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Review Article

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Intrinsic therapeutic applicability of bergamot oil & infused earl grey tea for healthcare & wellbeing

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ABSTRACT

A fragrant Mediterranean citrus fruit, bergamot, have been found to contain two compounds, viz. brutieridin and meltidin. Both are classified as flavone glycosides, a group of natural antioxidant compounds that typically occur in small amounts in various plants, from fruits and vegetables to herbs. This category of natural compounds is attracting increasing scientific attention. Both brutieridin and meltidin occur in the cholesterol-lowering extract. Bergamot peel contains the characteristic *Citrus* species flavanone rutinosides and neo-hesperosides derived from naringenin, eriodictyol and hesperetin. Moreover, a small amount of flavone *O*- and *C*-glycosides, not previously found in orange and lemon peels, have been identified. One of the most common Teas containing bergamot oil, obtained from the bergamot orange peel, is Earl Grey. Drinking bergamot infused EGT could help guard against heart disease, it has emerged, after a study found that bergamot extract - a key ingredient in the hot drink - is just as effective as statins at controlling cholesterol.. It contains enzymes known as HMGF which can attack proteins in the body known to cause heart disease. The bergamot in EGT has been known to have a calming effect on people, as well as to boost a person's mood. This is due to bergamot's natural aromatherapy qualities. In this way EG is a good natural solution for people suffering from depression, stress and anxiety

Keywords: EGT, HMGF, Antioxidants, BEO, Polyphenols, Cicatrisant, Sedative, Phototoxicity

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1. Introduction

Bergamot tree (*Citrus bergamia*) from the Rutaceae family produces a type of citrus fruit. The bergamot tree is the result of the cross-breeding of the lemon tree and the orange tree, which explains its pear-like shape and yellow color. It is a tropical plant, but thrives in Europe as well. Its powerful aroma makes it a popular component in many perfumes, and it is often used as the all-important “top note”. Although its roots can be traced back to South East Asia, bergamot was more widely cultivated in Southern Italy, specifically sun-drenched slopes of the hills and mountains/ coastal regions of Reggio di Calabria and Sicily.. A native North American perennial, it has a distinctive pink, red or purple bloom and four-sided, ridged stems. Believed to be an ancient hybrid of two other species of orange, bergamot is tart in taste, and bright yellow like lemon. In fact, bergamot is the symbol of the Reggio district of Calabria, and is a source of great regional pride. The fruit is also grown in France and Ivory Coast Africa. Bergamot, be it from the bergamot orange or from the unrelated herb known as wild bergamot (-goes by many common names, including Oswego, bee balm, horse mint and Indian nettle.), offers many health benefits. Though the plants come from different families and species, they have one thing in common: their distinctive aroma. They have a pleasant orange-blossom fragrance that, studies have shown, calm anxiety and depression. Both aid in digestive ailments, but only the bergamot orange peel provides high amounts of antioxidants and antimicrobial properties. Researchers over the past decade or more have turned their attention to other uses of bergamot, namely as a cholesterol-lowering ingredient. The essential oil of the orange skin is a valuable ingredient in various perfumes. As a matter of fact, bergamot essential oil was named after the city of Bergamo in Lombardy, Italy, where it was originally sold¹⁻³.

Polyphenols from fruits, vegetables and cereals, herbs and spices have been shown to have beneficial effects on human health, and some extracts of polyphenol-rich plants have been used in functional foods or as supplements. Among polyphenols, flavonoids are secondary metabolites well documented for their biological effects, including anticancer, antiviral, antimutagenic and anti-inflammatory activities. The term flavonoid includes the following commonly occurring polyphenols: flavanones, flavones, flavan-3-ols, flavonols and anthocyanins. Flavonoids can function as direct antioxidants and free radical scavengers, and have the capacity to modulate enzymatic activities and inhibit cell proliferation. In plants, they appear to play a defensive role against invading pathogens, including bacteria, fungi and viruses. Flavonoids are generally present in glycosylated forms in plants, and the sugar moiety is an important factor determining their bioavailability⁴.

