

Investigation on Ethnomedicinal values of *Zingiber OfficinaleRoscoe*. - A Remedial Plant

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ABSTRACT

All the plants growing on this earth have their specific values. The traditional or herbal utilization of ethnomedicinal importance of Zingiber OfficinaleRoscoe are very beneficial for human being. Zingiber OfficinaleRoscoe belongs to Zingiberaceae family. It's a perennial creeping in plant having thick tuberous rhizome, long leaves, and yellow green flowers. This can be classified as a type of storage root which is having pungent taste. It is one of the famous species across the world. From traditional treatment and prevention of a number of diseases and conditions that reduce inflammation and pain in joints, migraine, antiseptic, bactericidal, headaches, carminative, nausea, analgesic, antispasmodic, tonic, anti-emetic, stimulant, cephalic, stomachic, expectorant, febrifuge, laxative, rubefacient, and sudorific. The ginger's medicinal properties and its knowledge deliver a very good platform for investigators and researchers for future aspect of Zingiber OfficinaleRoscoe.

Keywords: *Zingiber OfficinaleRoscoe, Ethnomedicinal, Diseases.*

I. Introduction

Zingiber OfficinaleRoscoe widely known as Ginger in English language which is native to India and in old says, Arabs used to import dried Ginger (Urdu-Sonth) from India which they called as ZanjabilYabis. The word in Arabic, "Zanjabil" is supposed to be derived from Sanskrit word "Sringeber". Maulana Syed SulaimanNadvi had stated that "For us (Indian), it is a matter of great pride that there are some fortunate words of our country which have been found a place in the holy Quran. There cannot be any doubt that the three fragrances of our paradise (India) have been referred to in connection with the paradise (of ALLAH) and these are Misk, Zanjabil and Kafur." Thus, according to Maulana Nadvi, these three words have been derived from Indian words of Mushk, Sringevera (Jaranjbera) and Karpura (Kapur) respectively. Similar views have been expressed by Zubair Siqui. He has written that apart from Zanjabil and Kafur, another Quranic word Tuba has been derived from Sanskrit word Tupa.

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The taxonomy (Scientific Classification) of *Zingiber OfficinaleRoscoe* is defined as follows:

Kingdom	:	Plantae
Division	:	Magnoliophyta
Class	:	Liliopsida
Order	:	Zingiberales
Genus	:	Zingiber
Species	:	<i>Zingiber OfficinaleRoscoe</i>
English Name	:	Ginger
Arabic Name	:	Zanjabil (Tradition) / Janzbil



Rhizomes of *ZingiberOfficinaleRoscoe*

Z. OfficinaleRoscoe rhizomes are very effective stimulant and carminative. These are used for flavoring food and also given in diarrhea and colic. Arabs during the days of the prophet were very fond of *Z. OfficinaleRoscoe* and, therefore, used to mix it in water meant for drinking.

Avicenna has attributed aphrodisiacal properties of Ginger along with other medicinal properties. Gaten has recommended its use in the Paralysis cases and all complaints arising from Cold Humors. *Z. OfficinaleRoscoe* juice is said to be useful in early stages of liver cirrhosis and also in diabetes.

Z. OfficinaleRoscoe, the rhizomes of the plant of the family of Zingiberaceae. It's a wonderful plant product which is commonly used across the world. The plant grows to about 3-4 feet high with a thick spreading tuberous rhizome. The plant is perennial herb. Important constituents of essential oil of *Z. OfficinaleRoscoe* (2-4%) are camphene, geraniol, phellandrene, α -zingiberene, cineole, linalool, nerol, neral, camphene, α -pinene, β -pinene, borneol, 1,8-cineole, β -bisabolene, and geranyl acetate. This also contains the oleoresins named as Gingerin. The *Z. OfficinaleRoscoe* oil & *Z. OfficinaleRoscoe* oleoresin and also the preserved *Z. OfficinaleRoscoe* have become important items in the international trade. These are used in drinks and food preparations like *Z. OfficinaleRoscoe* bread, biscuits, pastries, pickles, condiments, curries, beer, conserves, syrups, etc.

