Ginger as an Alternative Medicine to Urban Population - A Review

Arwankie Shadap¹, Y. A. Lyngdoh² and Shailesh Kumar Singh¹*

¹Department of Horticulture, Lovely Professional University, Phagwara, Punjab - 144 411, India.
²Scientist, IARI, New Delhi, India.

http://dx.doi.org/10.22207/JPaM.12.2.67
(Received: 13 April 2018; accepted: 09 June 2018)

Urbanization with rapid changes in diet and lifestyle in various social classes, and possibly aging of the population seem to be responsible for many common diseases like cardiovascular diseases, respiratory problems, diabetes, cold, flu and cancer as well. In most of the urban diseases stress is a contributing factor and it can aggravate diseases caused due to polluted environment with lead fumes, chlorofluoro carbons, CO₂, hydrocarbons and other green house gases. Ginger is known for its powerful antioxidant, antiviral, anti-inflammatory and antibacterial properties from time immemorial. It has been used in traditional Chinese and Indian medicine (Ayurveda) for over 25 centuries as a digestive aid and anti-nausea remedy, treat bleeding disorders, respiratory conditions, block excessive clotting (i.e. heart disease), reduce cholesterol etc. Hence, it can be used as an alternative medicine with zero side effects to suppress such common urban diseases and reduces stress from busy life. This article furnishes the uses of ginger concerning health care in urban areas.

Keywords: Ginger; Alternative medicine; Urban population.

Populations across India have changed dramatically in the 20th century. Most human societies have moved from agrarian diets and active lives to fast foods and sedentary urban lifestyle, increased alcohol consumption combined with increasing tobacco use and stresses in work place and less physical exercise have fuelled diseases like obesity, diabetes, hypertension and cardiovascular diseases. Environmental pollution in urban areas added to respiratory problems across all age groups (Xavier et al., 2008 and Prabhakaran et al., 2005).

India is a developing country with one of the most diverse populations and diets in the world. Cancer rates in India are rising and the rates of oral and oesophageal cancers are some of the highest in the world (Sinha et al., 2003). Change of diet is among the factors that may be responsible for the changing disease rates. Other common diseases found in urban areas are common cold, flu, digestive problems, inflammatory, fever and many others which are caused due to dirty, unhealthy places in cities which provides breeding ground for many disease causing micro-organisms. In addition, migration and urbanization have resulted in an increase in the prevalence of risk factors such as cancer, diabetes and overweight (Ebrahim et al., 2010). Chakravarthy et al. (2002) reported that the prevalence of asthma and nocturnal cough was significantly higher among urban children in the age group of 6-12 years. Children living in urban areas also reported ‘recent wheeze’ more often than rural children. Chhabra et al. (2008) reported higher prevalence of respiratory diseases in urban area in India. Direct exposure to atmospheric pollutants are major factors which increases cough, cold and allergy remedies in India which is high in urban areas. Childhood migraine is very common in urban areas which is mostly triggered by
environmental (sun exposure, hot humid weather, smoke and noise) and stress related (Chakravarty et al., 2009).

**GINGER – The alternative medicine**

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. 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, 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. Some Africans believe that eating ginger regularly will help repel mosquitoes (Kemper, 1999)

**Ginger chemistry**

In the fresh ginger rhizome, the gingerols were identified as the major active components and gingerol 5-hydroxy-1-(4-hydroxy-3-methoxy phenyl) decan-3-one is the most abundant constituent in the gingerol series. The powdered rhizome contains 3-6% fatty oil, 9% protein, 60-70% carbohydrates, 3-8% crude fiber, about 8% ash, 9-12% water and 2-3% volatile oil. The volatile oil consists of mainly mono and sesquiterpenes; camphene, beta-phellandrene, curcumene, cineole, geranyl acetate, terpeneol, terpenes, borneol, geraniol, limonene, linalool, alpha-zingiberene (30-70%), beta-sesquiphellandrene (15-20%), beta-bisabolene (10-15%) and alpha-farmesene. In dried ginger powder, shogaol a dehydrated product of gingerol, is a predominant pungent constituent up to biosynthesis3-5. Oleoresin, which is isolated by acetone and ethanol extraction, contains 4-7.5% of dried powder, pungent substances namely gingerol, shogaol, zingerone and paradol. The oleoresin has also been found to contain zingiberol, the principal aroma contributing component as well as zingiberene, gingediol, diarylheptanoids, vitamins and phytosterols.

