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Myrtus Communis Linn and its Potential Health Effects: A Review

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Abstract

The communal Myrtus of Linn (Myrtus communis L.) can be defined as one of the most potent medicinal plants in the world is (family: Myrtaceae). The Mediterranean and Middle Eastern regions are home to the common myrtle, Myrtus communis L. The fruit of the myrtle has a distinct flavor and comes in either black or white. It is frequently used to treat a variety of ailments, including gastric ulcers, diarrhea, dysentery, vomiting, rheumatism, bleeding, deep sinusitis, leucorrhoea, and cosmetic issues including hair loss. Wine and cuisine are flavored with the blades, berries, and branches. Due to its high vitamin content, mature fruits were once utilized as a food integrator. It has been demonstrated in numerous studies that the myrtle plant's various parts contain a variety of bioactive substances. The plant's fruit and leaves both contain phenolic chemicals and anthocyanin, as well as quercetin, catechin, and myricetin. Numerous biologically active compounds are produced by the plant, including tannins, flavonoids, coumarins, strong oil, essential oils, fibers, carbohydrates, citric acid, malic acid, and antioxidants. The bioactive chemicals found in various myrtle plant sections are regarded to have beneficial benefits on health. According to earlier research, the plant has antioxidant, antibacterial, antidiabetic, anti-inflammatory, anti-ulcerative, anti-diarrheal, analgesic, and hair-growing properties. More human researches are required because it has been shown that the majority of these investigations are conducted on animals.

Keywords Myrtus communis Linn; antioxidant activity, antidiabetic and anti-inflammatory activity, antiulcerative and antidiarrheal activity; analgesic effect and effect on hair growth

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List of abbreviations: DPPH = 1, 1-diphenyl-2-picrylhydrazyl, ALT = Alanine transaminase, ALP = Alkaline phosphatase, AST = Aspartate aminotransferase, ATP = Adenosine triphosphate, GERD = Gastroesophageal reflux disease, GIS = Gastrointestinal system, H_2O_2 = Hydrogen peroxide, Myrtus communis Linn = Myrtus communis L, t-BOOH = Tert-butyl hydroperoxide

Introduction

Myrtus communis Linn (Myrtus communis L.), also referred to as myrtle, is a genus of flowering plants in the family Myrtaceae that Linnaeus first described in 1753. Is a blooming shrub that thrives in the Middle East and the Mediterranean region [1,2]. It can be found in the wild in nations including Turkey, Iraq, Iran, and Syria as well as in Africa, Europe, and Asia [3]. Communist mysticism Linn is a perennially green, fragrant shrub that is grown in gardens and in the wild in Iraq. The plant has tiny green leaves and is between 1.8 and 2.4 meters long. The myrtle fruit has a distinct flavor, can be either black or white, and is covered in a waxy covering as shown in figure (1). Myrtle has apparently been consumed or used as a spice since the dawn of time to treat a number of conditions, including urethritis, conjunctivitis, lung, and skin issues, as well as bleeding, headaches, palpitations, and gastric ulcers [4,5-8]. Essential oils made from various plant parts have long been used in research and industry,

including aromatherapy, phytotherapy, cosmetics, medicine, and the food business [9]. Many different biological processes are carried out by plant parts and essential oils [10].

Figure 1. Fruit and branches of Myrtus communis [11]

Myrtle's nutritional profile

The same chemicals are present in varying degrees in extracts made from different plant sections. The myrtle's leaves include myricetin, catechin, and quercetin [12]. Myrtle fruit is primarily composed of phenolic acids and anthocyanins, two beneficial substances [1,13]. The dark blue fruit of the myrtle has substantial antioxidant activity while the white fruit of the myrtle mostly contains unsaturated fatty acids including myrtenyl acetate, linoleic acid, and oleic acid [5]. The myrtle berries had 11.21 kcal/g, 4.17%, 17.41%, 2.37%, 8.64%, and 76.11 mg/100 g of calories, protein, fiber, fat, sugar, tannin, and essential oil, respectively [14]. The predominant fatty acids in myrtle berries are 72.1% oleic acid and 15.7% palmitic acid, making up 74.1% of the unsaturated fats and 25.7% of the saturated fats. Various polyphenolic chemicals can be found in myrtle. Linalool (8.3%), 1,8-cineol (24.6%), limonene (14.8%), and -pinene (31.8%) are all present in the leaf essential oil [15]. Its berries include ellagic acid (54.64%), gallic acid (12.70%), quercetin (3.72%), and quercetin 3-O-rhamnoside (3.71%) among other polyphenols [16]. The myrtle plant's phytochemical richness has led to speculation that it has advantageous health effects [13]. Figure (2) depicts the possible health benefits of the myrtle and its components based on data from in vitro and in animal studies.

