



## GINGER

### Also Known As:

African Ginger, Ardraka, Black Ginger, Cochin Ginger, Gan Jiang, Gingembre, Ginger Essential Oil, Imber, Indian Ginger, Jamaica Ginger, Jiang, Kankyo, Kanshokyo, Nagara, Race Ginger, Rhizoma Zingiberi, Rhizoma Zingiberis, Rhizoma Zingiberis Recens, Shen Jiang, Sheng Jiang, Shoga, Shokyo, Shunthi, Srungavera, Sunth, Sunthi, Vishvabheshaja, Zingiberis rhizoma, Zingiberis siccatum rhizoma, Zinzeberis, Zinziber Officinale, Zinziber Officinalis.

CAUTION: See separate listings for *Alpinia* (Chinese Ginger), *Asarabacca* (Wild Ginger), Common Stonecrop (Wall Ginger), or Wormwood (Green Ginger).

### Scientific Name:

*Zingiber officinale*, synonym *Amomum zingiber*.  
Family: Zingiberaceae.

### People Use This For:

Orally, ginger is used for motion sickness, morning sickness, colic, dyspepsia, flatulence, chemotherapy-induced nausea, rheumatoid arthritis (RA), osteoarthritis, loss of appetite, post-surgical nausea and vomiting, migraine headache, and for discontinuing selective serotonin reuptake inhibitor (SSRI) drug therapy. It is also used orally for anorexia, upper respiratory tract infections, cough, bronchitis, as a galactagogue, diaphoretic, diuretic, as a stimulant; and for treating stomachache, diarrhea, nausea, cholera, and bleeding. Fresh ginger is used orally for treating acute bacterial dysentery, baldness, malaria, orchitis, poisonous snake bites, rheumatism, and toothaches. Dried ginger is used for chest pain, low back pain, and stomach pain. Topically, the fresh juice of ginger is used for treating thermal burns. The essential oil of ginger is used topically as an analgesic.

In foods and beverages, ginger is used as a flavoring agent.

In manufacturing, ginger is used as a fragrance component in soaps and cosmetics.

The oleoresin of ginger is also used as an ingredient in digestive, laxative, antitussive, antifatulent, and antacid preparations.

### Safety:

**LIKELY SAFE** ...when used orally and appropriately. Ginger has been safely used in several clinical trials (721, 722, 723, 5343, 7048, 7084, 7085, 7400, 7623) (11346, 12472, 13080, 13237, 13244).

**PREGNANCY: POSSIBLY SAFE** ...when used orally for medicinal purposes. Using ginger during pregnancy is controversial (1921, 7083). There is some concern due to preliminary evidence that ginger might affect fetal sex hormones (7083), and an anecdotal report of spontaneous abortion during week 12 of pregnancy in a patient who used ginger for morning sickness (721). However, studies in pregnant women suggest that ginger can be used safely for morning sickness without harm to the fetus.

The risk for major malformations in infants of women taking ginger does not appear to be higher than the baseline rate of 1% to 3% (721, 1922, 5343, 11346, 13071, 13080). As with any medication given during pregnancy, the potential benefit to risk must be weighed. **LACTATION:** Insufficient reliable information available; avoid using amounts greater than those found in foods.

## Effectiveness:

### POSSIBLY EFFECTIVE

**Morning sickness.** Taking ginger orally seems to reduce the severity of nausea and vomiting in some pregnant patients with morning sickness. Ginger seems to be more effective than placebo and comparable to vitamin B6 (721, 1922, 5343, 11346, 13071). The decision to use ginger (or any drug) during pregnancy should be based on possible benefit compared to potential risk.

**Postoperative nausea and vomiting.** Taking ginger 1 gram one hour prior to surgery seems to reduce the incidence of 24-hour postoperative nausea and vomiting (PONV) (722, 723, 1919, 13237). One analysis suggests that ginger can reduce PONV by up to 38% (13237). Some evidence also suggests that ginger might be comparable to metoclopramide (Reglan) for reducing PONV (722, 1919). But ginger does not seem to reduce the incidence of 3-hour PONV (3452). Ginger also might not be beneficial for reducing incidence of PONV in patients who have a history of a low rate of PONV (3453).

**Vertigo.** Taking 1 gram of ginger orally seems to reduce symptoms of vertigo, including nausea; however, it does not seem to reduce nystagmus (7623).

### POSSIBLY INEFFECTIVE

**Motion sickness.** Taking ginger orally, 500-1000 mg, up to 4 hours prior to travel does not seem to prevent motion sickness (7624, 7625). Some patients report subjective feelings of improvement, but objective measures are not significantly affected by ginger (7400).

### INSUFFICIENT RELIABLE EVIDENCE to RATE

**Chemotherapy-induced nausea and vomiting.** There is contradictory evidence about the effectiveness of ginger for chemotherapy-induced nausea and vomiting. Some evidence suggests that taking ginger orally might help reduce chemotherapy-induced nausea when given following administration of intravenous (IV) prochlorperazine (Compazine) (1919). Other evidence suggests that giving ginger 1 gram/day for 5 days starting on the first day of cisplatin chemotherapy in combination with standard therapy is no more effective than standard therapy alone (13244).

