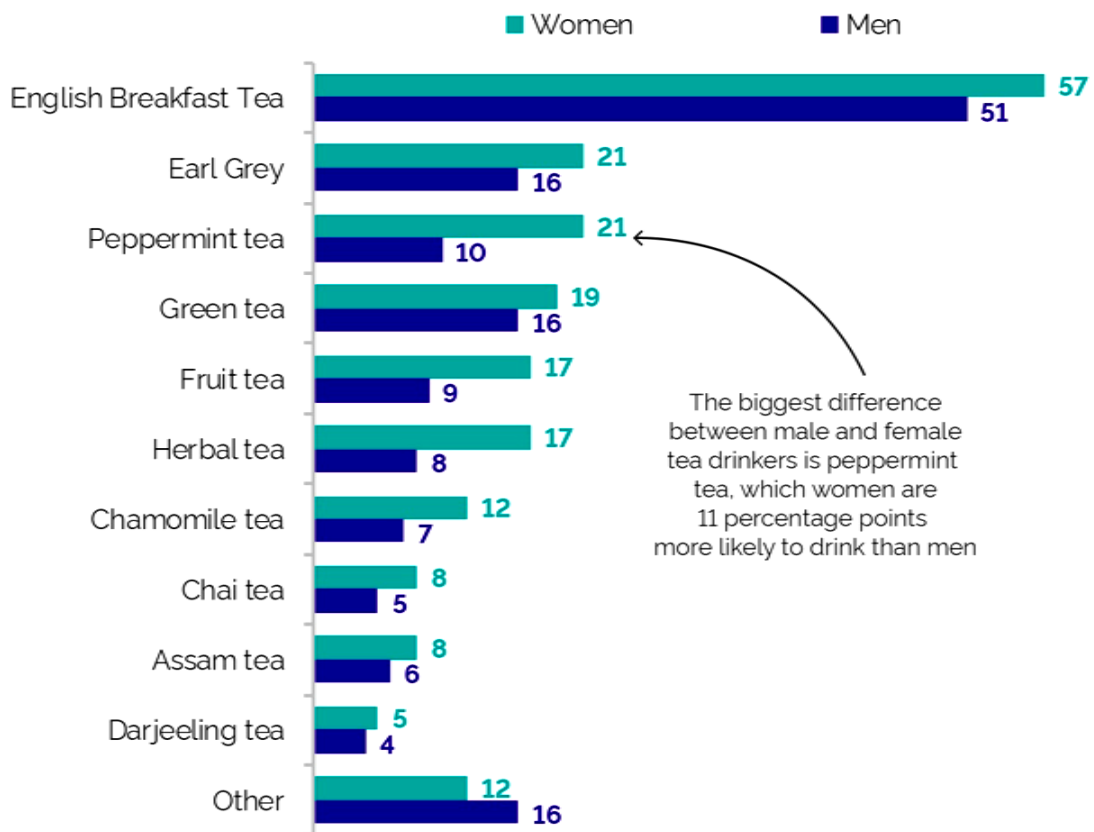


Figure 3: Tea Habits in the World

[Ref:(Sato et al., 1989)]

The chemical nature of the numerous nutrients in tea is progressively being revealed. After all, everything has two aspects. Only through a thorough comprehension and empirical application of all these active constituents can the health-promoting properties of tea be fully realized.

4.5 Tea and Complementary and Alternative Medicine

Complementary and alternative medicine (CAM) refers to non-standard medical products and procedures. Complementary medical systems are a broad category that incorporates complete systems of thought and practice that have developed independently of conventional medicine. CAM models are divided into five categories by the National Center for Complementary and Alternative Medicine of the National Institutes of Health. CAM is defined as "a diverse set of medical and health care systems, practices, and goods that are not currently considered part of conventional medicine." Alternative medical systems are enumerated first, followed by mind-body approaches, physiologically based treatments, manual and body-based

tactics, and energy techniques (Molassiotis et al., 2005). The third of these categories is bio-based treatments, which include particular diets, herbal products, and other natural substances such as nutrients, keratin, and biologics.

4.6 Diving into the Bangladesh of Herbal Tea Marketing

Herbal tea is an infusion or mélange of different leaves, fruits, flowers, or roots of palatable, non-tea plants with black, green, or white tea as the base. There is a wide variety of infusions available at local stores and supermarkets today (Saha et al., 2021).

4.6.1 Kazi & Kazi Tea

Kazi and Kazi Tea estate, also known as K&K, produces a variety of affordable organic tea varieties for both domestic and international markets. For novices who might be intimidated by the bitterness of organic tea, K&K's Green Tea is an excellent option because it is easy on the palate. It has a fresh, grassy flavor, a delightful aroma, and a slight acidic undertone. Jasmine Green Tea is the "public favorite" flavor from K&K (*Green Tea of Kazi, 2023*).



Figure 4: Herbal tea of Kazi&Kazi in Bangladesh

[(Ref:www.google.com)]

Green Lemongrass Tea from K&K, which has a lovely and calming lemongrass aroma, is another light herbal tea. Add a sprinkle of lemon juice and drink it without sugar, and you have the ideal midday tea. Consider K&K's newest offering, the Green

Mint Tea, which features an earthy undertone with a hint of mint and comes in a very upscale package. K&K Tea comes in packets of 40 tea sachets with prices ranging from Tk170 to Tk300 (Nibir et al., 2017).

4.6.2 Hamdard Herbal Tea

One of the healthiest methods to manage weight but also adjust metabolism is Hamdard Fit and Lite Tea. Hamdard Tea aids weight loss without creating severe adverse effects thanks to several herbal beneficial components (Hamdad, 2023). With the Hamdard Fit & Lite Tea, Consumer can live smartly and lose weight the correct way.

4.6.3 Tulsi Pati

TulsiPati's packaging features enticing artwork and offers a delectable selection of herbal beverages. TulsiPati offers a distinct blend of Lemon Ginger Tea in addition to its signature Green Tea, with an overwhelming lemon aroma and a hint of ginger spice. Sweet, light, and palate-pleasing describe this tea (“Tulsi Pati Green Tea,” 2023).



Figure 5: Branding Lemon Ginger tea in Bangladesh

[Ref: “TulsiPati Green Tea, (2023)"]

Halda Valley's Silver Needle White Tea represents the only white tea manufactured by a local tea estate and is regarded as a rare and valuable tea. These teas are available from Halda Valley for Tk105 for six sachets. Consider visiting the aesthetically appealing Halda Valley Tea Lounge on Gulshan Avenue for a soulful and tranquil journey with their entirely separate tea menu.

Tetley: Tired of the simple flavor of Green Tea? Tetley, however, has made it possible for you to experiment with some intriguing Green tea infusions. Green Tea with Lemon & Honey and Green Tea with Masala are two of the brand's unique varieties, in addition to the Original Green Tea. In addition to Green teas, Tetley also offers a soothing Lemon & Honey Tea that boasts a flavor profile of lemon balm and honey. A excellent addition to your tea cabinet is the brand's Masala Tea. You can purchase a pack of 25 packets of these flavors for about Tk150 (*Tetley Green Tea Bag- Lemon & Honey*, 2023).

Tea Consumption in Bangladesh

Tea cultivation in Bangladesh started during British rule. Although Sylhet division is currently the most famous for tea cultivation. However, the first initiative for tea cultivation in Bangladesh was taken in Chittagong, the country's port city, between 1828 and 1840. As both attempts failed, in 1854, or to popular belief in 1847, the first commercial tea garden of Bangladesh, 'Malnichhara Tea Garden' was established near current Airport Road in Sylhet (Saha et al., 2021).

Tea is the second largest cash crop in Bangladesh after jute. From breakfast to evening chat, tea has been a favorite drink of this country's people all day long. Apart from Bangladesh, tea is most prevalent in countries like India, China, Japan, and the United Kingdom. Due to this, tea has been produced in Bangladesh for more than 180 years. At present, there are 167 commercial Tea Production Estates and Tea Gardens on 2,79,507.88 acres of land in Bangladesh, employing about 1.5 lakh workers. In addition, 3% of global tea is produced in Bangladesh. In 2021, the market size of the tea industry in Bangladesh was about BDT 3500 crore. Currently, there are five types of tea produced in Bangladesh: Green Tea, Black Tea, Oolong Tea, Instant Tea, and White Tea (Maeda-Yamamoto, 2013).

4.6.5 Rising Domestic Tea Consumption

During British rule, tea was first grown in Bangladesh. Despite the fact that the Sylhet division is presently the most well-known for growing tea. But between 1828 and 1840, Chittagong, the country's port city, saw the first tea growing initiative in Bangladesh. The first commercial tea garden in Bangladesh, the Malnichhara Tea Garden, was developed close to what is now Airport Road in Sylhet in 1854, or according to conventional belief, in 1847, as both attempts failed (*The Most Beautiful Tea Gardens in Bangladesh to Visit*, 2021).

After jute, tea is Bangladesh's second-largest monetary crop. Tea has been a favored beverage of the people of this country all day, from breakfast to late conversation. Tea is most popular in places like India, China, Japan, and the Great Britain, in addition to Bangladesh. As a result, Bangladesh has produced tea for more than 180 years. There are currently 167 commercial Tea Producing Estates and Tea Gardens in Bangladesh, employing approximately 1.5 lakh people. Furthermore, Bangladesh produces 3% of the world's tea. Bangladesh's tea industry had a market size of approximately BDT 3,500 billion in 2021 (*Sreemangal Tea Gardens*, 2023). Bangladesh currently produces five different varieties of tea: Green Tea, Black Tea, Oolong Tea, Instant Tea, and White Tea.

4.6.6 Government Pushing for Rising Export

The Bangladeshi government intends to increase production by 46% to 14 billion kilograms by 2025, according to Halder (2023). After satisfying domestic demand, it is still difficult to export tea overseas. The production and export of tea are, however, being increased. The owners of tea estates and tea plantations should also step forward, and the Bangladesh government will provide all necessary assistance. Bangladesh Tea Board that in addition to proper promotion for the growth of the tea industry, the Bangladeshi government is continuously striving to set up new tea gardens, develop new tea varieties, and guarantee fair prices. The estimated local tea demand in Bangladesh by 2025 is approximately 13 lakhs (12,900,000,000) kg. If 14 crores kg of tea can be produced, one crore kg of tea can be exported after meeting domestic demand (Halder, 2023).

