

Using Medicinal Plants for Toothache

Mohammed Sayed Aly Mohammed*

Medicinal and Aromatic Plants Researches Department, Pharmaceutical and Drug Industries Researches Institute National Research Center Cairo, Egypt.

*Correspondence:

Mohammed Sayed Aly Mohammed, Medicinal and Aromatic Plants Researches Department, Pharmaceutical and Drug Industries Researches Institute National Research Center Cairo, Egypt, Tel :+(202)3371564, Fax, + (202)33370931.

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ABSTRACT

Toothache is a common problem occurring in the human population throughout the whole world. Toothache defined as an orofacial pain caused from a dental element or adjacent structures in consequence of several diseases or conditions, such as dental caries, periodontal disease, trauma, occlusal dysfunction, and abscess. There other factors behind toothache include tooth decay or fracture, abscessed tooth, and infected gums. There many species of bacteria inhabit the oral cavity such as toothache disease. Medicinal plants used as traditional treatments for numerous human diseases for thousands years in the world. Using of traditional medicine continues to expand rapidly across the world. In Africa, the dependence on traditional medicine to cure for many diseases such as toothache, and a shortage of drugs. Numerous reports published of the use of traditional plants and natural products for the treatment of toothaches. Effect of medicinal plants return to many parts such as leaves, roots, seeds and flower to toothache. The present review article cleared some traditional medicinal plants for toothache disease in the treatment of toothache.

Keywords

Toothache, Orofacial pain, Dental caries, Periodontal disease, Oral bacteria.

Introduction

The use of medicinal plants has a long history in dental practice; medicinal plants used worldwide [1]. Use of traditional plants and natural products published in numerous reports for the treatment of toothaches. Herbal extracts used in dentistry for reducing inflammation, for inhibiting the growth of oral pathogens, preventing the release of histamine, and as antiseptics, antioxidants, and analgesics [2]. Different phytochemical studies conducted on medicinal plants traditionally used for toothaches proved the presence of active compounds against oral pathogens. However, many studies cleared the activity of traditional medicinal plants against oral pathogens by the examination of crude extracts [2].

Medicinal plants are widely used in dental practices. The World Health Organization reported that between 65% and 80% of the population in developing countries use them to reduce

inflammation inhibit oral pathogen growth, and trigger anti-inflammatory, antiseptic, antioxidant, and analgesic effects [3]. According to many phytochemical studies conducted on these plants, have important ingredients such as flavonoids, alkaloids, and terpenes, which reduce toothache through their mechanism of action [4].

As mentioned above, plants used to treat diseases through phototherapy, using either the entire plant or a desired percentage of its components. The most commonly used parts of medicinal plants are the leaves, seeds, flowers, and roots. The roots, in particular, are highly important because they are higher in bioactive compound content than other plant parts [5].

Allium sativa

Garlic (*Allium sativa* L.) is a bulbous flowering plant belongs to the family of Amaryllidaceae. Garlic and its products used for culinary and therapeutic purposes in many countries. Bulbs of raw garlic investigated for their role in oral health. Bulbs contain biologically active compounds such as alliin, allicin, methiin, S-allylcysteine,

diallyl sulfide, S-ally-mercapto cysteine, diallyl disulphide, diallyl trisulfide and methyl allyl disulphide. It known to humankind for many ages for its bioceutical properties. Garlic is an important crop in the Mediterranean region particularly Africa.

According to a clinical trial reported by Mann [6], that *Allium sativa* reduced the periodontitis level as comparing with the placebo group. Garlic has greatest effect as anti-inflammatory, antioxidant, antibacterial, antiviral, antifungal and antimutagenic properties [7], they added that play a significant role in alleviating various oral diseases like dental plaque. Extraction of the bulbs gave the phytochemicals such as, carbohydrate, total protein, alkaloids, saponins, flavonoids, tannins and steroids. However, the ethanol extract produce flavonoids, however acetone extract appears alkaloids, saponins and tannins.

Water extract showed the presence of another phytochemicals such as, carbohydrates, total protein, saponins and tannins. These bioactive compounds were highly responsible for the biological activity [8], illustrated that phytochemicals have available antibacterial activity of plant extract. In addition, [9] cleared that Allicin is an important antimicrobial compounds of *A. sativum*, and indicated antimicrobial property of allicin against pathogenic organisms.

Clove

The clove (*Eugenia caryophyllata*) belongs to Myrtaceae family and cultivated in many countries. Some components of clove have bacterial and fungal infections [10]. The extracts of this plant has benefits against oral bacteria especially which accompanied with dental caries and periodontal diseases [11]. Clove bud oil is antibacterial, antioxidant and antimicrobial [12], illustrated that Clove essential oil has a large amount of eugenol, which has antimicrobial characteristics.

Syzygium arometicum commonly known as Clove. Clove has extensively used in Ayurveda. It used traditionally for the treatment of tooth pain, in addition, it contains eugenol which has healing properties and soothes the nerves that reside inside the tooth. Clove used medicine and dentistry where the essential oil used as an anodyne painkiller for dental emergencies [13], revealed that Clove considered important medicinal plant according to the wide range of pharmacological effects from traditional use for many centuries.