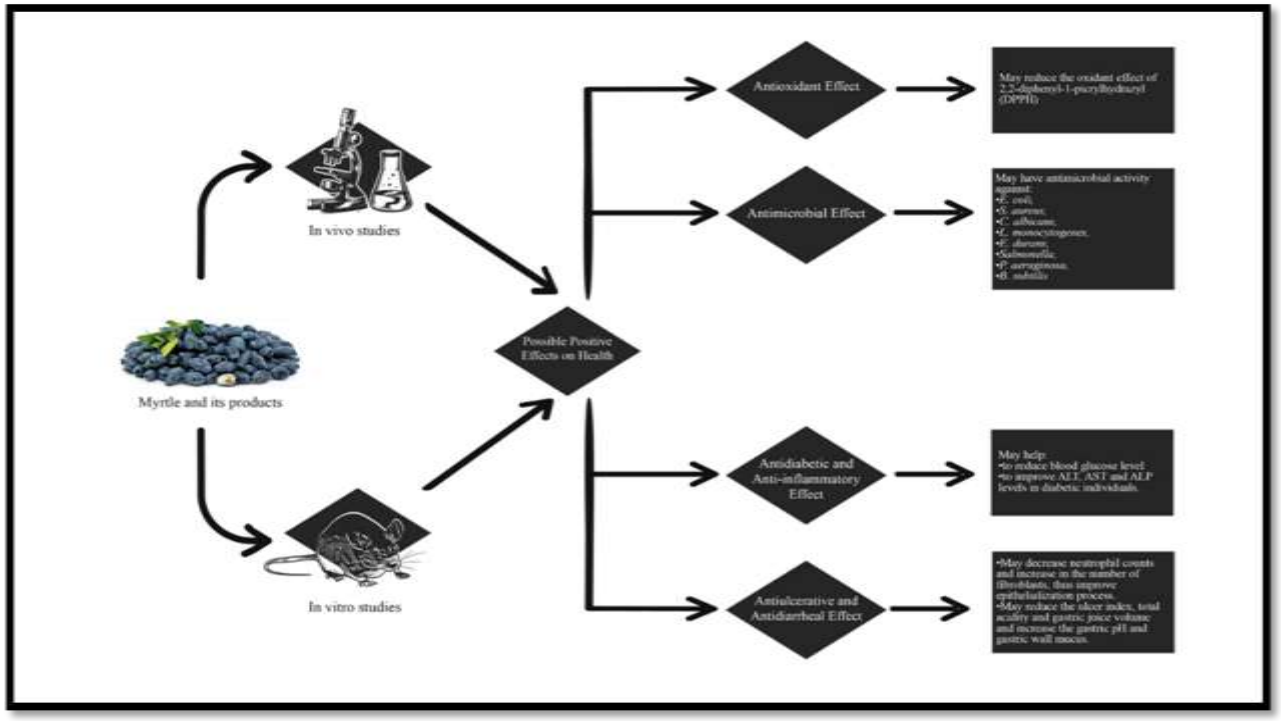

Figure 2. According to data from in vitro and in vivo research, myrtle and its compounds may have good effects on health [17]

Antioxidant activity of myrtle

In order to produce energy, the cell consumes oxygen, and the creation of adenosine triphosphate (ATP) results in the generation of free radicals. Usually, reactive oxygen and nitrogen species are present in these byproducts [18]. These molecules generate oxidative stress when they are present in excessive quantities, which can lead to a variety of chronic diseases as inflammation, diabetes, and atherosclerosis [19]. Anthocyanins are the C15 phenolic glycosides that give plants their color. It has been established that anthocyanins are good for conditions caused by oxidative stress [20]. Studies have demonstrated that myrtle plant essential oils have considerable antioxidant activity [21]. The plant's essential oil lessens the oxidizing effects of 1, 1-diphenyl-2-picrylhydrazyl (DPPH) and the mutagen effects of t-BOOH. Myrtle leaves were used to make the myricetin-3-o-rhamnocide and myricetin-3-o-galactoside, have been shown to have xanthine oxidase activities that prevent lipid peroxidation and DPPH's oxidative effects while blocking the carcinogenic effects of aflatoxin B1, nifuroxazide, and H_2O_2. Aflatoxin B1 and nifuroxazide's genotoxic properties were suppressed by extracts of the myrtle plant in methanol and ethyl acetate [22,23]. A study that compared the antioxidant capacities of white and dark blue myrtle liquors discovered that white liquor contains a higher level of gallic acid and its derivatives [24].