Objective

1. To understand and stimulate the ethnomedicinal importance of *Z. OfficinaleRoscoe* which is used to prevent and/or treatment of several human diseases.
2. To support the traditional knowledge of Medicinal plants.
3. To emphasize the Ethnomedicinal values of *Z. OfficinaleRoscoe*.
4. To focus on the several uses of *Z. OfficinaleRoscoe* for health to human being.
5. To reflect the applications of *Z. OfficinaleRoscoe* as herbal therapy.

II. Methods

The data for current investigation were collected from the firsthand information through NBRI (National Botanical Research Institute), Lucknow and Herbal garden of Jamia Hamdard, Delhi. The study was carried out in 2018 using standard ethnobotanical research approach through field survey using pre-structured questionnaire methods. Traditional healers who practice herbal treatments for human ailment over an extended period were considered as a source of data for this study. Detailed information about the availability of different products of *Z. OfficinaleRoscoe* and people's preferences of its uses in various Unani medicines, used mostly by different community. It was gathered through in-depth discussion with key knowledge holders. Personal interviews were carried out by some Hakim, Vaidya, Unani and Ayurvedic doctors. The information about the traditional knowledge of *Z. OfficinaleRoscoe* also gathered from the available literature in the university library and from the websites. Information on searching key words, databases, articles and various journals books were explored while writing of ethno-medicinal values and importance of *Z. OfficinaleRoscoe*.

Brief Description of Zingiber OfficinaleRoscoe

Z. OfficinaleRoscoe is highly digestive because it is stimulant to gastro-intestinal tract. It is extremely beneficial in vomiting spasm, flatulence, dyspepsia, colic, and other pain of the stomach and asthma.

Z. OfficinaleRoscoe juice with dissolved rock salt and lemon juice, is very useful in loss of appetite when it is taken before meals. Also, this is prescribed for cases of delirium and biliousness. Chewing a piece of *Z. OfficinaleRoscoe* helps to relaxed sore throat hoarseness and benefit in loss of voice. So, it is helpful in the excretion of saliva and its copious flow. *Z. OfficinaleRoscoe* juice is said to be useful in chronic rheumatism, early stages of liver cirrhosis and also in diabetes. The application of a paste of dried *Z. OfficinaleRoscoe*. Relieves neuralgic headaches and tooth aches.

Applications of *Z. OfficinaleRoscoe* as Herbal Therapy

- Active principles of *Z. OfficinaleRoscoe* acts directly on gastro intestinal tract, resulting to fight against nausea and vomiting (antiemetic) during motion sickness and seasickness (langner et al. 1998) apparently, which is not mediated through the central nervous system (CNS).
- To lessen the vomiting of patients who are treated with cytotoxic compound.
- To act as an anti-flatulent or carminative to reduce gas and bloating
- To promote the digestion.
- To improve the circulation of blood.
- In the treatment of diabetes, it serves as to lower the blood glucose.
- Migraine headache is treated.
- As a Sialagogue, to promote the salivation.

Scientific medicinal values of *Z. OfficinaleRoscoe*

1. Headache: *Z. OfficinaleRoscoe* is generally used for treatment of headache and also exhibiting reduction of pain symptoms. The decrease in prostaglandin synthesis is the cause for the effect of reduction in pain symptom. It has been reported that *Z. OfficinaleRoscoe* suppresses leukotriene biosynthesis by inhibiting 5-lipoxy ganase (Emst and Pittler 2004; Tjendraputra et al., 2001; Nasri et al; 2013)

2. Cardiovascular effects: The various studies of the *Z. OfficinaleRoscoe* exhibited that the important constituents of ginger namely gingerol and shogaol classes of compounds might be having numerous healing effects including hypo-cholesterolemic, anti-inflammatory, and antioxidant effects.

