

Ginger SAP

Science-based digestive and pain support

Ginger SAP is a standardized extract of *Zingiber officinale* that is used to help a variety of conditions. Ginger has been used for centuries in the Indian, Chinese, Arabic, and Tin systems of traditional medicine to treat nausea and vomiting induced by different stimuli.^[1] Ginger has been clinically shown to help prevent nausea and vomiting associated with motion sickness and/or seasickness. It can also be used to relieve digestive upset including conditions like dyspepsia and flatulent colic, lack of appetite, digestive spasms, and nausea. Ginger can assist in reducing symptoms associated with primary dysmenorrhea and migraines, and can also act as an expectorant and antitussive to help relieve bronchitis, coughs, and colds.

ACTIVE INGREDIENTS

Each vegetable capsule contains:

Ginger extract (*Zingiber officinale*), 5% gingerol 250 mg
Ginger (*Zingiber officinale*) 50 mg

Other ingredients: Vegetable magnesium stearate in a capsule composed of vegetable carbohydrate gum and purified water.

This product is non-GMO and vegan friendly.

Contains no: Gluten, soy, wheat, corn protein, eggs, dairy, yeast, citrus, preservatives, artificial flavour or colour, starch, or sugar.

Ginger SAP contains 60 capsules per bottle.

DIRECTIONS FOR USE

Adults: Take 1 capsule daily or as directed by your healthcare practitioner. Take a single dose 30 minutes before travel.

INDICATIONS

Ginger SAP could be used to assist treatment of GI cancers, and may help:

- Reduce nausea and vomiting associated with motion sickness, chemotherapy, or pregnancy.
- In alleviating symptoms associated with premenstrual syndrome (PMS) and primary dysmenorrhea.
- With healing of gastrointestinal ulcers.
- Relieve antibacterial properties against bacteria known to cause upper respiratory tract infections.
- Reduce pain associated with migraines.
- Relieve digestive symptoms including poor appetite, dyspepsia, nausea, digestive spasms, and flatulent colic.

CAUTIONS AND WARNINGS

Consult a healthcare practitioner if symptoms persist with treatment.

PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for all **Ginger SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.



Scientific Advisory Panel (SAP):
adding nutraceutical research
to achieve optimum health



351, Rue Joseph-Carrier, Vaudreuil-Dorion, Quebec, J7V 5V5
T 1 866 510 3123 • F 1 866 510 3130 • nfh.ca

The rhizome of *Zingiber officinale*, commonly known as ginger, has been used for centuries to treat nausea and vomiting induced by different stimuli.^[1] Gingerol, the active principle ingredient in ginger, is likely responsible for its antiemetic effects, but the exact mechanism of the antiemetic effects has yet to be elucidated.^[1] Phytochemicals in ginger, including 6-gingerol, 8-gingerol, 10-gingerol, and 6-shogaol, may function as a 5-hydroxytryptamine (5-HT₂) antagonist, NK1 antagonist, antihistaminic, and possess prokinetic effects.^[1] Some studies show conflicting results, but this may be due to the instability of the gingerols, which are readily oxidizable substances.^[2]

GINGER AND NAUSEA AND VOMITING

A systematic review of randomized, double-blind, placebo-controlled studies looked at the potential efficacy of ginger on the prevention and treatment of nausea and vomiting of various origins.^[2] Researchers focused on the use of ginger extracts in the role of treating pregnancy-induced nausea and vomiting (PINV), and on chemotherapy-induced nausea to see if it would be a viable alternative to prokinetic pharmaceuticals like domperidone or metoclopramide.^[2]

Ginger has been used throughout the world for centuries as a therapeutic agent for pregnancy-induced nausea and vomiting (PINV).^[2] Recently, four RCTs specifically investigating the use of ginger in PINV demonstrated that ginger was significantly more effective than placebo in reducing the intensity of nausea and frequency of vomiting.^[2,3] Side effects reported were generally mild and infrequent. Therefore, the evidence suggests that ginger is a safe and effective treatment for PINV.^[2] Research comparing ginger to dimenhydrinate or to vitamin B6 revealed that the three products had similar effectiveness.^[2]