Datura stramonium

Datura stramonium is one of the widely known as folklore medicinal herbs. It has medicinal properties and great pharmacological potential with a greatest usage in folklore medicine. It contains alkaloids, tannins, carbohydrates and proteins. There numerous reports referred to traditional plants and natural products for the treatment of toothaches, among of traditional plants *Datura stramonium* used for toothache treatment [14]. The methanol extracts of aerial part of *D. stramonium* showed bactericidal activity against gram positive bacteria in a dose dependent treat [15].

Seeds of *D. stramonium* used in the management of toothache [16]. Ayurveda system of medicine has described *D. stramonium* as a valuable therapy for toothache [17]. Study of purified phytochemicals against oral pathogens cleared those flavonoids, alkaloids, terpenes affected against oral bacteria [18]. In addition [19], illustrated that tropane alkaloids, atropine, and scopolamine of *D. stramonium* affected oral bacteria.

Ginger

Zingiber officinale (ginger) is a rhizomatous plant from the family Zingiberaceae, it cultivated in worldwide. Historically, ginger employed in numerous countries for treatment many ailments [20]. *Zingiber officinale* used in traditional medicine for pharmacological activities such as antimicrobial, and antioxidant [21]. Ginger contains Phenolic compounds and terpenes, which considered main bioactive molecules. The phenolic constituents present in ginger comprise shogaols, paradols, and gingerols. The primary phenolic compounds found in fresh ginger are gingerols, including 6-gingerol, 8-gingerol, and 10-gingerol. With heat treatment or prolonged storage, these gingerols could convert into corresponding shogaols. Additionally, following hydrogenation, these shogaols could further convert into paradols [22].

Numerous studies indicated that ginger extraction affected various oral infections, including those taking part in gingivitis, periodontitis, oral candidiasis, and dental caries [23]. Ginger bioactive compounds such as gingerols, shogaols, paradol, and zingerone showed inhibitory effects on a wide range of microorganisms. In addition to having bactericidal activity, it could also inhibit the growth of bacteria. Its antimicrobial spectrum includes both Gram-positive and Gram-negative bacteria, as well as some fungi. According to previous studies, it specifically has oral pathogens, which include *Streptococcus mutans* and *Enterococcus faecalis* in the group of bacteria, and *Candida albicans* in the case of fungi [24].

In addition, research cleared that the essential oils derived from ginger possess notable antibacterial properties [25]. The effectiveness of ginger extract against multidrug-resistant organisms appeared to be as an alternative to existing antibiotics. Therefore, extensive research conducted on this plant and showed its special effect on oral health and pharmaceutical industries that noticed in recent years [26].

Lavender

Lavender belongs to the Lamiaceae family; *Lavandula angustifolia* is the scientific name for lavender, which used medicinal herbs, [27]. It is cultivated all over the world for its commercial use in many countries. It has antimicrobial effects, [28]. Lavender species used as alternative to some of the synthetic materials in the field of dental sciences. [29], In addition It may use to treat local infections, as an alternative to antibiotics, for reducing dental anxiety, or to prevent the formation of biofilm on teeth. It may use too in oral formulations, Lavender flowers are the source of oil of Lavender and the most important essential oils used in aromatherapy, gaining popularity due to its anxiolytic, analgesic,

and sedative properties [30].

Many research studies confirmed lavender extract's analgesic and anti-anxiety properties and its primary active component, linalool [31], they added that Lavender aromatherapy tested in different clinical and medical settings, and shown that it can reduce the patient's anxiety before for those requiring dental work [32]. Identified that the administration of lavender and orange aromas dramatically reduced anxiety levels and enhanced mood among dental patients.

Mentha piperita L

Mentha piperita L. is important medicinal plant belongs to Family Lamiaceae. It cultivated by the ancient Egyptians and documented in the Icelandic pharmacopoeia of the thirteenth century. The important part is the essential oil, which extracted from the aerial parts flowers and dried leaves. Peppermint oil has menthol smell, *Mentha piperita L.* (peppermint) regarded as one of the best potential sources of biologically active substances for the pharmaceutical industries [33]. Its essential oil has many biological activities such as antioxidant, antimicrobial and antiviral, [34]. *Mentha piperita* used as mouthwashes, dentifrices, anti-bacterial, and anti-fungal [35].

Numerous studies confirmed that mint extracts have anti-inflammatory antibacterial, antiviral, and other effects [36]. The abovementioned curing effects of mints due to the occurrence of pharmaceutically valuable bioactive ingredients. The main volatile components of mint include menthol, menthone, menthyl acetate, menthofuran, and 1,8-cineol and other compounds [37].

Thyme

Flowers of various plants considered of Thyme oil, Thyme belongs to the genus *Thymus*. It used as a therapeutic agent since ancient times. *Thymus* contain numerous molecular species exhibiting have therapeutic properties, which dependent on their biologically active concentrations in oil.

Essential oils are volatile, natural plant extracts containing a complex mixture of terpenoids, phenylpropanoids, hydrocarbons and other aromatic compounds [38]. Many essential oils have broad-spectrum antimicrobial properties [39]. Thyme oil, has demonstrated strong bactericidal effects due to its high content of thymol and carvacrol [40], The incorporation of essential oils into dental materials could inhibit bacterial growth and reduce biofilm formation [41]. *Thymus vulgaris* has a range of therapeutic properties that include antimicrobial [42].

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