4.6.7 Flavor

Bangladeshi consumers enjoy drinking milk tea, liqueur tea, and uncooked tea. From small wayside tea shops to large restaurants, these two varieties of tea are consumed most frequently. However, these tea shops are utilizing additional ingredients such as Spice, Ginger, Cinnamon, Basil, and Lemon Leaves to lend a unique flavor to the tea based on the consumer's taste. As a consequence, consumers are selecting various tea flavors.

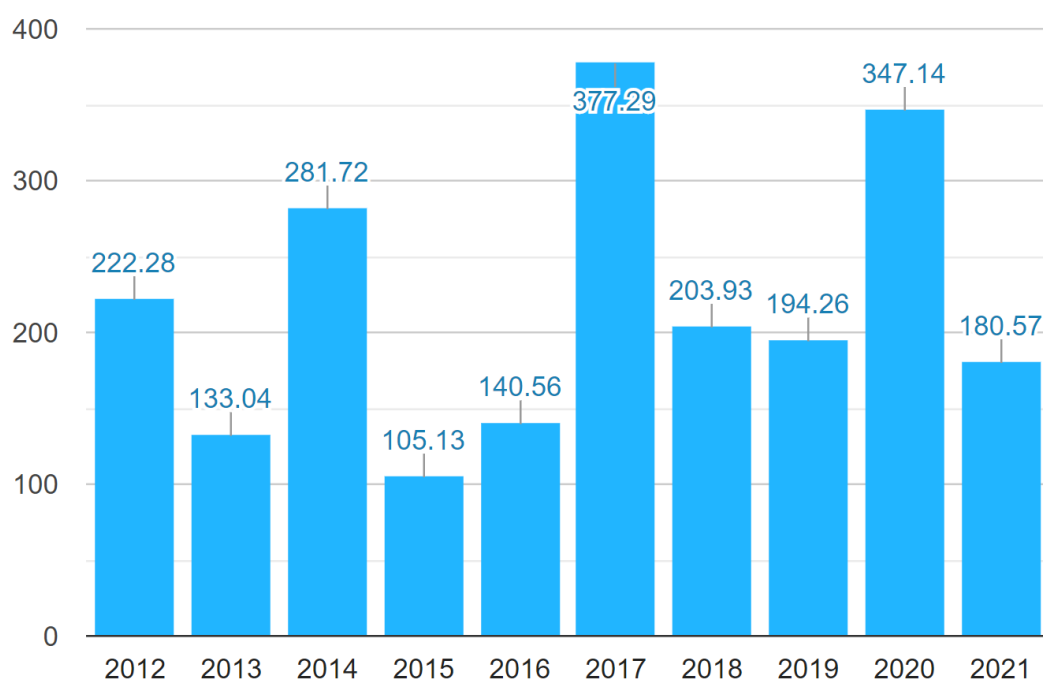
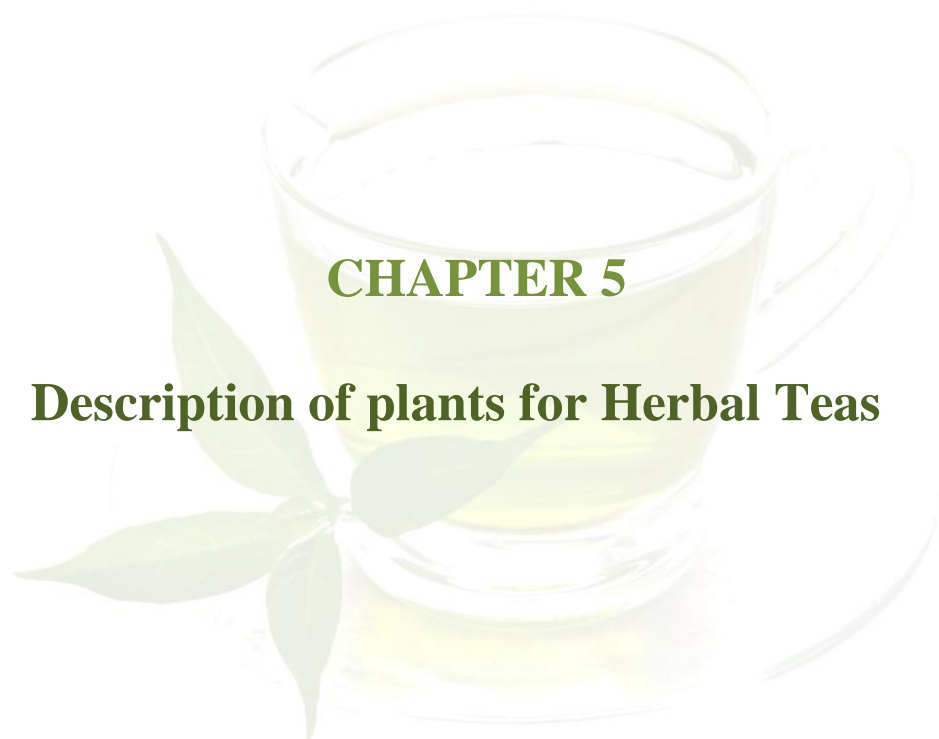


Figure 7: Export Value of Tea from Bangladesh 2012-2021 (in Million BDT)

[Ref: Hossan, (2022)]

The major tea manufacturers in the nation have also developed a variety of tea flavors in consideration of consumer preferences. By combining and refining other ingredients with regular tea, brands also introduce new flavors. Black Tea, Lemon Tea, Green Tea, Ginger Tea, Iced Tea, Tulsi Tea, Masala Tea, Amloki Tea, Triphala Tea, Caffeine & Non-Caffeine Tea and many more such new variants are available from brands such as Kazi & Kazi, Ispahani and Fresh.



CHAPTER 5

Description of plants for Herbal Teas

5.0 Introduction

The systematic evaluations discussed in the chapter on ten herbal teas cover all aspects of the herb's description and its medicinal value. A mapping review categorizes extant literature on the health benefits of herbal tea. The method identifies the quantity and quality of literature, including an overview of botanicals. Mapping evaluations can be used to determine whether primary or secondary sources are necessary. Additionally, the journal seeks to publish the results of all well-conducted systematic reviews, regardless of their summary.

5.1 Chamomile Herbal Tea

Chamomile has been used for medical uses for thousands of years and is still one of the most popular herbal remedies. It is most commonly ingested as an herbal tea, but it can also be taken orally in the form of drops, capsules, or pills, applied topically, or inhaled. Chamomile has been used to treat mild gastrointestinal issues, cold symptoms, tiny ulcers, surface wounds, small boils, mouth, throat, and skin irritation, anxiety, and sleeplessness, among other ailments and illnesses (Chen, 2002). Chamomile's antiinflammatory, antioxidant, antibacterial, antinociceptive, analgesic, anxiolytic, sedative, and antispasmodic characteristics contribute to its efficacy. Terpenoids such as chamazulene and bisabolol, as well as flavonoids such as apigenin, luteolin, and quercetin, are the most prominent ingredients contributing to chamomile's therapeutic benefits (Chen, 2002).

The family Asteraceae includes the annual or perennial plant known as chamomile. The plant increases appetite and reduces painful swellings and sweating. Chamomile is a flower that is native to temperate regions of Asia and Europe, and it is grown all over the world for its medicinal, cosmetic, and gastronomic value. It has been used for a very long time in Greece, Rome, and Egypt. In Chinese medicine, the specific application of this plant was first documented. Other traditional, homoeopathic, and Unani medicines also use the plant. *Matricariachamomilia* L. (MC) and *Anthemisnobilis* are the two main types of chamomile (L.) It is an annual plant, and in China, it blooms from May to July. *Chamaemelumnobile* (L.) All is a perennial plant in the genus *Chamaemelum* (Nikolić & Stevović, 2015). In China, the blossoming season lasts from April to May. *Matricaria chamomile* L. is a common plant that has

been studied and used extensively. At the moment, this plant is used as medicine in 26 countries around the world (Khan et al., 2021).

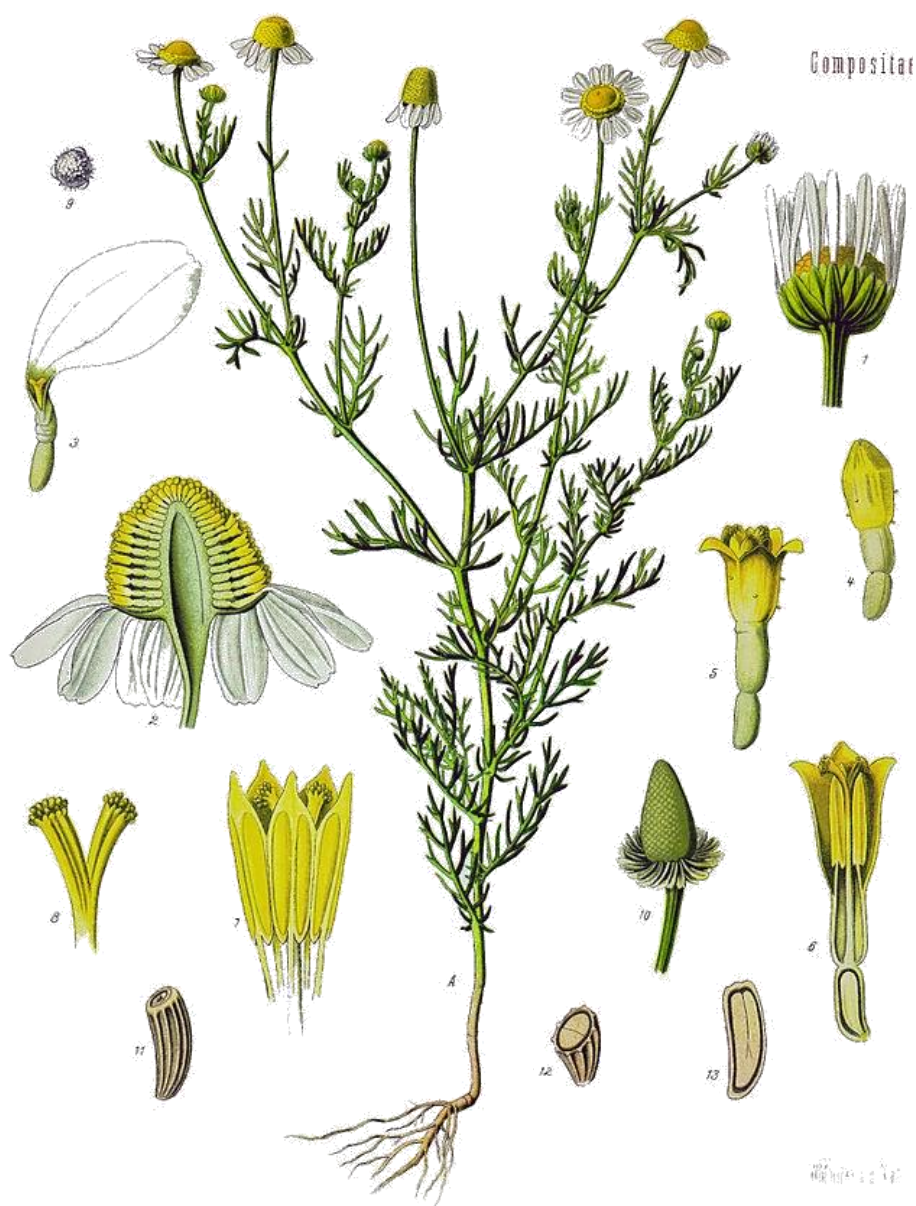


Figure 8: Chamomile Leaves, stems and shrubs

[Ref: Khan et al. (2021)]