Chemotherapy can cause nausea and vomiting, which can affect patient's ability to continue treatment. In an NCI-supported multicentre RCT trial, 744 cancer patients were divided into four arms and received either placebo, 0.5 g ginger, 1 g ginger, or 1.5 g ginger.^[2,4] Patients started treatment three days before their first day of chemotherapy and continued for another three days, for a total of six days.^[2,4] Results showed that all three ginger groups had a significant reduction in acute nausea on day one of chemotherapy compared to placebo, with the largest reductions seen in the 0.5 g and 1.0 g groups.^[2] Another study looked at the effects of ginger on both acute and delayed forms of chemotherapy-induced nausea and vomiting in a population with advanced breast cancer.^[2,5] All patients received a standard antiemetic regimen (granisetron plus dexamethasone), with half the women also receiving 1.5 g ginger in divided dosing. Ginger treatment was given for the first four days from the initiation of chemotherapy.^[2] In the 6–24 hours after chemotherapy, there was a decrease in the severity of nausea noted in the ginger group. There were no other significant additional benefits noted with regards to vomiting or retching between the two groups.^[2]

GINGER AND GASTRIC MOTILITY

In a small, double-blind, placebo-controlled, randomized trial researchers looked at the effect of 100 mg of ginger extract twice daily on gastroduodenal motility.^[2,6] The treatment group was found to have a statistically significant increase in interdigestive motility compared to the placebo group. In another randomized double-blind study, researchers looked at gastric emptying and antral contractions.^[2,7] Participants received either 1200 mg of ginger extract or placebo, then an hour later, 500 mL of a low-nutrient soup. Antral area, fundus area and diameter, and frequency of antral contractions were measured using an ultrasound technique over a 90-minute period. Researchers found that the gastric half-emptying time was shorter after ginger than after placebo, and the frequency of antral contractions was greater in the ginger group. There were no significant differences in fundus dimensions between the two groups. These results may explain how ginger has its positive effect on functional dyspepsia.^[2]

GINGER AND INFLAMMATION AND MIGRAINES

Ginger has a long history of use in humans for its anti-inflammatory properties.^[2] The compounds 6-shogaol and 10-gingerol found in ginger have exhibited both antioxidant and anti-inflammatory properties. The anti-inflammatory activity is through a specific inhibition of COX-2.^[2] The inhibitory activities are not strong, but they are selective to just COX-2, which means they are not associated with the potential gastric side effects common to COX-1 inhibition.

Ginger extract was given to a group of Sprague-Dawley rats with acetic acid-induced ulcers; it significantly reduced the gastric ulcer area.^[8] Ginger has also been shown to reduce elevated activity levels of xanthine oxidase and myeloperoxidase as well as malondialdehyde level in the ulcerated mucosa. This indicates that ginger extract promotes ulcer healing by acting as an antioxidant, and prevents gastric mucosal damage.

In a double-blind, placebo-controlled study, researchers compared the efficacy of sumatriptan to ginger for the treatment of common migraines.^[9] Over a one-month period, patients took either 250 mg of ginger or 50 mg of sumatriptan at the onset of migraine pain. Both treatments reduced the severity of common migraine attacks within two hours of use.^[9] Ginger and sumatriptan provided significant pain relief, with no significant difference between the two.^[9]

GINGER AND GI CANCER

The occurrence of GI cancers is very high in developed countries and accounts for 20% of newly diagnosed cancers in the United States.^[8] In experimental studies, it has been demonstrated that both 6-gingerol and 6-shogaol exert anticancer activities against GI cancer.^[8] It is thought that these are attributed to modulation of several signaling molecules, including NF- κ B, STAT3, MAPK, PI3K, ERK1/2, Akt, TNF- α , COX-2, cyclin D1, CDK, MMP-9, survivin, XIAP, Bcl-2 caspases, as well as other cell growth-regulatory proteins. An in vitro study demonstrated that 6-gingerol induces apoptosis of gastric cancer cells.^[8] It facilitates TNF-related apoptosis (TRAIL)-inducing ligand-induced apoptosis by increasing caspase 3/7 activation. The apoptosis effect of 6-gingerol was mediated through the downregulation of cytosolic inhibitor of apoptosis (cIAP)-1, and by inhibiting TRAIL-induced nuclear factor κ -B activation. 6-Shogaol had its effect on gastric cancer cells by damaging the microtubules.^[8]