**Ginger against cardiovascular diseases**

In traditional Chinese medicine, ginger is used to improve the flow of body fluids. It stimulates blood circulation throughout the body by powerful stimulatory effect on the heart muscle and by diluting blood (Shoji et al., 1982). The improved circulation is believed to increase the cellular metabolic activity, thus contributing to the relief of cramps and tension. A Japanese study showed that active constituents in ginger reduced the blood pressure and decreased cardiac workload (Tanabe et al., 1993). Ginger reduced the formation of pro-inflammatory prostaglandins and thromboxane thus lowering the clotting ability of the blood (Bordia et al., 1997). Ginger can prevent the increase in cholesterol levels following intake of cholesterol-rich diet (Gujral., et al., 1978).

**Ginger as antioxidants/anti-cancer**

Antioxidants are the chemical substances that reduce or prevent oxidation and have the ability to counteract the damaging effects of free radicals in tissues and thus are believed to protect against cancer, arteriosclerosis, heart disease and several other diseases (Bandyopadhyay et al., 2007). About 40 antioxidant compounds have been discovered in ginger. Some of them would be heat-proof and could even be released during cooking, what could explain the increase of antioxidant activity of cooked ginger (Shobana and Naidu, 2000).

Katiyar et al., 1996 studied the inhibition of tumor promotion in SENCAR mouse skin by ethanol extract of ginger rhizome. The study revealed that the animals pre-treated with ginger showed substantially lower tumour body burdens compared with non-ginger-treated controls. The results provide clear evidence that ginger possesses anti-skin tumour promoting effects. Masuda et al., 2004 reported that both in vitro and animal experiments with ginger have shown this plant possesses antioxidant action and can have a protective effect against free radical damage. Some active compounds of ginger (gingerol and paradol) might exercise a preventive effect by leading apoptosis in cancer or transformed cells. Nigam et al., (2009) suggest that these compounds suppress proliferation of human cancer cells through the induction of apoptosis.
Ginger as anti-migraine

Migraine is considered as a neurological disorder. Ginger is reported in Ayurvedic system of medicine to be useful in neurological disorders. It is proposed that administration of ginger may exert prophylactic effects in migraine headaches without any side effects. Ginger powder (500-600 mg) taken at the onset of migraine aura, followed by 4 hourly intake for 3-4 days, is reported to provide relief from migraine attacks (Mustafa et al., 1990).

Ginger as anti-inflammatory

Some of the characteristic features of rheumatic diseases are polyarthritis with inflammation, swelling, and pain. In Ayurveda, ginger is reported to be useful in treating inflammation and rheumatism. One of the mechanisms by which ginger exerts its ameliorative effects could be related to inhibition of prostaglandin and leukotriene biosynthesis. Srivastava and Mustafa (1989) revealed that an average intake of 5 g of fresh ginger or 0.5 to 1 g powdered ginger reduced pain, swelling, morning stiffness in patients suffering from arthritis. None had side effects due to ginger intake.

Ginger as anti-microbial

Ginger has been traditionally used for the treatment of throat infections and been reported to inhibit the broad range of pathogenic microorganisms included gram positive, gram negative bacteria and fungi. Many in vitro studies proved the antimicrobial potential of Z. officinale extracts towards both gram positive and gram negative bacteria. Antimicrobial activity of the different organic extracts (n-hexane, ethyl acetate, ethanol and water) of Z. officinale rhizome was reported against Colliform bacillus, Staphylococcus epidermidis and Streptococcus viridians. The study showed that all the extracts except the water extract have antibacterial activity and that the inhibition of bacterial growth. Among all, ethanol extract showed maximum antimicrobial activity (Malu et al., 2009). Antifungal activity of the ethanol extract of Z. officinale was reported against two strains of Candida albicans (PTCC 5027 and ATCC 10231).