Chamomile flower heads are commonly used for medicinal purposes. Chamomile contains flavonoids, coumarins, volatile oils, terpenes, sterols, organic acids, and polysaccharides, among other compounds. Having a wide array of compounds, chamomile exhibits various pharmacological activities such as anticancer, anti-infective, anti-inflammatory, antioxidant, hypoglycaemic, hypotensive,

hypolipidaemic, antiallergic, antidepressant, and neuroprotective effects and others. In general, this plant has outstanding research value. Still, there are very few reviews of it in the literature. This article provides a comprehensive review of the botanical characteristics and distribution, traditional uses(Sharma & Ranganathan, 1985), chemical constituents, pharmacological effects, and quality control methods of chamomile(Barreda et al., 2012).

Table 3: Chamomile species derivation

Common name	German chamomile	Roman chamomile	oxeye daisy	fleabane
Accepted name	Matricaria chamomilla	cnamaemelumobile	Leucanthemum vulgare	Erigeron sp.
Older names	Matricariarecutita	Antnemisnobilis	Chrysanthemum leucanthemum	Erigeron annuus and E. strigosus are common species)
Leaf type on stem	finely dissected into small, long narrow lobes, fern-like	finely dissected into small, long narrow lobes, fern-like	simple, whole leaves wider towards the apex, edges with irregular teeth, leaves clasping stem	whole, lance-shaped to oblong, with serrate edge
Flower heads per plant	ca. 8-120 per plant, stem heavily branched	ca. 3-20 per plant, branches many	ca. 1-10, branches few and flower heads long-stalked	5-50+ per plant, branches many
Number of white ray flowers per head	ca. (10-)14-26	ca. 13-21	ca. 13-34	ca. 80-125, very thin and narrow

Ray (white) flowers on old flower heads	bending down under the flower head	bending down under the flower head	spread outwards, horizontal, sometimes downwards (wilted look)	spread outwards, horizontal, or coiling upwards
Yellow center in middle of flower head	raised like a dome	raised like a dome	flat or sunken inwards	flat or slightly dome-shaped, often slightly sunken in center

[Ref: Barreda et al. (2012)]

Chamomile is a medicinal plant that has been used for centuries to treat various ailments due to its numerous beneficial properties. One of its properties is its organoprotective effect, which refers to its ability to protect the body's organs from damage or injury (Chang & Chen, 2016).

5.2 Peppermint

Peppermint is one of the most commonly used botanicals in modern society. Peppermint is a summer-growing, perennial aromatic herb that is a cross between *Menthaspicata* (spearmint) and *M. aquatica*. (watermint). The plant is believed to have originated in the Mediterranean and grows in moist areas throughout Europe and North America in the wild (Herro & Jacob, 2010). The volatile compounds in the leaves and stems of peppermint give the plant its pungent aroma and flavor. The oil includes menthol, which is responsible for peppermint's characteristic cooling sensation.



Figure 9: Peppermint Medicinal Plants

[Ref: Riachi & De Maria (2015)]

The genus *Mentha* was named after the Greek nymph Minthe. When Pluto's wife heard of the affair, she murdered Minthe in a fit of rage and jealousy. In remembrance of Minthe, Pluto brought her back to life as a fragrant plant (Zheljaskov & Nielsen, 1996). The name peppermint is from the species name *piperita* meaning "peppery," which distinguishes peppermint from other forms of mint.

Mentha derives its name from the Greek goddess Minthe. In a fit of fury and jealousy, Pluto's wife murdered Minthe after learning of her husband's affair. Pluto brought Minthe back to life as an aromatic plant in her memory. The word "peppery" is derived from the species name *piperita*, which distinguishes peppermint from other

types of mint. The Roman scientist Pliny the Elder (circa 23-79 CE) wrote that Greeks and Romans used peppermint to decorate themselves and banquet tables, and to flavor wine and condiments. There is evidence that Egyptians cultivated *M. x piperita*, and it appears in Icelandic medical documents from the 13th century (Burbott & Loomis, 1967). However, it was not utilized medicinally in Europe until the middle of the eighteenth century.

Table 4: The list of the most abundant mint species and their functions

Species	Usage
<i>Menthaspicata L.</i>	Medicine
<i>Menthasuaveolens</i>	Ornamental Consumption
<i>Mentharequienii Benth.</i>	Ornamental Consumption
<i>Menthapulegium L.</i>	Medicine
<i>Menthapiperita L.</i>	Medicine, Ornamental consumption, commercial
<i>Menthacitrato Ehrh</i>	Medicine
<i>Mentha Ion gif alia L</i>	Medicine, Commercial
<i>Menthacordiaca</i>	Medicine
<i>Menthaorvensis</i>	Medicine
<i>Menthacanadensis</i>	Weed
<i>Menthaflavouring</i>	Ornamental consumption, Medicine

[Ref: (Heidari-Beni et al., 2020)]

5.3 Ginger as Herbs

Ginger (*Zingiber officinale* Roscoe) is a member of the Zingiberaceae family and the Zingiber genus. Other names for ginger include African ginger, Black ginger, Cochin ginger, GanJiang, Gegibre, Ingwer, Jamaican ginger, and Race ginger. Turmeric, cardamom, and galangal are other notable members of the ginger family (Grzanna et al., 2005). The genus contains approximately 85 species of aromatic vegetation from East Asia and tropical Australia. Ginger is a perennial plant that grows between one and three feet in height. The stem rises approximately 12 inches above the soil and is surrounded by the wrapping bases of the two-ranked leaves. It produces clusters of white and pink flower blooms that open to reveal yellow blossoms. Rhizome is a configuration in which ginger grows horizontally, laterally compressed with branching segments. The entire rhizome is robust and

striated. It is 5 to 15 centimeters long, 1.5 to 6 cm wide, and 2 cm thick, and relying on the variety, can be yellow, white, or scarlet(Heidari-Beni et al., 2020).

Ginger's health benefits were first discovered in the ninth century in Germany and France, and in the tenth century in England. One pound of ginger was worth the same as a sheep in England during the 13th and 14th centuries, according to records. By the time of the Greeks and Romans, ginger had moved westward to Europe. Nearly 2,000 years ago, the Romans imported ginger from China, according to history. Ginger looks like fingers, so pregnant women in China are told to stay away from it. If they do, their babies might have more than five fingers(Heidari-Beni et al., 2020). But after giving birth, a woman can take it for strength, to get rid of any poison in her body, and to protect the baby.



Figure 10: Medicinal fraction of Ginger

[Ref: Wilkinson, (2000)]

5.4 Rooibos Herbs

Rooibos meaning ‘red bush’ with the scientific name of *Aspalathus linearis* is a broom-like member of the legume family of plants growing in South Africa’s fynbos. The generic name of the Rooibos tea plant comes from the plant *Calicotome villosa*, *aspalathos* in Greek (McKay & Blumberg, 2007). This plant has very similar growth and flowers to the Rooibos plant. The specific name *linearis* comes from the plant’s linear growing structure and needle-like leaves. The leaves are used to make a tea called Rooibos, bush tea (esp. Southern Africa), or simply rooibos. The product has been popular in Southern Africa for generations and is now consumed in many countries.



Figure 11: Rooibos Herbs

[Ref: (McKay & Blumberg, 2007)]

5.5 Hibiscus

Hibiscus cannabinus is a prevalent natural plant in the majority of African nations south of the Sahara. It was cultivated as a fiber plant in Sudan 6,000 years ago. Kenaf is now common throughout the tropics and subtropics. In Africa, it is cultivated on a large scale as a vegetable, but on a much lesser scale as a fiber crop. In the past, it was a commercially significant crop in Côte d’Ivoire, Burkina Faso, Togo, Benin, Niger, Kenya, Tanzania, and Malawi. India has been the main producer of kenaf for a very long time (Da-Costa-Rocha et al., 2014). *H. sabdariffa* is indigenous to Africa. Roselle is now widespread in the tropics. It is particularly prevalent in the savanna regions of West and Central Africa.