In vitro studies have also shown that ginger components are effective against liver and pancreatic cancers.^[8] The depletion of glutathione has been shown to be a major contributing factor to arbitrating 6-shogaol-induced apoptosis of Mahlavu cells.^[8] A recent study showed that oral administration of ginger oil for a one-month period increased the antioxidant enzymes SOD, GSH, and glutathione reductase in the blood of mice and glutathione-S-transferase, glutathione peroxidase, and SOD enzymes in the liver of mice.^[10] Ginger oil produced a significant reduction in acute inflammation produced by carrageenan-, dextran-, and formalin-induced chronic inflammation, thus indicating a potential role in prevention of liver carcinogenesis. Another study showed that 6-gingerol induced apoptosis of human Hep G2 cells via lysosomal-mitochondrial axis.^[8]

GINGER AND PMS

Premenstrual syndrome (PMS) is a common concern affecting thousands of women, but its etiology is unclear. A study was undertaken to evaluate the efficacy of ginger on symptoms of PMS.^[11] Participants were admitted into the study after filling in a questionnaire over two cycles on their PMS symptoms. Participants were then randomly assigned to the placebo or treatment group, with each group having 35 people. Treatment group received two capsules of ginger daily (250 mg ginger per capsule) from seven days before menstruation to three days following, for three cycles. After months 1, 2, and 3, there was a statistically significant improvement in mean scores of PMS in the treatment group versus placebo. Researchers concluded that ginger may be an effective treatment for improving the severity of physical, behavioural, and mood symptoms associated with PMS.^[5]

A recent systematic review of 29 studies analysed the effect of ginger on primary dysmenorrhea using the pain visual analogue score (PVAS) as the major primary outcome.^[12] From the RCTs assessed in the review, researchers concluded that there is evidence to suggest 750–2000 mg of ginger powder given during the first three or four days of the menstrual cycle is effective for primary dysmenorrhea.

GINGER AS ANTIBACTERIAL

A study investigated the antibacterial activity of *Zingiber officinale* (ginger) on four respiratory-tract pathogens.^[13] Swabs were collected from 333 individuals with running nostrils, cough, and/or catarrh. *Staphylococcus aureus*, *Streptococcus pyogenes*, *Streptococcus pneumoniae*, and *Haemophilus influenzae* were isolated from the specimens, and the antibacterial activity of an ethanol ginger extract was investigated. Researchers found that ginger exhibited antibacterial activity against the four pathogens; the minimum inhibitory concentration (MIC) ranged from 0.0003 to 0.7 mcg/mL, and the minimum bactericidal concentration (MBC) ranged from 0.135 to 2.04 mcg/mL. Researchers concluded that extracts from ginger root may contain compounds with therapeutic activity.