Bergamot peel represents about 60% of the processed fruits and is regarded as primary waste; if not processed further, it may cause environmental problems because of its

fermentability. However, bergamot peel contains very useful compounds, such as pectins and flavonoids. The peel contains the characteristic *Citrus* species flavanone rutinosides and neo-hesperosides derived from naringenin, eriodictyol and hesperetin. Moreover, a small amount of flavone *O*- and *C*-glycosides, not previously found in orange and lemon peels, have been identified. It is well documented that the free radical scavenger activity of flavonoids mainly depends on the arrangement of the substituents within its structure. However, the correlation between antioxidant activity and chemical structure of flavonoids is still unclear. Polyphenol glycosides are relatively hydrophilic and do not diffuse across biological membranes. While simple flavonoid glucosides can be taken up into cells, and aglycones are absorbed by passive diffusion, the small intestine is unable to absorb the rutinoside forms. Therefore, a full or partial deglycosylation step is critical for the absorption of flavonoids. It has been demonstrated that enzyme treatments of monosaccharidic and disaccharidic flavonoids producing lipophilic derivatives increased both their antimicrobial and antioxidant activities⁵.

EGT & its natural aroma therapy qualities

One of the most common Teas containing bergamot oil, obtained from the bergamot orange peel, is EG (Earl Grey). The bergamot oil gives EG its orange-blossom-like aroma, but it also adds other values. Antioxidants play an important role in preventing cell damage and maintaining a youthful appearance. Bergamot oil, typically added to enhance a Tea's flavor or aroma, offers an impressive amount of antioxidants. EGT (Earl Grey Tea) has been known to improve digestion. It aids in the digestive process and helps relieve painful indigestion, colic and nausea. It is also used to treat intestinal problems such as worms. Because it helps the digestive process, it can also help to keep you regular. The bergamot in EGT has been known to have a calming effect on people, as well as to boost a person's mood. This is due to bergamot's natural aromatherapy qualities. In this way EG is a good natural solution for people suffering from depression, stress and anxiety. Unsurprisingly, one of the most popular effects of EGT is weight loss. It has been observed that people who drank 3 cups of black Tea daily dramatically lowered their blood triglyceride levels and increased the 'good cholesterol' HDL after 3 months. The participants also had increased levels of antioxidants, which, as we now know, fight against free radicals that damage your cells. Further research conducted by the University of Cantanzaro in Italy has also yielded positive results. A study of over two hundred patients with high levels of blood fats found that LDL (also known as 'bad cholesterol') was reduced by 39% after a month of taking EG extract. It also reduced blood sugars by 22% and raised 'good' cholesterol by 41%. The reduction in blood sugar also shows that EG may be highly beneficial for those suffering with diabetes. Unlike the effects of coffee, EGT

relaxes and soothes the body almost instantly. It also has a stress relief effect whilst simultaneously providing the same clarity and focus as coffee. This makes it the perfect alternative for those who don't want to get overly wired from coffee. The bergamot found within EG is said to improve the immune system as well as cure fevers. As such, it's considered to be a natural cold remedy. Unlike the dehydrating properties of coffee, EGT helps us stay hydrated and maintains the body's fluid balance because of its high K content⁶⁻⁷.



The study found bergamot could even be as effective as statins, used to control cholesterol but which can have side effects in patients. The concentrations of HMGF (hydroxy methyl glutaryl flavonones) on the proteins which cause heart disease and 'bad' cholesterol have also been found useful. However, a new study has found that statins could have other medical benefits. Researchers at Rutgers Robert Wood Johnson Medical School in the US found the popular cholesterol-lowering drugs may offer added benefit for men with erectile dysfunction. It is thought the statins may work to improve erectile function by helping blood vessels dilate properly and improving vascular blood flow to the penis, which is often restricted in men with erectile dysfunction⁸.