Z. OfficinaleRoscoe helps in stimulation of the heart muscle and dilutes circulating blood which improves blood circulation throughout the body. This improves cellular metabolism which is helpful in relieving cramp and tension (Chaiyakunapruk et al., 2006; Frisch et al., 1995; Gong et al., 1989; Ernst and Pittler, 2000; Yamahara et al., 1989; Pecoraro et al., 1998).

3. Hypotensive effect: Large number of studies has been carried out which demonstrate hypotensive effect of *Z. OfficinaleRoscoe* when it is given at 0.3-3 mg/kg. It aids in the reduction of atrial blood pressure by acting on muscarinic receptor or by blocking calcium channel (Vutyavanich et al., 2001; Portoni et al., 2003; Portoni et al., 2003; Ernst and Pittler, 2004; Ozgoli and Goli, 2009).

4. Antiemetic effect of *Z. OfficinaleRoscoe*: *Z. OfficinaleRoscoe* displays robust antiemetic property by inhibiting serotonin receptors and enhancing intestinal motility. It stimulates peripheral anti-

histaminic receptors, anti-cholinergic receptor and antagonises 5-hydroxytryptamine receptors in the GUT (Halvorsen et al., 2002; Dugasani et al., 2010; Gull et al., 2012; Lumb, 1994).

5. Anti-hypercholesterolaemic effect: *Z. OfficinaleRoscoe* extracts decreases cholesterol levels due to its interference with cholesterol biosynthesis. *Z. OfficinaleRoscoe* extracts also exhibits antilipidemic effects, by reducing thermogenesis and high lipids levels. It similarly benefits to surge serum HDL-cholesterol (Al-Awwadi, 2010; 2013; Ozgoli and Goli, 2009; Ernst and Pittler, 2004; Vutyavanich et al., 2001; Portoni et al., 2003).

6. Morning sickness: FDA (Food Drugs, and Cosmetic Act) stated that *Z. OfficinaleRoscoe* is safe for the morning sickness treatment. It is also widely used during early pregnancy. It decreases morning sickness symptoms if same is taken in the recommended amount. But, Europe and The German Commission doesn't consider it as safe because of the lack of published data (Kyung et al., 2006; Nasri et al., 2013; El-Sharaky et al., 2009; El-Abhar et al., 2008; Ajith et al., 2008.)

7. Antifungal: The main anti-fungal principles are Gingerols and Gingerdiol and the extract of *Z. OfficinaleRoscoe* powder is useful against numerous antifungal diseases (Nasri et al., 2013, Ramkissoon et al., 2012; Mallikarjuna et al., 2008; Ernst and Pittler, 2004).

8. Antioxidant: The powerful antioxidant activity of *Z. OfficinaleRoscoe* is due to its oil which has protective effect on DNA damage. This effect has been reflected in many cell culture (Al-Awwadi, 2010; 2013; Mahmoud et al., 2012; Kabuto et al., 2005; Chaiyakunapruk et al., 2006; Ramkissoon et al., 2012).

9. Insulin: Various Studies suggests that *Z. OfficinaleRoscoe* may enhance insulin sensitivity in the body. The mineral element of ginger is effective for the same (Pushpanathan, 2008; El-Abhar et al., 2008; El-Sharaky et al., 2009; Choi et al., 2013; Jagetia et al., 2004).

10. Antineoplastic: *Z. OfficinaleRoscoe* is an influential antineoplastic agent. The several studies exhibit that extracts of *Z. OfficinaleRoscoe* act against resistance of cancerous cells and suppress cell proliferation (Saraswat, 2010; Newall et al. 1996; Barnes et al., 2002; Ernst and Pittler, 2000; Kumar et al., 2015; Nasri et al., 2013).