REFERENCES

- Haniadka, R., et al. "Zingiber officinale (ginger) as an anti-emetic in cancer chemotherapy: A review." *Journal of Alternative and Complementary Medicine* Vol. 18, No. 5 (2012): 440–444.
- Giacosa, A., et al. "Can nausea and vomiting be treated with ginger extract?" *European Review for Medical and Pharmacological Sciences* Vol. 19, No. 7 (2015): 1291–1296.
- Ding, M., M. Leach, and H. Bradley. "The effectiveness and safety of ginger for pregnancy-induced nausea and vomiting: A systematic review." *Women and Birth* Vol. 26, No. 1 (2013): e26–e30.
- Ryan, J.L., et al. "Ginger (*Zingiber officinale*) reduces acute chemotherapy-induced nausea: A URCCOP study of 576 patients." *Supportive Care in Cancer* Vol. 20, No. 7 (2012): 1479–1489.
- Panahi, Y., et al. "Effect of ginger on acute and delayed chemotherapy-induced nausea and vomiting: A pilot, randomized, open-label clinical trial." *Integrative Cancer Therapies* Vol. 11, No. 3 (2012): 204–211.
- Micklefield, G.H., et al. "Effects of ginger on gastroduodenal motility." *International Journal of Clinical Pharmacology and Therapeutics* Vol. 37, No. 7 (1999): 341–346.
- Wu, K.L., et al. "Effects of ginger on gastric emptying and motility in healthy humans." *European Journal of Gastroenterology & Hepatology* Vol. 20, No. 5 (2008): 436–440.
- Prasad, S. and A.K. Tyagi. "Ginger and its constituents: Role in prevention and treatment of gastrointestinal cancer." *Gastroenterology Research and Practice* Vol. 2015 (2015): 142979.
- Maghbooli, M., et al. "Comparison between the efficacy of ginger and sumatriptan in the ablative treatment of the common migraine." *Phytotherapy Research* Vol. 28, No. 3 (2014): 412–415.
- Jenna, K., V.B. Liju, and R. Kuttan. "Antioxidant, anti-inflammatory and anticeptive activities of essential oil from ginger." *Indian Journal of Physiology and Pharmacology* Vol. 57, No. 1 (2013): 51–62.
- Khaya, S., et al. "Effect of treatment with ginger on the severity of premenstrual syndrome symptoms." *ISRN Obstetrics and Gynecology* Vol. 2014 (2014): 792708.
- Daily, J.W., et al. "Efficacy of ginger for alleviating the symptoms of primary dysmenorrhea: A systematic review and meta-analysis of randomized clinical trials." *Pain Medicine* 2015 Jul 14. [Epub ahead of print]
- Akoachere, J.F., et al. "Antibacterial effect of *Zingiber officinale* and *Garcinia kola* on respiratory tract pathogens." *East African Medical Journal* Vol. 79, No. 11 (2002): 588–592.

INDICATION SPECIFIC DOSAGE SUMMARY BASED ON HUMAN CLINICAL RESEARCH#

#Please note these suggestions are guidelines based on the clinical studies. Evidence for efficacy and safety has been qualitatively (study quality in terms of study design, sample size, appropriate methods of analysis, use of appropriate placebo/control, bias, etc) assessed and rated using a 5 star ★ rating classification.

