**Poster Session 11**

**Submission ID: 1471**

# ZINGIBER OFFICINALIS: PHARMACOLOGICAL PROPERTIES AND DRUG INTERACTIONS

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## ABSTRACT

Ginger has been widely using as a cooking spice and medicinal plant from ancient times in India and in China. Today ginger is part of the folk medicine as well as in modern medicine. It is used for the treatment of nausea and vomiting in pregnancy and for prevention of travel and sea sickness. Many countries have approved ginger as a nonprescription drug for the prevention of motion sickness. It is also recognized with its anti-inflammatory effect in treatment of rheumatoid arthritis and osteoarthritis, being on par with many steroidal preparations. The essential oil of Rhizoma Zingiberis (Ginger) include α-zingiberene, ar-curcumene, α-bisabolene, neral, geranial, (E)-α-farnesene and zingiberol. Pungent compound (gingerols and shogaols), diarylheptanoids (gingerenones A and B), vitamins and %50 starch are also present. Fresh ginger root contains gingerols, shogaols, 6-dehydrogingerdione, and galanolactone as the major constituents. 6-gingerol is the main pungent component of dried ginger. 6-gingerol can convert to 6-shogaols due to dehydration of 6-gingerols. Fresh ginger is used as antiemetic, antitussive, expectorant, and for inducing perspiration and dispel cold, whereas dried ginger is used for stomachache, vomiting, and diarrhoea accompanied by cold extremities and low pulse, resolve phlegm retention, for cough and dyspnea with copious frothy expectoration and for abnormal uterine bleeding. In vitro studies have shown that fresh ginger extract inhibits both cyclooxygenase and lipoxygenase. Inhibition of arachidonic acid metabolism results with platelet aggregation and inhibition of prostaglandin and leukotriene production. 6-gingerol, 10-dehydrogingerdione and 10-gingerdione are the main ingredients responsible from these effects. According in vitro studies, these components inhibit prostaglandin synthesis more potently than indomethacin. The chemical structures of gingerols shows partial similarities with prostaglandins. Gingerols have been found to be potent inhibitors of prostaglandin biosynthesis. 6-gingerol reduces nausea and vomiting by increasing motility. Galanolacton, similar with ondansetron, has an anti-emetic effect via serotonin (5HT-3) receptors located in ileum. Antiserotonergic activity of ginger including 6-, 8- ve 10-gingerols has also been shown by in vitro studies. Dried ginger is shown to be useful in rheumatoid arthritis. More than 75% of arthritis patients who consumed ginger rhizome powder experienced analgesic effects and reduction in joint swelling. Gingerols have been reported to be hypoglycemic in diabetic rats. Ginger can interact with antacids, H2 antagonists and proton pump inhibitors by its potential in increasing stomach pH. The high dosage of ginger may cause central nervous system (CNS) depression and theoretically increases the effect of barbiturates, benzodiazepines and CNS depressants. Ginger may have a dose-dependent inotropic activity and theoretically may interact with positive inotropic agents and beta-blockers. In diabetic rats serum glucose levels are significantly lowered due to the hypoglycemic effect of ginger, which may

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