Table 5: Therapeutic Potential of Hibiscus Rosa Sinensis: A Review

Super division:	Spermatophyta-Seed plants
Division:	Magnoliophyta-Flowering plants
Class:	Magnoliopsida-Dicotyledons
Subclass:	Dilleniidae
Order:	Malvales
Family:	Malvaceae-Mallow family
Genus:	Hibiscus L.-Rosemallow
Species:	Hibiscus rosasinensis L.-Shoeblackplant

[Ref: (Da-Costa-Rocha et al., 2014)]

Table12: Taxonomy and common name of Hibiscus rosasinensis

Taxonomy	
Name	Hibiscus rosasinensis
Family	Malvaceae
Common name in India	
Andhra Pradesh	Dusanna
Assamese	Jiwa, Joba
Bengali	Oru
Gujarati	Jasvua, Jasunt
Hindi	Guthur, Jassoon, Jasum, Jasund, Jasut, Java, Odhul

[Ref: (McKay & Blumberg, 2007)]

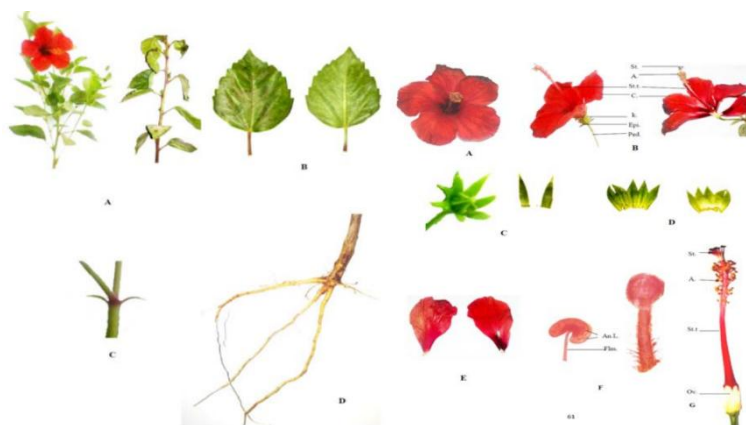


Figure 13: Hibiscus Herbs all part

[Ref: (Nunes et al., 2017)]

5.6 Lemon Balm

Lemon balm (*Melissa officinalis* L.) belongs to the mint family and it is indigenous of Southern Europe, Mediterranean region, Western Asia, and North Africa. Lemon balm is now cultivated worldwide. Currently in India lemon balm is cultivated in Kashmir, Utrakhand and some part of South India (Dastmalchi et al., 2008). There are two subspecies, *Melissa officinalis* subspecies *Melissa officinalis* the common cultivated lemon balm; and *Melissa officinalis* sub species *altissima*, naturalized in New Zealand and known as bush balm. Although *Melissa officinalis* subspecies *officinalis* known for its lemon fragrance. *Melissa* refers to honey or the honeybee because the plant is so attractive to bees and *officinalis* means a plant that is officially used in medicine.



Figure 14: Lemon balm medicinal part

[Ref: Scholey et al. (2014)]

Table 6: Botanical Overview

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Lamiales
Family	Lamiaceae
Genus	Melissa
Species	M. officinalis
Binominal name	Melissa officinalis

[Ref: (Scholey et al., 2014)]

5.7 Echinacea Herbs

Echinacea purpurea L. (EP), a member of the Asteraceae family, is one of the most significant medicinal herbs with vast pharmacological and cosmetic properties. In 2005, products derived from the aforementioned plant were ranked among the most popular botanical supplements in the United States (Percival, 2000). The North Americans used the plant's roots and underground stems to cure trauma and reduce infection and inflammation symptoms. During the clinical trial phases, it was determined that the EP possessed beneficial immunoregulatory, anti-inflammatory, and antioxidant properties, with neither hypersensitivity symptoms nor side effects (Yamada et al., 2011). Important plant constituents include caffeic acid derivatives, alkamides, flavonoids, lavender oil, and polyacetylenes. Caffeic acid compounds and alkamides have been demonstrated to have immunoregulatory effects. It was discovered that caffeic acid derivatives, alkamides, and polysaccharide fractions inhibit in vitro Cu(II)-catalyzed oxidation of human low-density lipoprotein (LDL), indicating the presence of antioxidant properties. The plant is cultivated primarily for its ornamental value as a result of its beautiful blossoms. Adults who are sensitive to plants in the daisy family typically experience an allergic reaction. Activation of autoimmune disorders such as lupus and collagen disease are additional adverse effects. It was determined that Echinacea is safe for oral and topical use, with the exception of patients who are allergic to it (Freeman & Spelman, 2008).

Echinacea purpurea belongs to the sunflower family and is a 1.56 dm (0.52 ft) tall perennial herb with a woody rhizome or fibrous caudex. The plant has mostly

unbranched, tough hairy stems. The leaf blades of the basal and lower cauline leaves are ovate to ovatelanceolate with serrate margins, up to 2 cm long and 1.5 cm broad, and faintly heartshaped at the base(Lee, 2010). Cauline leaves are similar but diminish in size as they ascend the stem. The flower crowns resemble sunflowers, and the disk is up to 3.5 cm in diameter. The ligules of the drooping ray florets are 38 cm long and reddish-purple, lavender, or rarely pink. The disk florets are between 4.5 and 5.5 mm in length and are surrounded by rigid bracts. Flowers blossom between June and August(Catchpole et al., 2002). Yellow granules are pollen. The fruits are tiny, dark, four-angled achenes.

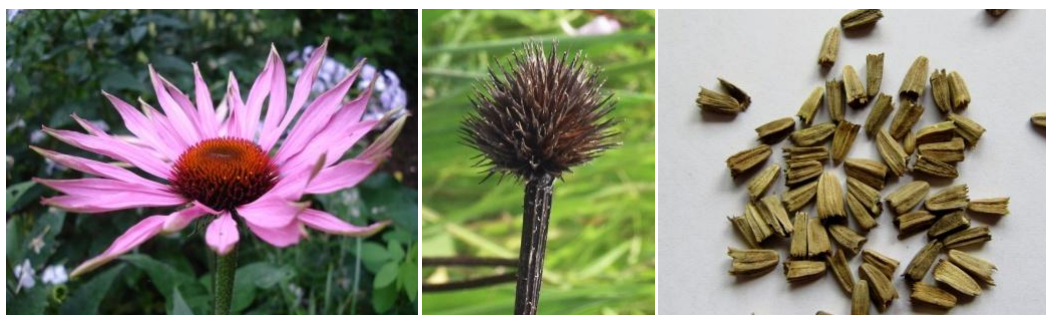


Figure 15: Echinacea Herbs Properties

[Ref: Rininger et al. (2000)]

5.8 Medicinal Herbs of Dandelion

The dandelion (*Taraxacumofficinale*), which is commonly viewed as a nuisance, is actually rather nutritious. It contains significant amounts of vitamins A, B, C, and D in addition to minerals like iron, potassium, and zinc. Salads, sandwiches, and drinks all benefit from the addition of dandelion leaves for extra taste(Lis&Olas, 2019). The blooms are fermented into alcohol, while the roots are utilized in coffee-alternatives.



Figure 16: Dandelion herbs element

[Ref: (Lis & Olas, 2019)]

Roots and leaves of the dandelion were traditionally used to cure liver ailments. Dandelion was used by Native Americans for the treatment of renal disease, edema, skin disorders, heartburn, and upset stomach by boiling it in water and then consuming it (Sweeney et al., 2005). Dandelion has been used to treat inflammation or a lack of milk production in the breasts, as well as stomach and appendix issues, in traditional Chinese medicine (TCM). Dandelion was utilized as a cure-all in Europe, where it was applied to everything from the common cold to diabetes and diarrhea.

Throughout the temperate regions of Europe, Asia, and North America, hundreds of different species of dandelion can be found. Hardy perennial dandelion can reach a height of almost 12 inches (Maliakal & Wanwimolruk, 2001). The plants feature glossy, hairless leaves that are deeply notched and toothed, like a spatula (Maliakal & Wanwimolruk, 2001). Flowers of a bright yellow color top dandelion stems. The rain collects at the base thanks to the grooved leaves. The dandelions bloom in the morning then close up again when the sun goes down or when it's cloudy outside. The

bitter, somewhat odorous white milky material inside the dark brown, meaty, and brittle roots.

5.9 Sage Medicinal Herb

A perennial with a three-foot height and summertime blue-violet flowers, sage goes by several popular names (Azevedo et al., 2011). *Salvia officinalis* was first cultivated in the region that is now part of Albania and Bosnia in southeastern Europe. More than half of the world's supply is still wild-collected (mainly in Albania, Bosnia and Herzegovina, Croatia, Montenegro and Serbia, and the United States), although it is now cultivated in some European countries (such as Albania, Bulgaria, Croatia, Germany, Poland, Romania, Montenegro and Serbia, and Spain) and the United States (Arceusz et al., 2013).

Sage leaves can be consumed in a variety of forms, including whole, powdered into a powder, extracted into a liquid extract, tincture, or essential oil, or freshly pressed for the juice. There are hundreds of species of *Salvia* that are not discussed in this profile yet are used in traditional medicine for a wide range of purposes in their native countries (Walch et al., 2012). The most well-known of these are the Mexican hallucinogen, *Salvia divinorum*, and the Chinese sage root, danshen (*S. miltiorrhiza*).



Figure 17: Sage Medicinal Herb

[Ref: (Azevedo et al., 2011)]

5.10 Turmeric Herbs

Turmeric is a plant that has a very long history of medicinal use, dating back nearly 4000 years. In Southeast Asia, turmeric is used not only as a principal spice but also as a component in religious ceremonies. Because of its brilliant yellow color, turmeric is also known as “Indian saffron”(R. U. Khan et al., 2012) Modern medicine has begun to recognize its importance, as indicated by the over 3000 publications dealing with turmeric that came out within the last 25 years. This review first discusses in vitro studies with turmeric, followed by animal studies, and finally studies carried out on humans; the safety and efficacy of turmeric are further addressed(Anubala et al., 2016).



Figure 18: Turmeric medicinal parts

[Ref: (Apak et al., 2006)]

Turmeric has been used as a culinary spice as well as having religious significance in India's Vedic civilization for about 4,000 years. By 700 AD, it had undoubtedly made it to China, by 800 AD to East Africa, by 1200 AD to West Africa, and by the 18th century AD to Jamaica (Zahid Ashraf et al., 2005). This spice was first reported by Marco Polo in 1280, who was amazed to see a vegetable with properties so close to

saffron. Turmeric has been used medicinally throughout South Asia for thousands of years, according to Sanskrit medical texts as well as Ayurveda and Unani traditions. In his Ayurveda Compendium, written around 250 B.C., Susruta suggests using a turmeric ointment to counteract the negative consequences of eating poison(Saputri et al., 2019).

India grows and uses almost all of the world's turmeric crop. Indian turmeric is regarded as the greatest in the world due to its natural properties and high level of the bioactive component curcumin. Erode, in the southern Indian state of Tamil Nadu, is the world's largest producer and most major trading center for turmeric. It is often referred to as "Yellow City," "Turmeric City," or "Textile City." In terms of scale and significance as a hub for the production and trade of turmeric, Sangli, a city in Maharashtra, is second only to erode (Saputri et al., 2019).