III. Conclusion

Z. OfficinaleRoscoe is considered to be a safe ethnomedicinal and scientific values or importance of herbal for human beings. This paper provides another example to explain the treatment using folk medicine. The present study carried out at NBRI on *Z. OfficinaleRoscoe* and its constituents' effect on human for the treatment of several diseases. *Z. OfficinaleRoscoe*. has many chemical constituents which has been seen in numerous clinical studies, to be useful in combating postoperative vomiting and vomiting of pregnancy. This research paper based on current as well as past research done on *Z. OfficinaleRoscoe* for the various suggestions. It is also observed that *Z. OfficinaleRoscoe* is quite useful in many chronic and acute conditions such as congestive conditions, joint pain asthma, menstrual cramp, nausea, reducing gas, vomiting, so and so. *Z. OfficinaleRoscoe* has been taken daily as a food spice in significant amounts by millions of people across the world.

IV. Recommendations

There is an important role played by *Z. OfficinaleRoscoe* in traditional Indian Ayurvedic medicine. In traditional Indian drinks, *Z. OfficinaleRoscoe* is also used as an ingredient. Thus *Z. OfficinaleRoscoe* is termed as Medicinal plants, which deliver rich source of pharmaceutical intermediates, modern medicines, folk medicines, novel drugs, bioactive principles, food supplements and also lead compound in synthetic drugs. Since ancient times, *Z. OfficinaleRoscoe* has been used as traditional medicine. Medicinal properties of *Z. OfficinaleRoscoe* are considered useful for human beings. The existing pre-clinical information is sufficient to recommend *Zingiber OfficinaleRoscoe* and its extract as complementary treatment option for some diseases of humans particularly in resource poor communities.

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References

1. The treatise on Indian Medicinal Plants, published by National Institute of Science Communication - 1997.
2. Medicinal Plants in the traditions of Prophet Mohammad (PBUH) (Prophetic Medicine) by Dr. M.I.H Farooqui - 2010.
3. Dictionary of Indian Plant Gums, Resins, Dyes & Related Products (Chemistry, Botany & Utilization) by Dr. M.I.H Farooqui - 2008.
4. Notable plants in Ethnomedicine of India, Deep Publications; by Dr.S.K.Jain, B.K.Sinha& R.C. Gupta - 1991.
5. Herbal Medicine (Traditional practices) by P.C. Trivedi - 2006.
6. Medicinal Plants, Chemistry and Properties, Oxford & IBH publishing Co. Pvt. Ltd. New Delhi by M. Daniel – 2008.
7. Medicinal Plants in the traditions of Prophet Mohammad (PBUH) by Dr. M.I.H Farooqui - 2004.
8. Medicinal Plants, Oxford & IBH Publishing Co. Pvt. Ltd. Delhi, by S.G. Joshi - 2013.
9. Plants in Ayurvedic and Unani Medicine by Dr. M.I.H Farooqui - 2013.
10. Afzal M, al-hadidi D, Menon M, Pesek J, Dhama MS., Drug Metab. Drug Interact. 2001,18:159-190.