Antidiabetic and anti-inflammatory activity of myrtle

An irregularity in the release of insulin characterizes the metabolic disorder diabetes or hyperglycemia brought on by inadequate insulin. Diabetes-related chronic hyperglycemia can damage or destroy various organs, including the eyes, kidneys, nerves, heart, and blood vessels [25]. Using diabetic rats as test subjects, the myrtle's aqueous extract was found to have anti-diabetic and antioxidant properties. The serum glucose, aspartate aminotransferase (AST), alanine transaminase

(ALT), and alkaline phosphatase (ALP) levels of diabetic mice that ingested 1000 mg/kg of myrtle aqueous extract for 14 days were significantly lower than those of the control group. It was found that aqueous myrtle extract significantly reduced malondialdehyde levels, raised glutathione levels, and superoxide dismutase activity in diabetic rats as compared to the control group [26]. According to a study done on mice, myrtle may have an anti-inflammatory effect on disorders associated with inflammation and reduce edema [27].

Antiulcerative and antidiarrheal activity of myrtle

The mouth is the starting point of the gastrointestinal system (GIS), a long organ that extends for about 10 meters and passes through the chest, belly, and pelvic areas before coming to an end in the anus. The main role of GIS is to convert food nutrients into forms that body cells can use for particular tasks [28]. Anywhere on the GIS mucosa, ulcers can appear as lesions of mucosal tissue that show a slow disintegration of tissue or as a bare wound on the skin [29]. In an animal investigation, it was discovered that the powder made from myrtle berries significantly influences the healing of oral lesions [30]. Discomfort in the intestines brought on by a bacterial or viral infection, drug reaction, food allergy, or systemic sickness are typical signs of diarrhea [31]. An 80% methanol extract of myrtle leaves showed antidiarrheal properties in mice [32]. One of the main chronic gastrointestinal disorders, gastroesophageal reflux disease (GERD), can produce symptoms like chest pain, indigestion, dysphagia, chronic cough, and epigastric pain [33]. Spasm or reduced lower oesophageal relaxation are symptoms of the illness, impairs food absorption in the stomach and causes the contents of the stomach to move toward the oesophagus [34]. In a double-blind, randomized, controlled study, it was found that myrtle syrup reduced disease-induced symptoms in those with gastroesophageal reflux [35].

Analgesic effect of myrtle

Arabic traditional medicine has employed Myrtus communis L. aerial parts as an analgesic [36]. We conducted hot plate and writhing tests to evaluate this activity. In the hot plate test, the aerial portions' aqueous and ethanolic extracts both exhibited notable antinociceptive action, which was reduced by naloxone. The hot plate test is primarily intended to assess central antinociceptive activity, therefore this effect may be mediated by the central opioid receptors or brought on by an increase in endogenous opiopeptide synthesis. The extracts also demonstrated antinociceptive action in a writhing test against acetic acid, which was unaffected by naloxone. These results lead to the hypothesis that the extract's peripheral impact is not mediated by opioid receptors. Hence, it was suggested that there may be additional mechanisms of action, such as reduction of prostaglandin release or suppression of cyclooxygenase [37].

Effect on hair growth of myrtle

In French and Persian traditional medicine, Myrtus communis L. essential oil has been employed as a hair tonic. The effectiveness of using a combination of 100% essential plant oils along with mild electromagnetic pulses to treat androgenetic alopecia was evaluated. Along with other plant essential oils, Myrtus communis L. was present in the solution. By promoting nutritional intake of the hair papilla cells due to the stimulation of the microcirculation and by controlling the activity of sebaceous glands, using the oils alone avoided hair loss and occasionally produced light hair growth. However, the cells were triggered when electromagnetic pulses were used in conjunction with a complementary approach. As a result, the described treatment not only stopped hair loss but also encouraged hair growth. Results revealed that there was an increase in the proliferation index, which was

seen in the immunohistochemical analysis, in addition to an increase in hair density and total hair ratio. Additionally, the expression became more pronounced of the cell proliferation marker Ki67 [38].

Conclusion

As a result of the phytochemical composition, myrtle extracts have antioxidant, antiulcerative, antibacterial, antidiabetic, antiinflammatory, analgesic, and effect on hair development properties. Myrtle eating may therefore be beneficial to health. Due to the fact that the researchers have only found impacts at the cellular level or in animals, their effects on the human body are not fully known. Hence, significant human experimentation is needed.

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