Turmeric contains turmerone in its volatile oil, and it also contains curcuminoids, which are coloring agents. Natural antioxidants known as curcuminoids include curcumin, demethoxycurcumin, 5'-methoxycurcumin, and dihydrocurcumin. In its typical form, turmeric comprises more than 9% water, 5.6% curcumin, 0.5%-3% mold, and volatile oils(Malik & Kumar, 2022). Turmerone, arturmerone, and zingiberene are the components that give turmeric its distinctive scent. Ukonans, stigmasterole, -sitosterole, cholesterol, and 2-hydroxymethyl anthraquinone are also said to be present in the rhizomes. Nutritional analysis revealed that 100 g of turmeric has 390 kcal, 10 g total fat, 3 g saturated fat, 0 mg cholesterol, 0.2 g calcium, 0.26 g phosphorous, 10 mg sodium, 2500 milligrams (mg, 47.5 mg iron, 0.9 mg thiamine, 0.19 mg riboflavin, 4.8 mg niacin, 50 mg ascorbic acid, 69.9 g carbohydrate content, 21 g dietary fiber, 3g (Priya et al., 2022).



CHAPTER 6

Result and Discussion

6.0 Result and Discussion

6.1 Ingredients of Herbal tea and it' Health benefit

6.1.1 Result

Tea contains more than 700 components, including tea polyphenols, aminoacids, proteins, flavonols, flavonoids, organic acids, caffeine, sugars, vitamins, alkaloids, aromatic substances, pigments, and enzymes. The chemical composition in tea includes inorganic (3.5%-7.0%) and organic (93%-96.5%) substances. The mineral elements in tea are Potassium, Magnesium, Manganese, Fluorine, Calcium, Sodium, Sulfur, Iron, Copper, Silicon, Zinc, Selenium, Etc.

Table 7: Ingredients of Herbal tea and it's health benefit

<i>Contents</i>	<i>Potential health effects</i>
Potassium	Keeping body fluids balanced
Magnesium	Maintain normal glucose metabolism
Manganese	Maintaining bones
Fluorine	Protects teeth
Calcium	Helps bone development
Sodium	Balancing body fluids
Sulfur	Has an antidiarrheal effect
Iron	involved in the synthesis of haemoglobin
Copper	Prevention of anaemia
Silicon	Improve bone development
Zine	Improve growth and development
Selenium	Boosting immunity
Nickel	Maintain normal metabolism
Polyphenols	Lowering blood lipids, antioxidants and preventing cancer.
Flavonoid	Anti-inflammatory, antibacterial and antiviral
Caffeine	Reduces tiredness and refreshes
Polysaccharid	Strengthening the body's immune system
Cellulose	Regulating the micro-ecology of the intestinal tract
Vitamin B	Maintains a healthy digestive system and skin
Vitamin C	Detoxification, Beauty
Vitamin E	Anti-oxidant/anti-ageing

[Ref: Pan et al. (2002)]






6.1.2 Discussion






The first group of essential components of tea and their functions are catechins, which are unique to tea and have a bitter and astringent taste. It can also be combined with caffeine to moderate its physiological effects on the body. Catechins have antioxidant, antitumor, blood cholesterol-lowering and blood pressure suppressing effects, and antibacterial effects (Musial et al., 2020). The second category is caffeine, which has a refreshing effect, and its bitterness is the main component of the taste of tea broth. The third category is minerals. Minerals help maintain the alkalinity of body fluids and keep healthy. The fourth category is vitamins required by the body, for example, vitamins B, C, and D.

6.2 Specifically Herbal Tea based Health Benefit

6.2.1 Result

Table 8: Specifically Herbal Tea based Health Benefit

 Chamomile	 Peppermint	 Ginger	 Rooibos	 Hibiscus
Reduces Anxiety	Reduces Anxiety	Improves Brain Function	Relieves Stress	Relieves Stress
High Source of Antioxidants	Improves Digestion	Improves Digestion	Good Source of Antioxidants	Relieves Pain from Headaches
Congestion Relief	Congestion Relief	Lowers Blood Pressure	Soothes Sore Throats	Congestion Relief
Reduces Risk of Heart Disease	Boosts the Immune System	Reduces Risk of Heart Disease	Boosts the Immune System	Reduces Risk of Heart Disease
Fights Cancer	Reduces Fevers	Fights Cancer	Reduces Inflammation	Boosts the Immune System

				
Lemon Balm	Echinacea	Dandelion	Sage	Turmeric
Improves Brain Function	Improves Brain Function	Relieves Stress	Reduces Anxiety	Improves Brain Function
Lowers Bad Cholesterol	Improves Vision	Relieves Pain from Headaches	Improves Digestion	Improves Digestion
Provides Relief from Nausea	Balances Hormones	Congestion Relief	Congestion Relief	Lowers Blood Pressure
Fights Infections	Reduces Risk of Heart Disease	Reduces Risk of Heart Disease	Boosts the Immune System	Reduces Risk of Heart Disease
Reduces Inflammation	Fights Cancer	Boosts the Immune System	Reduces Fevers	Fights Cancer

6.2.2 Discussion

6.2.2.1 Chamomile Herbal Tea's Health Benefit

Various chamomile teas vary in potency, with some containing substantially more chamomile than others. The more potent teas are also more likely to induce side effects in those who are susceptible to them. As a result, it is most prudent to begin with a modest dose and gradually increase it. Flavonoids are compounds found in chamomile (S. Khan et al., 2021). These flavonoids, a type of nutrient found in many plants, play an important role in chamomile's medicinal properties. Chamomile's anti-inflammatory, antispasmodic, sedative, and anti-anxiety properties may help alleviate premenstrual syndrome-related anxiety (Nováková et al., 2010) and discomfort (PMS). Chamomile tea has been shown in some studies to help diabetics manage their blood sugar. Those with diabetes mellitus may benefit from chamomile because it has been shown to lower glycemic, lipid, and oxidative stress levels. The findings do not suggest that chamomile should be used in place of diabetic medication, but they do suggest that it could be an effective adjunct therapy (S. Khan et al., 2021). An immunological response to infection is inflammation. Hemorrhoids, stomach pain, arthritis, autoimmune illnesses, obesity, and depression are just some of the conditions

that have been related to chronic inflammation(Barreda et al., 2012).Some studies indicate that chamomile tea may affect tumor cells or even prevent the development of those cells. According to laboratory tests, compounds in chamomile may help prevent the development of glioma, liver cancer, cervical cancer, and leukemia(Barreda et al., 2012).Chamomile tea may aid in relaxation and slumber. Individuals who have generalized anxiety disorder experienced an improvement in symptoms after 2-4 weeks of treatment with chamomile. Additionally, chamomile treatment may enhance sleep quality. There was no evidence that chamomile can alleviate the symptoms of anxiety in a person. Additionally, it does not indicate to prevent insomnia (Kato et al., 2008) .Anecdotal evidence and Subiza et al. (1990)suggest that inhaling vapor containing chamomile extract can alleviate some nasal congestion. However, this benefit has not yet been established.

6.2.2.2 Peppermint Tea's Health Benefit

Due to its clean, agreeable aroma and flavor, peppermint is a popular flavoring. Drinking peppermint tea can help refresh a person's breath, and it may have additional anti-bad breath benefits(Herro& Jacob, 2010).Peppermint oil applied to the forehead or temples may help alleviate tension or migraine headache discomfort due to the cooling effect of menthol (Akdogan et al., 2004). There is a possibility that the aroma of peppermint tea has a similar affect (Riachi & De Maria, 2015). Peppermint tea may reduce the severity of menstrual cramps, also known as dysmenorrhea. As an additional home remedy for menstrual cramps, individuals may desire to try peppermint tea (Riachi & De Maria, 2015).

6.2.2.3 Ginger Herbal Tea's Health Benefit

Ginger is a prospective herb with immense phytotherapeutic properties that is used globally. It is known as Mahaashdi in Ayurveda, which means that drinking this herb tea enhances body functions and aids in the elimination of impurities (Grzanna et al., 2005). Ginger possesses numerous therapeutic properties, including antibiotic, antimicrobial, and antioxidant effects, the ability to inhibit the formation of inflammatory compounds, and direct pro effects, according to recent scientific research. In addition, ginger is effective against certain types of malignancy, stimulates blood circulation, regulates blood pressure and hypertension(Shahrajabian et al., 2019), aids in lowering cholesterol, and is linked with preventing cardiac

disease. Ginger can be used for throat infections and to relieve congestion in sinusitis. It reduces fever in colds and flu and suppresses a dry, irritating cough in laryngitis by increasing human bronchial smooth muscle cell (BSMC) migration and proliferation and reversing phthalate ester-mediated airway remodeling (Kowser et al., 2023). Fresh ginger has hypotensive effects via both endothelium-dependent (cholinergic) and endothelium-independent (CCB) vasodilator mechanisms (Crasta et al., 2019). In experimental animals, fresh ginger extract reduces blood pressure via cholinergic and calcium-blocking (CCB) properties and possesses a combination of cardio-suppressant and cardio-stimulant effects. Cholinergic compounds are known to lower blood pressure by activating muscarinic receptors on the epithelium of coronary arteries. In addition, the pungent parts of ginger, namely 6-gingerole, 8-gingerole, gingerole, and shogaol, have a vasodilator effect via a combination of nitric oxide-releasing and calcium-antagonistic mechanisms (Salafzoon et al., 2018). Ginger's tea active ingredients work as immunomodulators, improving the body's immunity via antibacterial and free radical scavenging activities. Ginger extract considerably increases the thymus index, spleen index, and percentage of phagocytosis, therefore boosting immunologic function. Ginger not only provides warmth on a cold day, but it also promotes healthy perspiration, which is typically beneficial during colds and flus. A healthy sweat may help with much more than just cleansing. Sweat includes a powerful germ-fighting chemical that may aid in the battle against illnesses. Dermicidin is a protein produced in the sweat glands of the body, secreted into the sweat, and transferred to the surface of skin where it protects against invading microorganisms such as bacteria like *E. coli* and *Staphylococcus aureus* (a common cause of staph infections) and fungi like *Candida albicans* (Maeda-Yamamoto et al., 2007).