11. Ernst E, Pittler MH (2004). Randomized controlled trial of ginger to treat nausea and vomiting in pregnancy. *Obstet. Gynecol.* 103(4):639-645.
12. Nasri H, Nematbakhsh M, Ghobadi S, Ansari R, Shahinfard N, Rafieian-Kopaei M (2013). Preventive and curative effects of ginger extract against histopathologic changes of gentamicin-induced tubular toxicity in rats. *Int. J. Prev. Med.* 4(3):316-321.
13. Tjendraputra E, Tran VH, Liu-Brennan D, Roufogalis BD, Duke CC (2001). Effect of ginger constituents and synthetic analogues on cyclooxygenase-2 enzyme in intact cells. *Bioorganic Chem.* 29:156.
14. Gong QM, Wang SL, Gan C (1989). A clinical study on the treatment of acute upper digestive tract hemorrhage with wen-she decoction. *Chung Hsi I Chieh Ho TsaChih* 9:272-273, 260.
15. Pecoraro A, Patel J, Guthrie T, Ndubisi B 1998. Efficacy of ginger as an adjunctive anti-emetic in acute chemotherapy-induced nausea and vomiting. *ASHP Midyear Clinical Meeting.* 33:429.
16. Frisch C, Hasenohrl RU, Mattern CM, Hacker R, Huston JP (1995). Blockade of lithium chloride-induced conditioned place aversion as a test for antiemetic agents: comparison of metoclopramide with combined extracts of *Zingiber officinale* and *Ginkgo biloba*. *Pharmacol. Biochem. Behav.* 52:321-327.
17. Yamahara J, Rong HQ, Iwamoto M, Kobayashi G, Matsuda H, Fujimura H (1989). Active components of ginger exhibiting anti-serotonergic action. *Phytother. Res.* 3:70-71.
18. Ernst E, Pittler MH (2000). Efficacy of ginger for nausea and vomiting: A systematic review of randomized clinical trials. *Br. J. Anaesth.* 84(3):367-371.
19. Chaiyakunapruk N, Kitikannakorn N, Nathisuwan S, Leeprakobboon K, Leelasattagool C (2006). The efficacy of ginger for the prevention of postoperative nausea and vomiting: a meta-analysis. *Am. J. Obstet. Gynecol.* 194(1):95-99.
20. Portoni G, Chng LA, Karimi-Tabesh L, Koren G, Tan MP, Einarson A (2003). Prospective comparative study of the safety and effectiveness of ginger for the treatment of nausea and vomiting in pregnancy. *Am. J. Obstet. Gynecol.* 189(5):1374-1377.
21. Ozgoli G, Goli M 2009. Effects of ginger capsules on pregnancy, nausea, and vomiting. *J Altern Complement Med.* 15(3):243-246.
22. Vutyavanich T, Kraissarin T, Ruangsri RA (2001). Ginger for nausea and vomiting in pregnancy: randomized, double-masked, placebo-controlled trial. *Obstet. Gynecol.* 97:577-82.
23. Lumb AB (1994). Effect of dried ginger on human platelet function. *ThrombHaemost.* 71:110-111.
24. Mahmoud MF, Diaai AA, Ahmed F (2012). Evaluation of the efficacy of ginger, Arabic gum, and *Boswellia* in acute and chronic renal failure.
25. Gull I, Saeed M, Shaukat H, Aslam SM, Samra ZQ, Athar AM (2012). Inhibitory effect of *Allium sativum* and *Zingiber officinale* extracts on clinically important drug resistant pathogenic bacteria. *Ann. Clin. Microbiol. Antimicrob.* 11:8.
26. Dugasani S, Pichika MR, Nadarajah VD, Balijepalli MK, Tandra S, Korlakunta JN (2010). Comparative antioxidant and anti-inflammatory effects of [6]-gingerol, [8]-gingerol, [10]-gingerol and [6]-shogaol. *J. Ethnopharmacol.* 127:515-520.
27. Halvorsen BL, Holte K, Myhrstad MC, Barikmo I, Hvattum E, Remberg SF, Wold AB, Haffner K, Baugerød H, Andersen LF, Moskaug Ø (2002). A systematic screening of total antioxidants in dietary plants.