In vitro studies have shown that active constituents of ginger inhibit multiplication of colon bacteria. These bacteria ferment undigested carbohydrates causing flatulence. This can be counteracted with ginger. It inhibits the growth of Escherichia coli, Proteus sp, Staphylococci, Strepto-cocci and Salmonella (Gugnani and Ezenwanze, 1985). The ginger extract has antimicrobial action at levels equivalent to 2000 mg/ml of the spice. Ginger inhibits Aspergillus, a fungus known for production of aflatoxin, a carcinogen (Kapoor, 1997). Fresh ginger juice showed inhibitory action against A.niger, S.cerevisiae, Mycoderma SPP. and L. acidophilus at 4, 10, 12 and 14% respectively at ambient temperatures (Meena, 1992).

Ginger against diabetes

Ginger is used to control diabetes in traditional medicinal system. Many in vivo scientific studies have been conducted in animal models to evaluate the ant-diabetic activity of different organic extracts and fresh juice of Z. officinale. Hypoglycaemic potential of Z. officinale was reported in streptozotocin induced diabetic rats. Treatment with aqueous extract (500 mg/kg body weight, i.p.) of Z. officinale for a period of 7 weeks significantly decreased the serum glucose, cholesterol and triacylglycerol levels in the treated diabetic rats compared with the control diabetic rats (Al-amin et al., 2006). Fresh juice of Z. Officinalae was reported to carry hyperglycaemic activity. The Fresh juice of Z. officinale (4 ml/kg body weight) produced a significant time dependent decrease in blood glucose level in streptozotocin induced diabetic rats (Asha et al., 2011). The juice of Z. officinale was reported to control type I diabetes. Treatment with Z. officinale juice in streptozotocin induced type I diabetic rats resulted in to a significant increase in insulin levels and a decrease in fasting glucose levels in diabetic rats. Z. officinale treatment also caused a decrease in serum cholesterol, serum triglyceride and blood pressure in diabetic rats (Akhani et al., 2004).

Ginger against other common diseases

Traditionally, ginger is used in Ayurveda, Siddha, Chinese, Arabian, Africans, Caribbean and many other medicinal systems to cure a variety of diseases viz, nausea, vomiting, asthma, cough, cold, flu, hypertension, loss of appetite, constipation, indigestion and pain (Grzanna et al., 2005). For colds and headache 2 table spoon 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,
4. Bandyopadhyay, M., Chakraborty, R.,
3. Asha, B., Krishnamurthy, K.H., Devaru, S.:
to cure common ailments in urban areas.
which can be use easily as the alternative medicine
medicinal plant with several medicinal properties
medicinal potential and represents it as a valuable
Pharmacological screenings of ginger revealed its
diseases and can relieve stresses and hypertension.
migraine and others have side effects of varying
used for treating diseases such as diabetes, cancer,
and fenugreek on blood lipids, blood sugar and
platelet aggregation in patients with coronary
artery disease. Prostaglandins Leukot Essent
Fatty Acids, 1997; 56: 379.
7. Chakravarthy, K.S., Singh, R.B., Swaminathan,
S., Venkatesan, P.: Prevalence of asthma in urban
8. Chakravarty, A., Mukherjee, A.; Roy, D.: Trigger
factors in childhood migraine: a clinic based
study from Eastern India. J. Headache Pain,
10. Chhabra, P., Sharma, G., Kannan, A.T.: 
Prevalence of respiratory disease and associated
factors in an urban area of Delhi. Indian J.
11. Ibrahim, S., Kinra, S., Bowen, L., Andersen,
E., Ben-Shlomo, Y., Lyngdoh, T.: The effect of
rural-to-urban migration on obesity and diabetes
2010; 7: e1000268.
- A herbal medicinal product with broad anti-
125-32.
activity of extracts of ginger (Zingiber officinale)
ginger oleoresin on serum and hepatic cholesterol
levels in cholesterol fed rats. J. Med. Food., 2005; 8:
15: 183.
15. Kapoor, A.: Antifungal activities of fresh juice
and aqueous extracts of turmeric and ginger 
16. Katiyar, S.K., Agarwal, R., Mukhtar, H.: 
Inhibition of tumor promotion in sencar mouse
skin by ethanol extract of Zingiber officinale 
18. Malu, S.P., Obochi, G.O., Tawo, E.N., Nyong,