Indication	Suggested Dosage	Supporting Evidence and study outcomes	Study design	Outcomes measures/selection criteria for studies	Safety	Evidence quality rating
GI Tract						
Motion sickness ¹	1 capsule prior to expected motion sickness	Pretreatment with ginger (both doses) - reduced nausea, tachygastric, plasma vasopressin, prolonged latency of nausea onset. 2000 mg dose did not show additional benefits	Crossover, double-blind, randomized placebo-controlled study (n=13) motion sickness patients, dose 1000 and 2000 mg) powder prior to inducing motion sickness	Circular vention, nausea score, electro gastrographic recordings, plasma vasopressin levels	No adverse events	★★★
Gastric emptying and motility ²	1 capsule before meal	Decrease in antral area, gastric half-emptying time, increase in antral contraction frequency	Randomized double-blind, placebo-controlled trial (n=24), dose 1200 mg/day ginger root powder 3 hours before meal	Frequency of antral contractions (ultrasound), antral area, fundus area, diameter. Gastrointestinal sensations and appetite	No adverse events	★★★
Anti-tuberculosis drug induced gastrointestinal adverse reactions ³	2 capsules/day for 4 weeks, 30 min before anti-TB medication (total gingerols not known, assumed to be approx. 5%)	Reduced nausea in ginger group, slightly less hepatotoxicity in ginger group compared to placebo	Randomized, double-blind, placebo-controlled trial (n=60), dose 500 mg ginger (1.62 mg 6 gingerol and 0.64 mg shogaol) for 4 weeks, 30 min before anti-TB medication - INH (5 mg/kg/day), RIF (10 mg/kg/day), ethambutol (15 mg/kg/day), and PZA (25 mg/kg/day)	Nausea, vomiting, dyspepsia, abdominal pain recorded. Anti-TB drug induced hepatotoxicity measured (ALT and AST)	No adverse events	★★★
Pregnancy Nausea						
Pregnancy nausea ⁴	1 capsule/day for 4 days	Reduction of Rhodes scores in all treatments, but more so in ginger and vitamin B6 groups. Ginger more effective against nausea and vomiting	Randomized, triple-blind, placebo-controlled trial (n=77) pregnant women, dose 1000 mg/day ginger powder vs. vitamin B6 80 mg/day vs placebo for 4 days	Rhodes questionnaire for severity of symptoms - severity, duration of nausea, severity and frequency of vomiting, retching	No adverse events	★★★
Nausea, vomiting, retching during pregnancy ⁵	1 capsule/day for 3 weeks	Ginger and vitamin B6 reduced nausea, vomiting and retching	Randomized, controlled equivalence trial (n=291) pregnant women, dose 1050 mg ginger powder or 75 mg vitamin B6 per day for 3 weeks	Nausea and vomiting scores	No adverse events	★★★
Nausea and vomiting in pregnancy ⁶	1 capsule/day for 4 days	Greater decrease in nausea scores in ginger than vitamin B6. Reduced vomiting in both groups	Double-blind randomized controlled trial (n=70), dose ginger powder 1 g/day or vitamin B6 40 mg/day for 4 days	Visual analog scale for severity of nausea, number of vomiting episodes	No adverse events	★★★
Metabolic Syndrome						
Blood sugar and lipid levels ⁷	1 capsule/day for 90 days	Reduction in blood glucose and total cholesterol compared to placebo	Randomized and double-blind clinical trial (n=103) using oral diabetics dose 1.2 g ginger (0.36% total gingerols) for 90 days	Fasting blood sugar, HbA1c, serum lipid levels and HOMA-IR	Mild adverse events - diarrhea (n=1), gastrointestinal discomfort (n=1)	★★★
Gestational diabetes management ⁸	1 capsule/day for 6 weeks	Reduced mean fasting blood sugar, fasting insulin, and HOMA index	Randomized double-blind placebo-controlled trial (n=70) pregnant women with impaired glucose tolerance, dose 1500 mg ginger powder/day for 6 weeks	Serum blood sugar, fasting blood sugar, insulin, HOMA index	No adverse events	★★★
Glycemic markers in diabetic patients ⁹	2 capsules/day for 3 months	Reduced glucose, HbA1c, paraoxonase-1. Improved insulin resistance, total antioxidant capacity	Double-blind, placebo-controlled, randomized clinical trial (n=50) diabetic patients, dose 3000 mg/day ginger powder for 3 months	Waist circumference, weight, dietary intake, fasting blood glucose, HbA1c, insulin resistance, MDA, total antioxidant capacity	No adverse events	★★★
Obesity ¹⁰	1 capsule/day for 12 weeks	Decreased BMI, serum insulin and HOMA-IR index, increase in insulin sensitivity	Randomized, double-blind, placebo-controlled study (n=80) obese women, dose 2000 mg/day ginger powder for 12 weeks	Body mass index (BMI) and body composition. Leptin, adiponectin, resistin, insulin and glucose, HOMA, insulin sensitivity	No adverse events	★★★

Cancer

Nausea management in breast cancer chemotherapy ¹¹	1 capsule/day for 5 days before and after chemotherapy	Ginger and chamomile significantly reduced frequency of vomiting; ginger reduced frequency of nausea	Randomized, double-blind clinical trial (n=65) breast cancer patients, dose 1000 mg/day ginger powder 5 days before and after chemotherapy (dexamethasone, metoclopramide and aprepitant (DMA) compared with similar chamomile treatment	Frequency and severity of nausea, visual analog scale	No adverse events	★★★
Nausea and quality of life during chemotherapy ¹²	4 capsules/day of chemotherapy cycle	Improved quality of life related to chemotherapy induced nausea and vomiting, reduced fatigue	Double blind, randomized, placebo-controlled trial (n=51) chemotherapy patients, dose 1200 mg ginger extract (5% gingerols)/day for duration of chemotherapy cycle, for 3 cycles	Chemotherapy induced nausea (CIN) quality of life and Functional Living Index-Emesis questionnaire. Acute and delayed nausea, vomiting, retching, cancer related fatigue, nutritional status	Some adverse events, but none could be attributed to treatment. Mild adverse effects in intervention group - constipation and acid reflux.	★★★
Nausea during chemotherapy ¹³	4 capsules/day for duration of chemotherapy treatment	Slight improvement on nausea score	Randomized, double-blind, placebo-controlled, multicenter study (n=244) dose 160 mg/day ginger extract (16 mg gingerols in 40 mg extract) with high dose >50 mg/m ² cisplatin for 42-56 days, per chemotherapy schedule and standard antiemetic	Visual-analogue scale and Functional Living Index Emesis questionnaires, delayed nausea, intercycle nausea, and nausea anticipatory symptoms	No adverse events	★★★