2. Facts about EGT

The much-loved flavor of EGT has earned it the honor of being the second most popular Tea in the world. Full and rich with a light citrus aroma, it's interesting history and unique characteristics set this scented Tea apart. The story goes that the blend now enjoyed as EG was originally made for the second EG of Howick Hall in Northumberland, UK. Then serving as Prime Minister, this particular EG is known for penning the Reform Bill of 1832 which focused on electoral reform. Many stories exist to explain why the second EG had a Tea made specifically for him. Jacksons of Piccadilly claims to be the originator of the formula, though other sources say that the citrus infusion was used to counteract the lime in the water around the Howick Hall area. Whatever the case, ads for the Tea first appeared in the 1880s from Charlton & Co., and it has been enjoyed by people in many countries ever since. When steeped, EGT has a pleasing bright color somewhere between red and amber. The citrus scent and flavor comes from the bergamot orange. The oil from the fruit or the flowers of the plant may be used to infuse this special taste. As a moderately caffeinated black Tea, EG makes a nice breakfast drink, though it can be enjoyed with just about any meal. It shares the astringent flavor characteristic of other black Teas but has an almost floral fragrance thanks to the bergamot. Variations known as Lady Grey may include flavors from Seville oranges or an infusion of lavender flowers. Russian EG blends contain citrus peel, and there are even bergamot-scented green Teas

appropriately dubbed Earl Green. The most obvious and popular way to enjoy EG is in a cup or pot of Tea. The astringent qualities of the flavor offset fatty and heavy foods quite well, making it a good choice to accompany desserts and other treats. Milk isn't generally added to this type of Tea, but some people like it with a touch of lemon and honey to round out the flavor. EGT is also used to infuse baked goods and candies with the special taste of black Tea and bergamot. The Tea is steeped as if for drinking and then used in recipes to create a unique finished product. Muffins, cookies, cakes, pastries and even chocolates are all delicious when blended with Earl Grey. Whether you prefer loose leaf or our handcrafted pyramid infusers, you'll find an EG that suits your tastes at Tea Forté. Shop the gourmet blends and inhale the light citrus essence as you enjoy a cup of rich, comforting Tea.

Health Benefits of BEO

BEO (Bergamot Essential Oil) is one of my favorite citrus oils to enjoy in the diffuser and to *mindfully* use in topical applications. The aroma of BEO is reminiscent to that of orange, but it is wonderfully more complex. It almost seems to possess an underlying floral characteristic to it. Drinkers of EGT are especially familiar with the flavor and aroma of bergamot as the oil is used to flavor the Tea. BEO may be helpful in use during periods of depression, sadness or grief, and it is known for its ability to help combat oily skin and acne. Because it is highly phototoxic, it must be used with care on the skin and avoided when exposed to the sun or UV rays. Bergaptene is the naturally occurring chemical constituent found in Bergamot Essential Oil that makes the oil so highly phototoxic³. Varieties of Bergamot Essential Oil are available that have the bergaptene synthetically removed. Bergamot Essential Oil is sometimes available as a steam distilled oil. Bergamot oil boasts of powerful antibacterial, analgesic, antiseptic, antispasmodic, and soothing effects.



The chemical composition of Bergamot Oil includes Alpha Pinene, Alpha Bergapten, Alpha Terpineol, Limonene, Linalool, Linalyl Acetate, Nerol, Neryl Acetate, Beta Bisabolene, Geraniol, Geraniol Acetate and Myrcene. Bergamot Oil has a very sweet smell and a number of medicinal and industrial uses due to its properties, many of which are listed below⁹⁻¹¹.

Antidepressant & Stimulant: The components of Bergamot Oil, like Alpha Pinene and Limonene, are antidepressant and stimulating in nature. They create a feeling of freshness, joy and energy in cases of sadness and depression by improving the circulation of the blood.

