

Role of Ginger in Medicine and Dentistry- An Interesting Review Article

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Abstract

Ginger is a natural herb used in our day to day life. It has potential health benefits which are yet to be explored. Its potential properties are known in natural medicine for thousands of years. Its use is more popular in south East Asia as a kitchen spice. Its uses are reported in many respiratory, digestive and inflammatory disorders. Uses of ginger in dentistry are minimal but significant. This review furnishes the niceties concerning the uses of ginger in oral care.

Keywords: Ginger, Dentistry, inflammation

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Introduction: Ginger is used worldwide as a cooking spice, condiment and herbal remedy. The Chinese have used ginger for at least 2500 years as a digestive aid and anti-nausea remedy and to treat bleeding disorders and rheumatism; it was also used to treat baldness, toothache, snakebite, and respiratory conditions. In Traditional Chinese Medicine (TCM), ginger is considered a pungent, dry, warming, yang herb to be used for ailments triggered by

cold, damp weather. Ginger is used extensively in Ayurveda, the traditional medicine of India, to block excessive clotting (i.e. heart disease), reduce cholesterol and fight arthritis. In Malaysia and Indonesia, ginger soup is given to new mother for 30 days after their delivery to help warm them and to help them sweat out impurities. In Arabian medicine, ginger is considered an aphrodisiac. Some Africans

believe that eating ginger regularly will help repel mosquitoes.^[1] (Kemper., 1999)

Constituents: The content of the active principles is not uniform and can vary significantly between plant varieties and regions in which ginger is grown. In some instances, certain commercial preparations made from ginger are devoid of any medicinal activity, as the plant's essential components have been extracted before packaging.^[2] (Stuart., 2005)

- Volatile oil (zingiberene, zingiberol, D-camphor)
- Shogaols
- Diarylheptanoids (gingerenones, A and B)
- Gingerols.

Properties: Ginger oil represents 3 percent of the ginger plant, and it is the oil that causes the spicy fragrance. Recent studies show that ginger has strong antioxidant properties. In addition, ginger reduces inflammation by inhibiting prostaglandin biosynthesis, specifically cyclooxygenase-1 and cyclooxygenase-2. These effects make ginger comparable to

those of non-steroidal anti-inflammatory medications although ginger does not cause the side effects characteristic of non-steroidal anti-inflammatory medications. Ginger also suppresses the immune system's production of proinflammatory cytokines and chemokines, reducing disease severity in patients with rheumatoid arthritis.^[3]

Medical uses:

- Antiemetic during pregnancy^[4], antiemetic during chemotherapy^[5], postoperative nausea and vomiting atleast 1 g of ginger^[6]
- Motion sickness by preventing the development of gastric dysrhythmias and the elevation of plasma vasopressin.^[7]
- Powdered root of ginger in daily doses of 1 g in Hyperemesis gravidarum^[8]
- Hypoglycemic, hypocholesterolaemic and hypolipidaemic potential and reversing the diabetic proteinuria^[9]
- To stimulate the appetite^[10]
- To improve digestion and for treatment of indigestion, Piles, Cholera, Colicky

pain, Asthma, Ear ache, Jaundice, ascites, Cardiac disorders^[11]

- Blood thinner, Rheumatoid arthritis, To improve blood circulation, Expectorants^[12]
- Hypertension^[13]
- Analgesics, antipyretics, sedative, Antibacterial^[14]
- Chemoprotective^[15]
- Migraine and headache^[16]
- Gastric ulcers, Antioxidants^[17]

Uses of ginger in dentistry:

For treatment of tooth ache^[11]

As a sialogogue, to promote salivation^[18]