**Migraine headache.** Anecdotal evidence suggests that ginger might reduce the severity and duration of migraine headache (7623).

**Osteoarthritis.** There is preliminary evidence that ginger might have modest benefits in osteoarthritis. One study shows that taking a specific ginger extract (Eurovita Extract 33; EV ext-33) orally 170 mg three times daily for 3 weeks is significantly less effective than ibuprofen 400 mg three times daily for reducing pain. Compared to placebo the ginger extract provided very modest to no significant reduction in pain

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(7048); however, since ginger is thought to take several weeks for significant benefit, this trial might not have lasted long enough.

Another study using a different extract (Eurovita Extract 77; EV ext-77), which combines a ginger (*Zingiber officinale*) extract with an alpinia (*Alpinia galanga*) extract, 255 mg twice daily for 6 weeks shows that this extract significantly reduces pain upon standing, pain after walking, and stiffness compared to placebo. However, it does not significantly improve functionality or quality of life (7084).

Another study using another ginger extract (Zintona EC) 250 mg four times daily for knee osteoarthritis shows that ginger significantly reduces pain after 3 months of treatment compared to placebo (12472). Ginger did not significantly reduce pain during the first 3 months of treatment, suggesting that several weeks of treatment might be necessary to for significant pain relief.

**Rheumatoid arthritis (RA).** There is some preliminary evidence that ginger might be helpful for decreasing joint pain in patients with RA (7401).

More evidence is needed to rate ginger for these uses.

**Mechanism of Action:**

The applicable parts of ginger are the rhizome and root. Ginger contains active constituents known as gingerol, gingerdione, and shogaol. The chemical constituents of ginger vary among fresh, semi-dry, and dry forms of ginger (12632). These constituents seem to have a variety of pharmacological properties including antipyretic, analgesic, antitussive, anti-inflammatory, sedative, antibiotic, weak antifungal, and other properties (7628, 12632). However, all of these pharmacological effects may not occur when whole ginger preparations are used.

The mechanism by which ginger reduces nausea and vomiting might be due to the 6-gingerol constituent (1924). It was once thought that ginger might work by increasing gastrointestinal (GI) motility (1923), but more recent evidence shows that ginger does not influence GI emptying time (7621, 7624). Other ginger constituents such as 6-shogaol and galanolactone seem to act on serotonin receptors (1924). Galanolactone seems to act primarily on 5-HT<sub>3</sub> receptors in the ileum, which are the same receptors affected by some prescription antiemetics such as ondansetron (Zofran). The predominant antiemetic action of ginger is localized in the GI tract, but there is some evidence that ginger constituents may also have central nervous system (CNS) activity (1924).

Ginger is sometimes used for inflammatory conditions such as rheumatoid arthritis (RA). Some researchers speculate that certain constituents of ginger might inhibit cyclooxygenase (COX) and lipoxygenase pathways (7401). It may also inhibit tumor necrosis factor (TNF)-alpha (12473). It also seems to inhibit the synthesis of prostaglandin-E<sub>2</sub> (PGE<sub>2</sub>) and thromboxane B<sub>2</sub> (TXB<sub>2</sub>), which mediate inflammation (12634).

There is preliminary evidence that ginger may also have hypoglycemic, hypocholesterolemic, anthelmintic, gastroprotective, and antiplatelet effects (7628, 12633, 12636). In laboratory models of diabetes, ginger seems to increase the release of insulin and lower cholesterol levels (12636). The antiplatelet effect of ginger is exerted by its ability to inhibit platelet thromboxane (7622, 12634).

Fresh ginger extract seems to have blood pressure-lowering effects, according to preliminary research. It seems to have calcium-channel blocking activity. It also has negative inotropic and chronotropic effects (12633).

There is very preliminary evidence that some extracts and constituents of ginger might have mutagenic properties. However, these constituents may only be mutagenic when in the presence of other mutagens. Other ginger constituents such as zingerone have

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the opposite effect and are antimutagenic. Whole ginger preparations may not have mutagenic effects (11299). Animal research hasn't shown any evidence of teratogenicity (11297, 11298). However, one study did find evidence of embryo mortality (11298). Ginger inhibits thromboxane synthetase. This could affect testosterone receptor binding in the fetus and theoretically affect sex steroid differentiation of the fetal brain (7083). However, this has not been seen in animals or humans.

**Adverse Reactions:**

Orally, ginger is usually well tolerated when used in typical doses. However, higher doses of 5 grams per day increase the risk of side effects and decrease tolerability (7622). Common side effects of ginger include abdominal discomfort, heartburn, diarrhea, and a pepper-like irritant effect in the mouth and throat (5343, 7400). Topically, ginger can cause dermatitis in sensitive individuals (12635).

**Interactions with Herbs & Supplements:**

**HERBS WITH ANTICOAGULANT/ANTIPLATELET POTENTIAL:**

Concomitant use of herbs that have constituents that might affect platelet aggregation could theoretically increase the risk of bleeding in some people (7622, 12634). These herbs include angelica, clove, danshen, garlic, ginkgo, Panax ginseng, red clover, turmeric, and others.