6.2.2.4 Rooibos Health Benefit

Increasing evidence points to the health benefits of Rooibos Tea. Health benefits, particularly those associated with Rooibos tea consumption, are the most significant. Rooibos tea contains extraordinarily high concentrations of antioxidants, which are potent substances that combat free radicals in the circulation and keep body fit and robust (McKay & Blumberg, 2007). Reductions in insomnia, tension migraines, and irritability are well-known Rooibos tea benefits. As a caffeine-free tea, Rooibos drinkers have discovered that a cup before bed helps to relax and relieve tension,

allowing for a restful night's slumber. Rooibos reduces headaches and irritability by assisting tea drinkers normalize their sleeping patterns. Although only backed by anecdotal evidence, the alleviation of colic and stomach cramps in infants is a widely acknowledged benefit in South Africa.

6.2.2.5 Hibiscus Tea Advantages

It might be time to think again. *Hibiscus sabdariffa*, a tropical floral shrub, may also have some health advantages. Hibiscus tea's have beta-carotene, vitamin C, and anthocyanin are just a few of the antioxidants found in the hibiscus plant. According to Riaz & Chopra (2018), "antioxidant-rich diets definitely benefit across the board with quite a few health issues." Free radicals, which can cause damage to human body, are destroyed by antioxidants. Diseases including cancer, heart disease, and diabetes are exacerbated by free radical damage to cells. Antioxidant-rich meals may help prevent disease in addition to the body's own antioxidants, which are used to combat free radical damage. According to Chaudhary et al. (2020) hibiscus has been demonstrated to reduce inflammation in both animal and human trials. Many diseases, including as cancer, asthma, Alzheimer's, heart disease, and rheumatoid arthritis, are influenced by inflammation. Hibiscus appears to have promising anti-inflammatory properties, but additional study is needed to confirm this. Millions of Americans suffer with high cholesterol, which is a major risk factor for cardiovascular disease and other serious health issues. Some clinical research has suggested that hibiscus can reduce cholesterol levels, but other research has found little to no benefit (Adhirajan et al., 2003). In test tubes, hibiscus tea extract inhibited the growth of several bacteria. Although it is obvious that hibiscus has antibacterial qualities, scientists are still investigating how well it works in humans. Several studies have shown that hibiscus is beneficial to liver health. Due to its powerful antioxidant activity, the extract likely shields the liver from various poisons. In liver cell assays, it has even shown modest anti-cancer action.

6.2.2.6 Lemon Balm Tea Benefit

Anxiety is a mental health issue characterized by excessive worry, anxiety, or uneasiness that gets in the way of a person's normal functioning. In addition to the United States, China, Japan, and Russia all rank anxiety as their most prevalent mental disorder (Scholey et al., 2014). Many hundreds of millions are impacted.

Medication is commonly used to manage anxiety. Fear of drug side effects, however, has prompted many people to look for alternatives. Several studies have shown that lemon balm may help with anxiety(Kennedy et al., 2002). Depression is a mood illness characterized by persistent melancholy and a diminished ability to enjoy life's pleasures. Extreme cases have been linked to suicidal ideation and behavior. Depression affects millions of people throughout the world and knows no boundaries when it comes to age or social status. Serotonin, a neurotransmitter that aids in the transmission of messages between brain cells, is increased in the majority of therapies for depression. Depression is linked to low serotonin levels, according to the study's authors (Müller & Klement, 2006). The serotonergic properties of lemon balm were discovered in a rat study. Lemon balm-infused water dramatically reduced "depressive-like behavior" in rats compared to a placebo group. Pressure and stress are inevitable in any human endeavor. Although stress is something that every human being has to deal with at some point, if it is not managed properly, it can have serious physical consequences. Stress can cause long-term health problems like insomnia if it goes unchecked. Chronic overproduction of the stress hormone cortisol in the brain leads to a reduction in white blood cells and a weakened immune system(Carnat et al., 1998). This makes a person more likely to catch a cold or contract another illness. Because of its modest calming effect, lemon balm is often recommended to people who are feeling overwhelmed by stress. Antioxidants are vital molecules that limit oxidation, the formation of free radicals that damage cells, and can be found naturally in many plant-based meals and herbs. By inhibiting or preventing cellular damage, antioxidants are beneficial to our health.The anti-oxidant properties of lemon balm have been the subject of a number of research. High levels of flavonoids, a family of chemical compounds containing phenols considered to be effective antioxidants, were detected in lemon balm in a study that evaluated the herb's anticancer capabilities. An essay on the documented benefits of lemon balm was recently released by researchers from Iran's Shahrekord University of Medical Sciences. It looked at the herb's antioxidant activities in depth, and it confirmed that the phenolic chemicals in lemon balm are responsible for much of its antioxidant activity.

6.2.2.7 Health Benefit of Echinacea Tea

Echinacea tea has a comparable tingling sensation to peppermint tea. The tea has an intense floral taste with notes of meadowsweet. The tea is also renowned for its robust

flavor and smooth aftertaste. Some individuals may find the flavor and aroma of echinacea to be a bit overpowering(Percival, 2000). For a more balanced flavor, add a trace of mint or a dash of lemon to soften the flavors.One of the primary applications of echinacea tea is to alleviate cold symptoms. Native Americans were the first to recognize echinacea's medicinal properties. The plant was broadly accessible and simple to use to treat a variety of ailments, from sore throats to inflammation(Yamada et al., 2011).As a treatment for influenza, echinacea tea was as efficacious as the gold standard drug oseltamivir(Freeman & Spelman, 2008). Echinacea extract is beneficial in the treatment of respiratory tract infections, according to an Italian study. Researchers discovered that echinacea increased the activity of white blood cells and may enhance the efficacy of flu vaccines(Lee, 2010). A steaming cup of tea can help alleviate cold symptoms, such as a sore throat and nasal congestion. While the chemical content of echinacea tea works to build immunity and enhance wellness, can find relief from cold and flu effects by consuming this delicious tea when patient are under the weather(Catchpole et al., 2002). Echinacea tea is loaded with antioxidants that are advantageous to human health. These antioxidant properties can aid in reducing inflammation and eliminating free radicals, which can lead to a variety of health issues. Free radicals have been related to accelerated aging and cellular degeneration (Gurley et al., 2008). Tea made from echinacea may help mitigate the effects of free radicals.There is something about a delicious cup of tea that makes it simple to relax. Echinacea tea enables consumer to relax and concentrate on the pleasant moments of life (Moltó et al., 2012). In addition to the basic pleasure of drinking tea, Echinacea contains compounds that may reduce anxiety.

6.2.2.8 Health Benefit of Dandelion Herbal Tea

Dandelion tea is packed with antioxidants, which are compounds that help protect cells from damage caused by harmful molecules known as free radicals. Antioxidants are essential for maintaining overall health and reducing the risk of chronic diseases such as cancer, diabetes, and heart disease. Dandelion tea is particularly high in flavonoids, which have been shown to have anti-inflammatory and anti-cancer properties. Dandelion tea has been traditionally used to support digestive health. It is believed to help stimulate the production of digestive juices and enzymes, which can help break down food and improve nutrient absorption. Dandelion tea may also act as a mild laxative, helping to relieve constipation and promote regular bowel

movements. Chronic inflammation is a common underlying cause of many chronic diseases, including arthritis, heart disease, and cancer. Dandelion tea contains compounds that have been shown to have anti-inflammatory properties, which may help reduce inflammation and lower the risk of developing chronic diseases. The liver is an essential organ that plays a crucial role in detoxifying the body and processing nutrients. Dandelion tea has traditionally been used to support liver health and function. It may help improve liver function by increasing the production of bile, which is essential for digestion and the elimination of waste products from the body. Overall, dandelion tea is a nutritious and potentially beneficial beverage that may offer a range of health benefits. As with any herbal tea or supplement, it's important to consult with a healthcare provider before consuming dandelion tea, especially if you have any pre-existing medical conditions or are taking medications. González-Castejón et al., (2012)

6.2.2.9 Health Benefit of Sage Herbal Tea

Sage possesses antibacterial properties that aid in the fight against plaque and other oral health disorders. Studies demonstrate that drinking sage tea has a similar impact to mouthwashes that contain sage extract (Azevedo et al., 2011). The anti-inflammatory qualities of sage tea can also help reduce any inflammation in mouth and throat. Sage tea was given to persons with mild to moderate Alzheimer's disease for 16 weeks in one research (Arceusz et al., 2013). The outcomes demonstrated enhanced cognitive measures and reduced agitation. One tablespoon of dried sage leaves can be steeped in a cup of boiled water to make sage tea. After letting the leaves steep for 5 to 8 minutes, depending on preferred strength, strain them out. Consumer can make sage tea with ground sage, but be careful when filtration to avoid a gritty texture (Walch et al., 2012). Consumer can enjoy the infusion's various health advantages once it has cooled down to a safe temperature.

6.2.2.10 Health Benefit of Turmeric Tea:

Turmeric tea has been shown to reduce inflammation, strengthen the immune system, and alleviate discomfort. There are numerous vitamins, minerals, and some other healthy nutrients in turmeric tea. These include manganese, iron, but rather copper in addition to curcumin, a potent antioxidant. Turmeric's anti-inflammatory qualities are among its most well-known advantages. The curcumin in turmeric has shown promise

in treating and preventing chronic inflammatory disorders, according to research (Apak et al., 2006).Turmeric's anti-microbial characteristics can help strengthen your autoimmune response and prevent colds. Turmeric can help strengthen your body's natural defenses, even while it probably won't be able to prevent more serious diseases on its own (Xanthopoulou et al., 2016). Turmeric has been demonstrated to enhance memory and cognitive function, making it easier to get through the day at work. Turmeric tea may assist. It has been demonstrated that curcumin has neuroprotective properties and can reduce the severity of migraine and headache pain. Researchers have shown that turmeric may help reduce the negative effects of stress and depression.

6.3 Major Possible Side Effect of Herbal Tea

6.3.1 Result

Table 9: Major Possible Side Effect of Herbal Tea

Herb/Tea	Possible Side Effects
Chamomile	May cause allergic reactions in some people, including skin irritation, swelling, and difficulty breathing. May also cause drowsiness, especially when combined with other sedatives.
Peppermint	May cause heartburn, allergic reactions, and headaches in some people. Large doses may also cause muscle tremors, seizures, and other nervous system effects.
Ginger	May cause mild side effects such as stomach upset, heartburn, and diarrhea. May also increase the risk of bleeding in people taking blood-thinning medications.
Echinacea	May cause allergic reactions in some people, including skin rashes, hives, and difficulty breathing. Long-term use may also reduce the effectiveness of the immune system.
Dandelion root	May cause allergic reactions in some people, including skin irritation, swelling, and difficulty breathing. May also interact with certain medications, including diuretics and blood thinners.
Hibiscus	May lower blood pressure and interact with certain medications, including diuretics and blood pressure medications. May also cause

Herb/Tea	Possible Side Effects
	upset stomach and headache in some people.
Lemon balm	May cause allergic reactions in some people, including skin rash and difficulty breathing. May also interact with certain medications, including thyroid medications and sedatives.
Rooibos	May cause side effects such as headaches, insomnia, and gastrointestinal upset. May also interact with certain medications, including blood-thinning drugs and insulin.
Sage	May cause side effects such as dizziness, headaches, and upset stomach. May also cause drowsiness and impair your ability to drive or operate machinery.
Turmeric	May cause side effects such as dry mouth, dizziness, and gastrointestinal symptoms. May also interact with certain medications, including antidepressants, birth control pills, and blood-thinning drugs.