They also stimulate hormonal secretions, thereby helping to maintain proper metabolic rates. This stimulating effect also increases the secretion of digestive juices, bile and insulin, thereby aiding digestion, proper absorption of nutrients, assimilation and decomposition of sugar and the resultant lowering of blood sugar. The hormonal impact of bergamot essential oil is part of the reason that it is so powerful on these neurological and mental conditions. **Antibiotic & Disinfectant:** Certain components of the essential oil of Bergamot are antibiotic and disinfectant in nature. They inhibit the growth of germs, virus and fungi. They also effectively prohibit infections, including those of the skin. If regularly used with bathing water or in soaps (it is already used extensively in skin care soaps), the skin and hair remains protected from infections and become shiny. It also cures infections of the colon, intestines, urinary tract and kidneys.

Analgesic: Bergamot essential oil reduces the feeling of pain in the body. Actually, it stimulates secretion of certain hormones which lessen sensitivity of nerves to pain. Therefore, it is very helpful in case of headaches, sprains, muscle aches or any other symptoms or ailments which require a heavy dosage of analgesic pills. This means that you can avoid the dangerous side effects of many over the counter pain medicines, which often have adverse side effects and can do damage to your liver and kidneys when relied on heavily, as well as thinning your blood, or causing you to lose sleep.

Relaxant & Sedative: The flavonoids present in Bergamot oil are very good relaxants as well. They soothe nerves and reduce nervous tension, anxiety, and stress, all of which can help cure or treat ailments associated with stress such as sleeplessness, high blood pressure, insomnia, and depression. They can also stimulate the activity of certain hormones in the body, which induce feelings of relaxation and sedation, like dopamine and serotonin.

Digestive: As discussed above, bergamot essential oil activates and increases secretions of the digestive acids, enzymes and bile and facilitates digestion. It also synchronizes and regulates the peristaltic motion of the intestines and in this way, it quickens the digestive process and reduces strain to the intestinal tract. In this way, bergamot essential oil can reduce constipation, make bowel movements more regular, and prevent gastrointestinal complications like colorectal cancer and other uncomfortable or dangerous conditions¹².

Cicatrissant: This property of bergamot oil is the reason behind its extensive use in cosmetics and skin care products such as beauty soaps, creams, and lotions. Cicatrissant means a property or an agent which helps scars and other marks on the skin to disappear. It also makes the distribution of pigments and melanin even and uniform, resulting in the fading away of marks and an even, attractive skin tone. This essential oil is commonly used to eliminate the unsightly effects of acne, which can leave

noticeable scars and marks on the affected areas for many years.

Deodorant: This property of bergamot oil makes it popular with the younger generation who is always trying the new deodorants on the market, desperately searching for something truly refreshing and natural. Bergamot essential oil is an excellent deodorant. Its refreshing aroma and disinfectant properties, which inhibit growth of germs causing body-odor, make it an effective and attractive delivery system as a deodorant. Citrus smells are very powerful, and can overcome or eliminate many other odors that people smell in a certain area, which is why bergamot oil is also used in room fresheners and sprays.

Febrifuge: A febrifuge is a substance or an agent that reduces fever and lowers body temperature. Bergamot is a good febrifuge for a number of reasons. First of all, as an antibiotic, it fights infections that arise from viruses, bacteria and protozoa that cause fever, including influenza (virus), malaria (protozoa) and typhoid (typhus bacteria). Secondly, it stimulates the metabolic system and gland secretions, thereby providing a feeling of warmth and resulting in additional secretion (perspiration or sweat) from the Eccrine glands (sweat glands) and sebaceous (sebum) glands, thus reducing body temperature. This can also reduce toxicity of the body through perspiration, and clean out the glands and pores of any foreign toxins that can result in a variety of skin conditions.

Vermifuge: It kills worms, and it is a subtle and fragrant choice for children who have contracted worms. It can also be applied on unhealthy, infected teeth or used as a mouthwash to kill oral germs and protect teeth from the development of cavities. Intestinal worms can result in malnourishment and other serious deficiencies including various forms of anemia, so eliminating these worms, particularly in growing children, is a very important application of bergamot essential oil.