28. El-Sharaky AS, Newairy AA, Kamel MA (2009). Protective effect of ginger extract against bromobenzene-induced hepatotoxicity in male rats. *Food Chem. Toxicol.* 47(7):1584-1590.
29. El-Abhar HS, Hammad LN, Gawad HS (2008). Modulating effect of ginger extract on rats with ulcerative colitis. *J. Ethnopharmacol.* 118(3):367-172.
30. Kyung KS, Gon JH, Geun KY, Sup JJ, Suk WJ, Ho KJ (2006). 6-Shogaol, a natural product, reduces cell death and restores motor function in rat spinal cord injury. *Eur. J. Neurosci.* 24(4):1042-1052.
31. Ramkissoon JS, Mahomoodally MF, Ahmed N, Subratty AH (2012). Relationship between total phenolic content, antioxidant potential, and antiglycation abilities of common culinary herbs and spices. *J. Med. Food* 15(12):1116-1123.
32. Mallikarjuna K, Sahitya Chetan P, Sathyavelu Reddy K, Rajendra W (2008). Ethanol toxicity: Rehabilitation of hepatic antioxidant defense system with dietary ginger. *Fitoterapia* 79:174-178.
33. Chaiyakunapruk N, Kitikannakorn N, Nathisuwan S, Leeprakobboon K, Leelasattagool C (2006). The efficacy of ginger for the prevention of postoperative nausea and vomiting: a meta-analysis. *Am. J. Obstet. Gynecol.* 194(1):95-99.
34. Kabuto H, Nishizawa M, Tada M, Higashio C, Shishibori T, Kohno M (2005). Zingerone [4-(4-hydroxy-3-methoxyphenyl)-2-butanone] prevents 6-hydroxydopamine-induced dopamine depression in mouse striatum and increases superoxide scavenging activity in serum. *Neurochem. Res.* 30:325-232.
35. Jagetia G, Baliga M, Venkatesh P (2004). Ginger (*Zingiber officinale* Rosc.), a dietary supplement, protects mice against radiation-induced lethality: Mechanism of action. *Cancer Biother Radiopharm.* 19(4):422-435.
36. Choi YY, Kim MH, Hong J, Kim SH, Yang WM (2013). Dried Ginger (*Zingiber officinalis*) Inhibits Inflammation in a Lipopolysaccharide-Induced Mouse Model. *Evidence-Based Complement. Altern. Med.* p914563.
37. Pushpanathan T (2008). The essential oil of *Zingiber officinalis* Linn (*Zingiberaceae*) as a mosquito larvicidal and repellent agent against the filarial vector *Culex quinquefasciatus* Say (Diptera : Culicidae). *Parasitol. Res.* 102(6):1289-1291.
38. Barnes KK, Kolpin DW, Meyer MT, Thurman EM, Furlong ET, Zaugg SD, Barber LB (2002). Water-quality data for pharmaceuticals, hormones, and other organic wastewater contaminants in U.S. streams, 1999-2000: U.S. Geological Survey Open-File Report 02.
39. Newall CA, Anderson LA, Phillipson JD (1996). *Herbal Medicines: A Guide for Healthcare Professionals*. London: Pharmaceutical Press.
40. Kumar A, Goyal R, Kumar S, Jain S, Jain N, Kumar P (2015). Estrogenic and Anti-Alzheimer's studies of *Zingiber officinalis* as well as *Amomum subulatum* Roxb.: the success story of dry techniques. *Med. Chem. Res.* 24(3):1089-1097.
41. Saraswat M (2010). Antiglycating potential of *Zingiber officinalis* and delay of diabetic cataract in rats. *Mol. vision* 16(165-66):1525-1537.
42. Duke JA, Ayensu ES (1985). *Medicinal Plants of China. Medicinal Plants of the World. Vol. 1.* Algonac, MI: Reference Publications, Inc. P 362.
43. Qureshi S, Shah AH, Tariq M, Ageel AM (1989). Studies on Herbal Aphrodisiacs Used In Arab System of Medicine. *Am. J. Chin. Med.* 17:57-63.

44. Al-Awwadi NAJ (2013). Anti diabetics effect of *Achillea santolina* aqueous leaves extract, 4(7):151-156.
45. Al-Awwadi NAJ (2010). Effects of *Achillea Santolina* extracts and fractions on human platelet aggregation in vitro and on rat arteriovenous shunt thrombosis in vivo, Thi-Qar Med. J. (TQMJ) 2010.
46. Ajith TA, Aswathy MS, Hema U (2008). Protective effect of *Zingiber officinale Roscoe* against anticancer drug doxorubicin-induced acute nephrotoxicity. Food Chem. Toxicol. 46(9):3178-81.
47. Langner E, Greifenberg S, Gruenwald J. 1998. Ginger: History and Use. Adv. Ther. 15:25-44.