6.3.2 Discussion

6.3.2.1 Side Effects of Chamomile Tea

Chamomile tea is generally considered safe for consumption and is well-tolerated by most people. However, some people may experience side effects from drinking chamomile tea, especially if consumed in large amounts or if they have allergies to the plant. Here are some possible side effects of chamomile tea (Chang & Chen, 2016). People who are allergic to plants in the daisy family, such as ragweed, chrysanthemums, and marigolds, may also be allergic to chamomile. Allergic reactions can range from mild symptoms like itching and swelling to severe reactions like anaphylaxis. Chamomile tea can interact with certain medications, such as blood thinners, sedatives, and antidepressants, which can increase their effects and cause adverse reactions. Some people may experience nausea, vomiting, and stomach upset after consuming chamomile tea, especially if they have a sensitivity to the plant. Applying chamomile topically or consuming large amounts of chamomile tea can cause skin irritation or allergic reactions. It's important to note that these side effects are relatively rare, and most people can consume chamomile tea without any adverse effects (Zemestani et al., 2016).

6.3.2.2 Side Effects of Peppermint tea

While peppermint has numerous health advantages, excessive consumption can be detrimental. Here is a summary of the potential risks of drinking mint tea, in case you were oblivious. Continue reading to discover what you ought to think about before grabbing a cup of peppermint tea. The measurement of glucose concentration in the bloodstream is commonly referred to as blood sugar level (Kapp et al., 2013). Peppermint tea is consumed by certain individuals to alleviate nausea symptoms experienced during pregnancy. However, the consumption of this tea during pregnancy has been associated with significant adverse effects (Zivkovic et al., 2018). Peppermint tea has been observed to have an impact on certain medications. The consumption of peppermint tea has been observed to interact with medications utilized in the treatment of stomach acid, cyclosporine, high blood pressure, and diabetes, thereby resulting in the occurrence of adverse effects. It is advisable to refrain from consuming peppermint tea if one is currently undergoing medication for the aforementioned conditions (Kaltner et al., 2018). It is advisable to seek advice from a medical professional prior to the consumption of this tea. Peppermint tea is deemed to be a safe beverage for consumption and is rich in essential nutrients (Xia et al., 2021). Excessive consumption of peppermint tea may result in adverse effects. Individuals with indigestion may find it unsuitable.

6.3.2.3 Side Effects of Ginger Tea

May cause mild side effects such as stomach upset, heartburn, and diarrhea. May also increase the risk of bleeding in people taking blood-thinning medications.

6.3.2.4 Side Effects of Rooibos tea

Rooibos tea is a caffeine-free herbal tea that is generally considered safe for most people to consume. However, like any other herbal tea, it may cause side effects in some individuals. Rooibos tea contains compounds that may bind to iron in the body, potentially reducing the amount of iron that is absorbed from food. This can be a concern for individuals who are at risk of iron deficiency or anemia. May cause allergic reactions: Although rare, some people may be allergic to rooibos tea. Symptoms of an allergic reaction can include hives, itching, swelling of the lips or tongue, and difficulty breathing. Rooibos tea may interact with certain medications, including chemotherapy drugs and medications used to treat anxiety or depression.

6.3.2.5 Side Effects of Hibiscus Tea

Hibiscus tea is generally considered safe for most people when consumed in moderation. However, like any other herbal supplement or beverage, it may cause side effects in some individuals. Hibiscus tea is known to have blood pressure-lowering effects, which can be beneficial for people with high blood pressure. Already have low blood pressure, drinking hibiscus tea may cause blood pressure to drop too much, leading to dizziness, lightheadedness, and even fainting. Hibiscus tea may interact with certain medications, such as antihypertensive drugs, diuretics, and some antibiotics. Consumer are taking any prescription medications, consult with doctor before consuming hibiscus tea. Some people may experience stomach upset, including nausea, vomiting, and diarrhea, after drinking hibiscus tea. This is more likely to occur drink large amounts of the tea (Nunes et al., 2017). Hibiscus tea may cause allergic reactions in some people, especially those who are allergic to other plants in the mallow family, such as marshmallow and okra. Some studies have suggested that hibiscus tea may have estrogenic effects and may interact with hormone replacement therapy. History of hormone-sensitive cancers, such as breast or ovarian cancer, talk to doctor before consuming hibiscus tea.

6.3.2.6 Side Effects of Lemon Balm Tea

That's everything wonderful about cup of tea covered and there's much to be happy about. Regrettably, yes. Headaches, pain when urinating, elevated body temperature, sickness, vomiting, stomach discomfort, dizziness, and wheezing are all possible side effects (Awad et al., 2009).

6.3.2.7 Side Effects of Echinacea Tea

Echinacea tea is a herbal tea made from the Echinacea plant, which is native to North America. It is commonly used as a natural remedy for colds, flu, and other respiratory infections (Gilroy et al., 2003). While Echinacea tea is generally considered safe for most people when consumed in moderate amounts, Echinacea tea can cause gastrointestinal side effects such as nausea, vomiting, diarrhea, and stomach pain (Bardia et al., 2007). Echinacea tea may cause dizziness, especially in people who are prone to low blood pressure (Rininger et al., 2004). Echinacea tea may interfere with sleep, particularly if consumed late in the day. Echinacea may interact with certain medications, including immunosuppressants and drugs used to treat HIV. It is always

recommended to consult with a healthcare provider before adding any new supplement or herbal remedy to patient diet, particularly consumer have any underlying health conditions or take any medications.

6.3.2.8 Side Effect of Dandelion Tea

Dandelion tea is generally considered safe, but some individuals may experience side effects. One of the most common side effects of dandelion tea is an allergic reaction, which may manifest as itching, hives, or difficulty breathing. This is because dandelion is a member of the Asteraceae family, which can cause allergies in some people. Another potential side effect of dandelion tea is digestive issues, such as stomach cramps, diarrhea, and nausea. This is especially true if the tea is consumed in large amounts, as dandelion has a laxative effect and can cause gastrointestinal upset. Dandelion tea may also interact with certain medications, such as diuretics, blood thinners, and antibiotics. This can lead to adverse reactions and should be discussed with a healthcare provider before consuming dandelion tea. Furthermore, dandelion tea may lower blood sugar levels, which can be problematic for individuals with diabetes or hypoglycemia. This is because dandelion contains compounds that can stimulate the release of insulin, which can lower blood sugar levels. Lastly, dandelion tea is a natural diuretic, meaning it can increase urine output and lead to dehydration if consumed excessively. This can result in symptoms such as thirst, dry mouth, and dizziness.

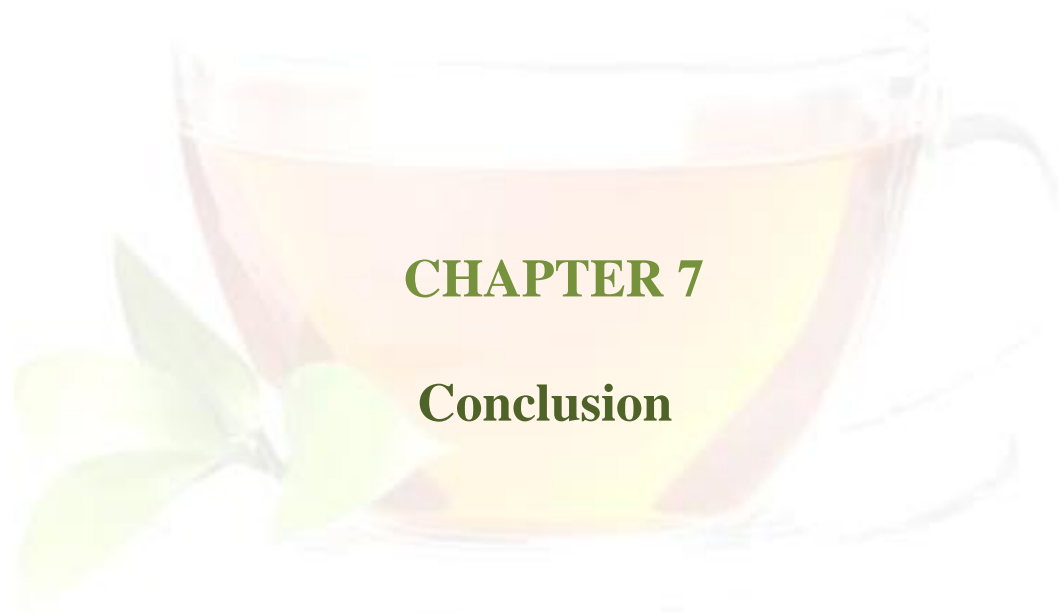
6.3.2.9 Side Effects of Sage Tea

There is currently insufficient data to draw firm conclusions about the risks associated with drinking herbal teas, but the following are some possibilities. The truth is, there are as many herbal teas as there are potential adverse effects. The most frequent adverse reactions, however, include anti-anaphylactic shock, dermatitis, vomiting, nausea, dizziness and headache.

6.3.2.10 Side Effects of Turmeric Tea

When used briefly, turmeric teas are probably harmless. Turmeric products containing up to 8 grams of curcumin per day appear to be safe when used for up to 2 months, and consuming up to 3 grams of turmeric per day appears to be safe when used for up to 3 months(R. U. Khan et al., 2012). Typically, turmeric does not cause significant

side effects. Some individuals may experience mild adverse effects, including stomach distress, nausea, vertigo, or diarrhea. At higher dosages, these adverse effects are more frequent. Uric is probably harmless. Turmeric mouthwash is presumably safe (Malik & Kumar, 2022).