Oral thrush: The study based on laboratory investigations to investigate the antifungal activity of zingiber officinale (Ginger) on *Candida albicans*. *Candida albicans* (PTCC 5027, ATCC10231) was obtained from Iranian microbial collection and was confirmed by Germ Tube formation test. Ethanol ginger extract was prepared. The results showed that the ethanol extract was effective on *Candida albicans* (2 mg mL⁻¹) at the concentration of 1:5. The study indicates

that ginger extract might have promise in treatment of oral candidiasis^[19]

Anticancer: Phenolic compound, [6]-paradol, derived from ginger root and certain zingiberaceae plants, protected mouse skin from a tumor inducing agent, and showed dose-dependent cytotoxicity in an oral carcinoma cell line (KB), with specific features of caspase-3-mediated apoptosis. Viable KB cells were reduced in number to less than 50% of untreated control when incubated with 50 μM [6]-paradol for 48 h. In addition, an ethanol extract of ginger mediated anti-tumor promoting effects, decreased the number of tumors in a Sencar mice skin tumor model^[20]

Herpes simplex infection:

Acyclovir-resistant clinical isolates of herpes simplex virus type 1 (HSV-1) were analyzed in vitro for their susceptibilities to essential oils of ginger, thyme, hyssop, and sandalwood. The active components of essential oils might consist of lipophilic carbohydrates that interact with the lipid membrane. These antibacterial

active substances might exhibit similar activities against viral envelopes. Acyclovir-resistant clinical isolates were significantly inhibited by the essential oils, and the titers of HSV were reduced by 95.9% to 99.9%. Essential oils act by inactivating HSV before it enters the cell. The effective dosage for a systemic application of essential oils is rather high and leads to cytotoxic effects. Furthermore, a short-term systemic bioavailability makes a systemic application unlikely^[21] Aqueous ginger extracts which was used to check antimicrobial activity found to be efficient^[22]

Dosage : Ginger is commonly found in 500 mg (0.5 gram) capsules. The daily dose should not exceed 4 grams of fresh root or 3.0 ml of tincture. For arthritis pain, 2-4 grams of ginger juice or powder can be used daily. Ginger can also be used as a compress or paste and applied directly to inflamed joints. For colds, menstrual cramps, and headache 2 tbsp or several slices of fresh ginger can be added to boiled water can be consumed 2-3 times daily. Fresh ginger root can also be sliced and steamed and the vapors inhaled. For nausea and indigestion,

2-4 grams of ginger can be used daily. Alternately a 1/4 oz piece of raw or crystallized ginger can be chewed. As with many herbal preparations, it can take up to two months before the full effects are noticed^[3] (Moore., 2006).

Side Effects and Interactions:^[3]

- Because ginger can interfere with blood clotting, it should be used cautiously in patients on anticoagulant therapies such as coumadin or heparin.
- Ginger may reduce the toxic effects of the chemotherapeutic agent cyclophosphamide.
- Although ginger is very effective for nausea and morning sickness and is used to reduce the effects of several chemotherapeutic agents, the use of ginger capsules is not recommended for pregnancy.
- Ginger is also contraindicated in patients with biliary disease because of its tendency to cause bile release from the gallbladder.

Conclusion: This review gives a bird's eye view of the uses of ginger in dentistry. Even though the known uses are minimal, further research on this herb is required to know its potential benefits in both Medicine and Dentistry.

References:

1. KemperKJ.<http://www.longwoodherbal.org/ginger/ginger.pdf> (Accessed on 9th Oct, 2012).
2. StuartAG.<http://www.herbalsafety.utep.edu/herbs-pdfs/ginger.pdf> (Accessed on 9th Oct, 2012).
3. MooreE.<http://suite101.com/article/ginger-in-autoimmune-disease-a7745> (Accessed on 9th Oct, 2012).
4. Betz O, Kranke P, Geldner G, Wulf H, Eberhart LH. [Is ginger a clinically relevant antiemetic? A systematic review of randomized controlled trials]. *Forsch Komplementarmed Klass Naturheilkd.* 2005;12(1):14-23.
5. Sontakke S, Thawani V, Naik MS. Ginger as an antiemetic in nausea and vomiting induced by Chemotherapy: a randomized, cross-over, double blind study. *Indian Journal of Pharmacology* 2003;35:32-36.
6. Chaiyakunapruk N, Kitikannakorn N, Nathisuwan S, Leepakoboon K, Leelasattagool C. The efficacy of ginger for the prevention of postoperative nausea and vomiting: a meta-analysis. *Am J Obstet Gynecol.* 2006;194(1):95-9.
7. Lien HC, Sun WM, Chen YH, et al. Effects of ginger on motion sickness and gastric slow-wave dysrhythmias induced by circularvection. *Am J Physiol Gastrointest Liver Physiol.* 2003;284(3):481-489.
8. Fischer-Rasmussen W, Kjaer SK, Dahl C, Asping U. Ginger treatment of hyperemesis gravidarum. *Eur J Obstet Gynecol Reprod Biol.* 1991;38(1):19-24.
9. Al-Amin ZM, Thomson M, Al-Qattan KK, Peltonen-Shalaby R, Ali M. Anti-diabetic and hypolipidaemic properties of ginger (*Zingiber officinale*) in streptozotocin-induced diabetic rats. *Br J Nutr.* 2006;96(4):660-6.

10. <http://www.n8ture.com/herbs-ginger.html>
11. Babu S, Madhavi M (2003). Green Remedies healing powers of herbs. 1st ed, Pustak Mahal. Delhi.
12. Todd JC. Herbal Home Remedies (2004). 1st ed, Jain Publishers. New Delhi.
13. Bode AM, Dong Z (2011). The Amazing and Mighty Ginger. In: Benzie IFF, Wachtel-Galor S, editors. Herbal Medicine: Biomolecular and Clinical Aspects. 2nd edition. Boca Raton (FL): CRC Press.
14. Rehman R, Akram M, Akhtar N, Jabeen Q, Saeed T, Shah SMA et al. Zingiber officinale Roscoe (pharmacological activity). Journal of Medicinal Plants Research 2011;5(3):344-348
15. Baliga MS, Haniadka R, Pereira MM, D'Souza JJ, Pallaty PL, Bhat HP et al. Update on the chemopreventive effects of ginger and its phytochemicals. Crit Rev Food Sci Nutr. 2011;51(6):499-523.
16. Cady RK, Goldstein J, Nett R, Mitchell R, Beach ME, Browning R. A double-blind placebo-controlled pilot study of sublingual feverfew and ginger (LipiGesic™ M) in the treatment of migraine. Headache. 2011;51(7):1078-86.
17. Singh PK, Kaur IP. Synbiotic (probiotic and ginger extract) loaded floating beads: a novel therapeutic option in an experimental paradigm of gastric ulcer. J Pharm Pharmacol. 2012;64(2):207-17.
18. O'Hara M, Keifer D, Farrel K, Kemper. K. A review of 12 commonly used medicinal herbs. Archives. Fam. Med. 1998;7:523-536.
19. Atai Z. Inhibitory Effect of Ginger Extract on Candida albicans. American Journal of Applied Sciences 2009;6:1067-9.
20. Hsu S, Singh B, Schuster G. Induction of apoptosis in oral cancer cells: agents and mechanisms for potential therapy and prevention. Oral Oncol. 2004;40(5):461-73.

21. Schnitzler.P, Koch.C, Reichling.J.
Susceptibility of Drug-Resistant
Clinical Herpes Simplex Virus Type
1 Strains to Essential Oils of Ginger,
Thyme, Hyssop, and Sandalwood
Antimicrob Agents Chemother.
2007;51:1859–62.

22. Patel RV, Thaker VT, Patel VK.
Antimicrobial activity of ginger and
honey on isolates of extracted
cariou teeth during orthodontic
treatment. Asian Pacific Journal of
Tropical Biomedicine 2011;S58-S61

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