**Interactions with Drugs:**

**ANTICOAGULANT/ANTIPLATELET DRUGS**

Interaction Rating = **Moderate** Be cautious with this combination  
 Severity = High " Occurrence = Possible " Level of Evidence = B

Theoretically, excessive amounts of ginger might increase the risk of bleeding. Ginger is thought to inhibit thromboxane synthetase and decrease in platelet aggregation (7622, 12634). Some anticoagulant or antiplatelet drugs include aspirin, clopidogrel (Plavix), dalteparin (Fragmin), enoxaparin (Lovenox), heparin, ticlopidine (Ticlid), warfarin (Coumadin), and others.

**ANTIDIABETES DRUGS**

Interaction Rating = **Minor** Be watchful with this combination  
 Severity = Moderate " Occurrence = Unlikely " Level of Evidence = D

Preliminary research suggests ginger might increase insulin levels. Theoretically, it could have an additive effect with antidiabetes drugs and cause hypoglycemia (12636). Some antidiabetes drugs include glimepiride (Amaryl), glyburide (DiaBeta, Glynase PresTab, Micronase), insulin, metformin (Glucophage), pioglitazone (Actos), rosiglitazone (Avandia), and others.

**CALCIUM CHANNEL BLOCKERS**

Interaction Rating = **Minor** Be watchful with this combination  
 Severity = Moderate " Occurrence = Unlikely " Level of Evidence = D

Theoretically, ginger might have an additive effect with calcium channel blockers. Preliminary research suggests it might have hypotensive and calcium channel-blocking effects (12633). Calcium channel blockers include nifedipine (Adalat, Procardia), verapamil (Calan, Isoptin, Verelan), diltiazem (Cardizem), isradipine (DynaCirc), felodipine (Plendil), amlodipine (Norvasc), and others.

**PHENPROCOUMON**

Interaction Rating = **Moderate** Be cautious with this combination  
 Severity = High " Occurrence = Possible " Level of Evidence = D

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Phenprocoumon, a warfarin-related anticoagulant used in Europe, might increase the international normalized ratio (INR) when taken with ginger. There is one case report of a 76 year old woman with a stable INR on phenprocoumon that increased to greater than 10 when she began consuming dried ginger and ginger tea (12880).

**WARFARIN (Coumadin)**

Interaction Rating = **Moderate** Be cautious with this combination

Severity = High " Occurrence = Possible " Level of Evidence = B

Preliminary evidence suggests that ginger might inhibit thromboxane synthetase and decrease platelet aggregation (7622, 12634). There is one case report that ginger increases the INR when taken with phenprocoumon, which has similar pharmacological effects as warfarin (12880). However, research in healthy people suggests that ginger has no effect on INR, or the pharmacokinetics or pharmacodynamics of warfarin (12881, 15176). Until more is known, monitor INRs closely in patients taking significant amounts of ginger.

**Interactions with Foods:**

None known.

**Interactions with Lab Tests:**

None known.

**Interactions with Diseases or Conditions:**

**BLEEDING CONDITIONS:** Theoretically, excessive doses of ginger can interfere with these conditions and increase risk of bleeding (7622, 12634).

**DIABETES:** Theoretically, excessive doses of ginger can cause hypoglycemia, necessitating a change in dose of diabetes medication (12636).

**HEART CONDITIONS:** Theoretically, excessive doses of ginger might worsen some heart conditions. Preliminary research suggests it has negative inotropic and chronotropic activity (12633).

**Dosage/Administration:**

**ORAL:** For morning sickness, 250 mg ginger 4 times daily has been used (721, 5343, 13080).

For motion sickness, 1 gram of dried powdered ginger root 30 minutes to 4 hours before travel has been used (1919, 7400).

For osteoarthritis, several different ginger extract products have been used. One ginger extract (Eurovita Extract 33; EV ext-33) 170 mg three times daily has been used (7048). Another extract (Eurovita Extract 77; EV ext-77), which combines a ginger (*Zingiber officinale*) extract with an alpinia (*Alpinia galanga*) extract, 255 mg twice daily has also been used (7084). Another ginger extract (Zintona EC) 250 mg four times daily has also been used (12472).

For nausea and disequilibrium resulting from selective serotonin reuptake inhibitor (SSRI) discontinuation or tapering, 550-1100 mg ginger 3 times daily has been used (3451).

For postoperative nausea and vomiting, 1-2 grams powdered ginger root one hour before induction of anesthesia has been used (722, 723, 1919, 3453, 13237).

For migraine headache, ginger 500 mg at the onset and repeated every 4 hours up to 1.5-2 grams per day for 3-4 days has been used (7623).

For chemotherapy-induced nausea and vomiting, powdered ginger root 1 gram daily starting on the first day of chemotherapy and continued for 5 days has been used

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(13244). A ginger tea has also been used and is typically prepared and taken on the day of chemotherapy and continued for as long as needed (1920).

**Editor's Comments:**

Ginger is commonly found in the warmer climates, including India, Jamaica, and China. Its flowers are similar to orchids. The rhizome is used as the source for the dried, powder spice.

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