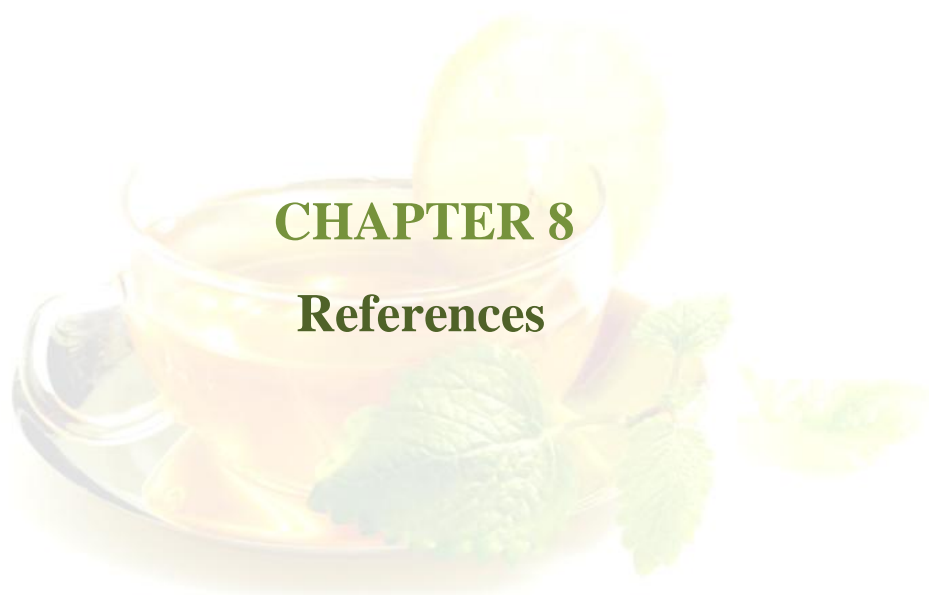


CHAPTER 7

Conclusion

7.0 Conclusion

Tea, in the form of herbal tea, is one of the world's most popular beverages. As dietary supplements, tea leaf extracts are also available. With growing interest in the health benefits of tea and a substantial increase in scientific research, this review examines recent findings on the medicinal properties and noncancer health benefits of chamomile, peppermint, ginger, rooibos, hibiscus, lemon balm, echinacea, dandelion, sage, and turmeric. Herbal tea contains a distinctive set of catechins that exhibit biological activity in antioxidant, anti-angiogenesis, and antiproliferative assays, which may be applicable to the prevention and treatment of a variety of diseases. Although much attention has been paid to the biological properties of the major catechin in tea, epigallocatechingallate (EGCg), and its antitumor properties, tea offers additional health benefits due to the presence of other essential components. Tea's anticancer activity and improvement in cardiac health and atherosclerosis may be attributable to characteristics unrelated to the antioxidant properties of herbal teas. Theanine in green tea may help reduce tension. Catechins that have been oxidized may lower blood cholesterol levels. The synergistic properties of green tea extracts with other sources of polyphenolic constituents are increasingly recognized as potentially important to the medicinal benefits of herbal tea. Additionally, due to its putative antioxidant and anti-aging properties, tea is now being incorporated into topical formulations. Each of these is a literary review. The current state of knowledge only encompasses 10 herbs based on the properties of this tea: chamomile, peppermint, ginger, rooibos, hibiscus, lemon balm, echinacea, dandelion, sage, and turmeric. To confirm the validity of commonly implemented for increased consumption of tea wines made from chamomile, peppermint, ginger, rooibos, hibiscus, lemon balm, echinacea, dandelion, sage, and turmeric, it will be necessary to conduct deeper and broader analyses of the effects of these teas on the human body.



CHAPTER 8

References

8.0 References

- Charrier, M. J., Savage, G. P., & Vanhanen, L. (2002). Oxalate content and calcium binding capacity of tea and herbal teas. *Asia Pacific Journal of Clinical Nutrition*, *11*(4), 298–301. <https://doi.org/10.1046/j.1440-6047.2002.00294.x>
- Chen, M. (2002). Tea and Health: An Overview. In *Tea*. CRC Press.
- Craig, W. J. (1999). Health-promoting properties of common herbs. *The American Journal of Clinical Nutrition*, *70*(3), 491S-499S. <https://doi.org/10.1093/ajcn/70.3.491s>
- Deka, A., & Vita, J. A. (2011). Tea and cardiovascular disease. *Pharmacological Research*, *64*(2), 136–145. <https://doi.org/10.1016/j.phrs.2011.03.009>
- Green Tea of Kazi*. (2023). <https://www.thebasketbd.com/a00745.html>
- Halda Valley – Tea*. (2023). <https://haldavalley.com/>
- Halder, S. (2023, January 30). *Tea production went down last year*. The Daily Star. <https://www.thedailystar.net/business/economy/news/tea-production-went-down-last-year-3233946>
- Hamdad. (2023). *Herbal Product: Hamdard Laboratories (Waqf) Bangladesh*. <https://hamdard.com.bd/product-showcase/herbal-product/>
- Hossan, S. (2022, March 26). *Tea Industry of Bangladesh: Present Status and Future Needs*. Business Inspection BD. <https://businessinspection.com.bd/tea-industry-of-bangladesh/>
- Khan, S., Jan, G., Ahmad, M., Gul, F., Zafar, M., Mangi, J. U. D., Bibi, H., Sultana, S., Usma, A., & Majeed, S. (2021). Morpho-palynological assessment of some species of family Asteraceae and Lamiaceae of District Bannu, Pakistan on the bases of light microscope & scanning electron microscopy. *Microscopy Research and Technique*, *84*(6), 1220–1232. <https://doi.org/10.1002/jemt.23681>
- Maeda-Yamamoto, M. (2013). Human Clinical Studies of Tea Polyphenols in Allergy or Life Style-related Diseases. *Current Pharmaceutical Design*, *19*(34), 6148–6155.

- Molassiotis, A., Fernandez-Ortega, P., Pud, D., Ozden, G., Scott, J. A., Panteli, V., Margulies, A., Browall, M., Magri, M., Selvekerova, S., Madsen, E., Milovics, L., Bruyns, I., Gudmundsdottir, G., Hummerston, S., Ahmad, A. M.-A., Platin, N., Kearney, N., & Patiraki, E. (2005). Use of complementary and alternative medicine in cancer patients: A European survey. *Annals of Oncology*, *16*(4), 655–663. <https://doi.org/10.1093/annonc/mdi110>
- Nibir, Y. M., Sumit, A. F., Akhand, A. A., Ahsan, N., & Hossain, M. S. (2017). Comparative assessment of total polyphenols, antioxidant and antimicrobial activity of different tea varieties of Bangladesh. *Asian Pacific Journal of Tropical Biomedicine*, *7*(4), 352–357. <https://doi.org/10.1016/j.apjtb.2017.01.005>
- Nikolić, M., & Stevović, S. (2015). Family Asteraceae as a sustainable planning tool in phytoremediation and its relevance in urban areas. *Urban Forestry & Urban Greening*, *14*(4), 782–789. <https://doi.org/10.1016/j.ufug.2015.08.002>
- Saha, J. K., Adnan, K. M. M., Sarker, S. A., & Bunerjee, S. (2021). Analysis of growth trends in area, production and yield of tea in Bangladesh. *Journal of Agriculture and Food Research*, *4*, 100136. <https://doi.org/10.1016/j.jafr.2021.100136>
- Sato, Y., Nakatsuka, H., Watanabe, T., Hisamichi, S., Shimizu, H., Fujisaku, S., Ichinowatari, Y., Ida, Y., Suda, S., Kato, K., & Ikeda, M. (1989). Possible Contribution of Green Tea Drinking Habits to the Prevention of Stroke. *The Tohoku Journal of Experimental Medicine*, *157*(4), 337–343. <https://doi.org/10.1620/tjem.157.337>
- Sharma, V. S., & Ranganathan, V. (1985). The world of tea today. *Outlook on Agriculture*, *14*(1), 35–40. <https://doi.org/10.1177/003072708501400105>
- Sreemangal Tea Gardens*. (2023). <http://offroadbangladesh.com/places/sreemangal-tea-garden/>
- Stander, M. A., Brendler, T., Redelinghuys, H., & Van Wyk, B.-E. (2019). The commercial history of Cape herbal teas and the analysis of phenolic compounds in historic teas from a depository of 1933. *Journal of Food*

Composition and Analysis, 76, 66–73.
<https://doi.org/10.1016/j.jfca.2018.11.001>

Sueoka, N., Suganuma, M., Sueoka, E., Okabe, S., Matsuyama, S., Imai, K., Nakachi, K., & Fujiki, H. (2001). A New Function of Green Tea: Prevention of Lifestyle-related Diseases. *Annals of the New York Academy of Sciences*, 928(1), 274–280. <https://doi.org/10.1111/j.1749-6632.2001.tb05656.x>

Syed, S. (2012). Recovery of gold from secondary sources—A review. *Hydrometallurgy*, 115–116, 30–51.
<https://doi.org/10.1016/j.hydromet.2011.12.012>

Szymczycha-Madeja, A., Welna, M., & Zyrnicki, W. (2013). Multi-element analysis, bioavailability and fractionation of herbal tea products. *Journal of the Brazilian Chemical Society*, 24, 777–787. <https://doi.org/10.5935/0103-5053.20130102>

Tetley Green tea bag- Lemon & Honey. (2023). <https://www.tetley-bd.com/our-teas/green-tea/tetley-green-tea-bag-lemon-honey>

The Most Beautiful Tea Gardens in Bangladesh to visit. (2021). <https://unb.com.bd/category/lifestyle/the-most-beautiful-tea-gardens-in-bangladesh-to-visit/78029>

Tulsi Pati Green Tea. (2023). *RIGS WEB STORE*. <https://rigs.com.bd/product/tulsi-pati-green-tea/>

Van Wyk, B.-E., & Gorelik, B. (2017). The history and ethnobotany of Cape herbal teas. *South African Journal of Botany*, 110, 18–38.
<https://doi.org/10.1016/j.sajb.2016.11.011>

Zhao, J., Deng, J. W., Chen, Y. W., & Li, S. P. (2013). Advanced phytochemical analysis of herbal tea in China. *Journal of Chromatography A*, 1313, 2–23.
<https://doi.org/10.1016/j.chroma.2013.07.039>