Antispasmodic: It relaxes nerves and muscles, thereby giving quick relief for cramps, convulsions, and painful muscle contractions. This can also be important for people with chronic coughing or respiratory conditions, as well as asthma, which is similar to a spasmodic reaction. **Antiseptic and Vulnerary:** The same disinfectant and antibiotic properties of bergamot oil make it a good antiseptic and vulnerary agent. It not only promotes fast healing of wounds, cracks on the skin and heels, ulcers, eczema, and itching, but it also protects wounds from becoming septic and developing deadly tetanus. It not only treats and heals the effects of other infections, but inhibits the formation of new infections.

Other Benefits: Bergamot essential oil is also a tonic, meaning that it tones up the respiratory, circulatory, digestive, excretory, and nervous system, as well as skin and muscles. It is also anticongestive and is used in vaporizers to relieve congestion and respiratory problems, particularly during coughs and colds. It works as an expectorant to loosen up phlegm and mucus in the respiratory tracts and helps the body to eliminate through

natural avenues like sneezing and productive coughs, thereby reducing the total amount of material and eliminating some of the germs and toxins that caused the condition in the first place. Although research has been limited on some of these issues, the respiratory and digestive effects of bergamot essential oil may be even more extensive than originally thought. Ongoing studies show that application of bergamot essential oil may be able to eliminate the formation of gall stones and protect against colic, halitosis, bronchitis, and diphtheria¹³.

3. Culinary uses

The extracts have even been used in jams, ice cream and perfumes in the region, said the researchers. Native Americans made a Tea from the plant's leaves for therapeutic purposes. Its uses included treatment of fevers, heart ailments, nausea and vomiting and to improve appetite. Science hasn't proved the utility of any of these treatments, though wild bergamot is part of the mint family and carries many similar properties. The juice, with its tart grapefruit-like flavor, is a favored drink in the island nation of Mauritius, in the Indian ocean, where bergamot is grown on a small scale. One of the most popular effects of EGT is weight loss. This is primarily due to its citrus extract. It's because of this that many people believe that citrus fruits in general can induce weight loss. It's thought that calories are either broken down into food for your muscles or released through the natural metabolic process. So instead of cream or sugar, try putting lemon in your future cups of Tea instead. Unlike the effects of coffee, EGT relaxes and soothes the body almost instantly. It also has a stress relief effect whilst simultaneously providing the same clarity and focus as coffee. This makes it the perfect alternative for those who don't want to get overly wired from coffee. The bergamot found within EG is said to improve the immune system as well as cure fevers. As such, it's considered to be a natural cold remedy. Unlike the dehydrating properties of coffee, EGT helps us stay hydrated and maintains the body's fluid balance because of its high K content.

4. Conclusion

There is increasing epidemiological evidence for the beneficial health effects of regular intake of fruits and vegetables as part of a healthier diet. Bergamot, be it from the bergamot orange or from the unrelated herb known as wild bergamot, offers many health benefits. They have a pleasant orange-blossom fragrance that, studies have shown, calm anxiety and depression. Both aid in digestive ailments, but only the bergamot orange peel provides high amounts of antioxidants and antimicrobial properties. One of the most common Teas containing bergamot oil, obtained from the bergamot orange peel, is Earl Grey. EGT has been known to improve digestion. It aids in the digestive process and helps relieve painful indigestion, colic and nausea. It is also used to treat intestinal problems such as worms. Because it helps the digestive process, it can also help to keep you regular. The bergamot in EGT has been known to have a calming effect on people, as well as to boost a person's mood. This is due to bergamot's natural

aromatherapy qualities. In this way EG is a good natural solution for people suffering from depression, stress and anxiety. The essential oil of the orange skin is a valuable ingredient in various perfumes. But researchers over the past decade or more have turned their attention to other uses of bergamot, namely as a cholesterol-lowering ingredient. EBO boasts of powerful antibacterial, analgesic, antiseptic, antispasmodic, and soothing effects. Acne, abscesses, anxiety, boils, cold sores, cystitis, depression, halitosis, itching, loss of appetite, oily skin, psoriasis and stress are some of the prominent benefits bestowed by EBO. Also, it is used in folk medicine to cool fevers and expel intestinal worms.

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