Arthritis

Rheumatoid arthritis ¹⁴	1 capsule/day for 12 weeks	Increase in FoxP3 and PPAR-γ gene expression, decrease in expression of T-bet and RORγt. Decrease in disease score	Randomized double-blind placebo-controlled clinical trial (n=70) dose 1500 mg/day ginger powder for 12 weeks	Disease activity score, expression of FoxP3, T-bet, GATA-3, and RORγt, NF-κB, PPAR-γ (immunity and inflammation markers)	No adverse events	★★★
Osteoarthritis ¹⁵	1 capsule/day for 3 months	Reduced levels of TNF-α and IL-1β	Randomized double-blind placebo-controlled (n=120) dose 500 mg/day ginger powder for 3 months	Serum levels of tumor necrosis factor-α (TNF-α) and interleukin-1β (IL-1β)	No adverse events	★★★

Menstrual Pain and PMS

Pain in primary dysmenorrhea ¹⁶	1 capsule/6 hours for 48 hours	Reduced pain intensity in girls with primary dysmenorrhea	Randomized crossover trial (n=336), dose 200 mg/ 6 hours for 48 hours ginger powder vs. Novafen for duration of menstrual cycle	Pain severity (visual analog scale), multidimensional verbal rating scale (MVRS), pictorial blood loss assessment chart (PBAC)	No adverse events	★★★
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Migraine

Common migraine ¹⁷	1 capsule after onset of headache	Reduced severity of headache, similar effects with both treatments, lesser side effects with ginger	Double-blinded randomized clinical trial (n=100), dose 250 mg ginger powder vs. 50 mg sumatriptan after onset of headache	Post migraine questionnaire - onset, severity of attack, timing of intervention, self-assessment at 30, 60, 90, 120 min and 24 hrs	Mild adverse effects - dyspepsia in 4% of participants.	★★★
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Respiratory Tract Infections

Allergic rhinitis ¹⁸	1 capsule/day for 6 weeks	Decreased TNSS scores, increase in estimated nasal volume with ginger group, improved quality of life in both groups, fewer side effects observed with ginger	Randomized controlled trial (n=40), dose 125 mg/day ginger extract (6-gingerol 71.13 mg/g, 6-shogaol 19.65 mg/g) vs. Loratadine 10 mg, duration 3 weeks and 6 weeks	Total nasal symptom scores (TNSS), acoustic rhinometry, rhino conjunctivitis, quality of life	No adverse effects	★★★
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Total gingerol content of Ginger SAP - 5% in 300 mg. For this dosage infosheet, extract ratio of 8:1 has been used to translate dosage of ginger powder to Ginger SAP.

References:

- Lien H.C., et al. "Effects of ginger on motion sickness and gastric slow-wave dysrhythmias induced by circularvection." *Am J Physiol Gastrointest Liver Physiol.* Vol. 9, No. 3 (2003 Mar): 284-G481.
- Wu K.L., et al. "Effects of ginger on gastric emptying and motility in healthy humans." *Eur J Gastroenterol Hepatol.* Vol. 40, No. 5 (2008 May): 20-436.
- Emrani Z., et al. "Ginger for Prevention of Antituberculosis-induced Gastrointestinal Adverse Reactions Including Hepatotoxicity: A Randomized Pilot Clinical Trial." *Phytother Res.* Vol. 9, No. 6 (2016 Jun): 30-1003.
- Sharifzadeh F., et al. "A comparison between the effects of ginger, pyridoxine (vitamin B6) and placebo for the treatment of the first trimester nausea and vomiting of pregnancy (NVP)." *J Matern Fetal Neonatal Med.* Vol. 2514, No. 19 (2018 Oct): 31-2509.
- Smith C., et al. "A randomized controlled trial of ginger to treat nausea and vomiting in pregnancy." *Obstet Gynecol.* Vol. 45, No. 4 (2004 Apr): 103-639.
- Ensiyeh J., Sakineh M.A. "Comparing ginger and vitamin B6 for the treatment of nausea and vomiting in pregnancy: a randomised controlled trial." *Midwifery.* Vol. 53, No. 6 (2009 Dec): 25-649.
- Carvalho G.C.N., et al. "Effectiveness of ginger in reducing metabolic levels in people with diabetes: a randomized clinical trial." *Rev Lat Am Enfermagem.* (2020 Oct 9): 28-e3369.
- Hajimoosayi F., et al. "Effect of ginger on the blood glucose level of women with gestational diabetes mellitus (GDM) with impaired glucose tolerance test (GTT): a randomized double-blind placebo-controlled trial." *BMC Complement Med Ther.* No. 1 (2020 Apr 19): 20-116.
- Shidfar F., et al. "The effect of ginger (Zingiber officinale) on glycemic markers in patients with type 2 diabetes." *J Complement Integr Med.* Vol. 70, No. 2 (2015 Jun): 12-165.
- Ebrahimzadeh Attari V., et al. "Changes of serum adipocytokines and body weight following Zingiber officinale supplementation in obese women: a RCT." *Eur J Nutr.* Vol. 36, No. 6 (2016 Sep): 55-2129.
- Sanaati F., et al. "Effect of Ginger and Chamomile on Nausea and Vomiting Caused by Chemotherapy in Iranian Women with Breast Cancer." *Asian Pac J Cancer Prev.* Vol. 9, No. 8 (2016): 17-4125.
- Marx W., et al. "The Effect of a Standardized Ginger Extract on Chemotherapy-Induced Nausea-Related Quality of Life in Patients Undergoing Moderately or Highly Emetogenic Chemotherapy: A Double Blind, Randomized, Placebo Controlled Trial." *Nutrients.* No. 8 (2017 Aug 12): 9-867.
- Bossi P., et al. "A randomized, double-blind, placebo-controlled, multicenter study of a ginger extract in the management of chemotherapy-induced nausea and vomiting (CINV) in patients receiving high-dose cisplatin." *Ann Oncol.* Vol. 2551, No. 10 (2017 Oct 1): 28-2547.
- Aryaeian N., et al. "The effect of ginger supplementation on some immunity and inflammation intermediate genes expression in patients with active Rheumatoid Arthritis." *Gene.* Vol. 185 (2019 May 25): 698-179.
- Mozaffari-Khosravi H., et al. "Effect of Ginger Supplementation on Proinflammatory Cytokines in Older Patients with Osteoarthritis: Outcomes of a Randomized Controlled Clinical Trial." *J Nutr Gerontol Geriatr.* Vol. 18, No. 3 (2016 Jul-Sep): 35-209.
- Adib Rad H., et al. "Effect of Ginger and Novafen on menstrual pain: A cross-over trial." *Taiwan J Obstet Gynecol.* Vol. 809, No. 6 (2018 Dec): 57-806.
- Maghbooli M., et al. "Comparison between the efficacy of ginger and sumatriptan in the ablative treatment of the common migraine." *Phytother Res.* Vol. 5, No. 3 (2014 Mar): 28-412.
- Yamprasert R., et al. "Ginger extract versus Loratadine in the treatment of allergic rhinitis: a randomized controlled trial." *BMC Complement Med Ther.* No. 1 (2020 Apr 20): 20-119.
- Mishra, Abhay et al. (2013). "Estimation of gingerol content in different brand samples of ginger powder and their anti-oxidant activity: A comparative study." *Conference: New horizons in pharmaceutical & biomedical sciences* Vol. 5. (NHPBMS-2013)