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Chamomile

Chamomile originated from Europe and western Asia, and is also found in Australia and North America.

From: Fighting Multidrug Resistance with Herbal Extracts, Essential Oils and Their Components, 2013

Related terms:

Retinol, Protease, Matricaria chamomilla, Carbohydrates, Peptidases, Essential Oils, Niacin, Apigenin

Materia Medica

In Veterinary Herbal Medicine, 2007

Mouth and throat lesions

Chamomile preparations have been found to be beneficial in the treatment of radiation mucositis following head and neck radiation and systemic chemotherapy (Carl, 1991). However, additional studies found conflicting results. A chamomile mouthwash was investigated for its putative ability to relieve stomatitis in people secondary to 5-flourouracil treatment. No difference was noted between people treated with chamomile and those treated with placebo mouthwash (Fidler, 1996). Two separate studies examined the effects of a chamomile spray or a gel used as a lubricant for endotracheal tubes. The authors hypothesized that chamomile could prevent postoperative sore throat and hoarseness. In both trials, no difference was observed between chamomile and placebo lubricants (Charulauxananan, 2004; Kyokong, 2002).

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Alternative Therapeutics for Sleep Disorders

Adrienne Juarascio, ... Nalaka S. Gooneratne, in Therapy in Sleep Medicine, 2012

Side Effect and Safety Profile

Chamomile is part of the Compositae family; thus, patients hypersensitive to the Asteraceae/Compositae family, which includes ragweed, chrysanthemums, marigolds, daisies, and other herbs, should be alert for allergy symptoms.[97] When ingested in the form of a highly concentrated tea, it has also been shown to induce vomiting. It is also possible that chamomile might interact with anticoagulant and antiplatelet drugs as well as any drug with sedative properties such as

benzodiazepine. Chamomile may inhibit cytochrome P-450.[97] Therefore, patients who are taking other drugs metabolized by the enzyme system should used caution when ingesting chamomile products.

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Anxiety Disorders

George M. Kapalka, in Nutritional and Herbal Therapies for Children and Adolescents, 2010

Chamomile

Chamomile, (*Matricaria recutita*) sometimes also referred to as German chamomile, is an herb that is native to Europe, Africa, and Asia, and is now also grown in North America. Chamomile has been used medicinally for thousands of years and was known by ancient Greek, Roman, and Egyptian cultures. It is now approved by Germany's Commission E to treat cough and bronchitis, fevers, cold, inflammation, infection, wounds, and burns. It is available as a supplement in capsules, as well as tea bags and liquid extract.

Chamomile contains terpenoids, flavonoids, and lactones, including matricin and apigenin. Chamomile may have sedative effects because apigenin binds to benzodiazepine receptors and potentiates the activity at GABA A receptors (Viola *et al.*, 1995). Apigenin also stimulates uptake of tyrosine, resulting in increased monoamine production (Morita *et al.*, 1990). Apigenin may also inhibit the MAO enzyme, further increasing the availability of monoamines (Spinella, 2001). Increase in serotonin may especially be related to its anxiolytic effects.

Animal models confirm that chamomile has anxiolytic effects, and a small number of case studies in humans also supports its sedative properties (Medical Economics, 2007), although its use as a hypnotic has been discredited (as discussed in Chapter 9). Because few risks are associated with its use, and the herb is usually well tolerated, a cautious trial in children and adolescents may be warranted.

Very little is known about the pharmacokinetics of chamomile. Doses in adults vary widely and range from 25 mg to 2000 mg per day. Half-life may be short because it is often recommended to take chamomile three times per day. Usually, chamomile is ingested when brewed as a tea and tablets are more difficult to locate, but may offer better dosage control. Liquid extract is generally dosed at 1–4 ml three times per day (TID), and tincture is dosed at 15 ml three to four times per day (TID or QUID). Children and adolescents should start at low doses TID and gradually titrate upwards while response and adverse effects are carefully monitored.

Chamomile is usually well tolerated and side effects are rare. Patients with allergies to plants in the daisy family (including ragweed) should avoid chamomile because an allergic reaction may be triggered. When initiated, treatment with chamomile exerts sedative effects, so monitoring of response is necessary. Chamomile may contribute to blood thinning, so those who take anticoagulant medications should avoid using chamomile. This may include over-the-counter medications, such as aspirin and ibuprofen.

Use of chamomile is contraindicated during pregnancy because it may stimulate uterine contractions. Female adolescents who take chamomile and are suspected of being sexually active must be advised of this risk, and should use contraception to prevent pregnancy.

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Volume 2

P.N. Ravindran, ... G.S. Pillai, in Handbook of Herbs and Spices (Second Edition), Volume 2, 2012

27.3 Chamomile

Chamomile (or camomile) is the common name used for several aromatic plants from the aster family (Asteraceae). There are two major types, the German chamomile and the Roman chamomile. German, or blue chamomile is *Matricaria recutita* (syn. *M. chamomilla*), commonly used in tea. Roman chamomile, or 'lawn' chamomile, is *Anthemis nobilis* (syn. *Chamaemelum nobile*). Other species that are also used as chamomile include:

- *Anthemis arvensis*, corn or scentless chamomile;
- *Anthemis cotula*, stinking chamomile or dog fennel;
- *Anthemis tinctoria*, yellow chamomile or golden marguerite;
- *Ormenis multicaulis*, Moroccan chamomile;
- Eriocephalus punctulatus, *Cape chamomile;*
- *Matricaria discoidea*, wild chamomile or pineapple weed.

Roman chamomile is a small perennial herb with a hairy stem, feathery pinnate leaves, and daisy-like white flowers (larger than those of German chamomile); it grows to about 25 cm high. German chamomile, on the other hand, grows to about 60 cm high and has a hairless branching stem bearing delicate feathery leaves and simple daisy-like white flowers on single stems; it is German chamomile that is the more commonly used plant.

These plants are best known for their ability to be made into a tea that is used to help with sleep and is often served with either honey or lemon. Chrysin, a specific flavonoid found in chamomile, has been shown to have anti-anxiety effects in rodents and is believed to be at least partially responsible for chamomile's reputation as a sleep aid. For a comprehensive treatment of chamomile, readers may refer to Franke and Schilcher (2005). A detailed review can also be found in Ross (2001), in which both traditional and modern uses in various countries are summarized.

27.3.1 German chamomile

Parts of this section are reproduced with permission from an article that first appeared in *Alternative Medicine Review* in 2008 (Thorne Research Inc., 2008).

Chamomile is a widely recognized herb in Western culture… A common ingredient in herbal teas because of its calming, carminative, and spasmolytic properties, it is also a popular ingredient in topical health and beauty products for its soothing and anti-inflammatory effects on skin. Chamomile has a sweet, grassy, and lightly fruity aroma.

… German chamomile flowers contain 0.24- to 2.0-percent volatile oil that is blue in color.

Over 120 constituents have been identified in chamomile flowers (Pino *et al.*, 2000). The complete chemical constitution is listed in Ross (2001); the most important compounds are discussed below (from Thorne Research Inc., 2008):

The two key constituents, (–)-alpha-bisabolol and chamazulene, account for 50–65 percent of total volatile oil content. Other components of the oil include (–)-alpha-bisabolol oxide A and B, (–)-alpha-bisabolone oxide A, spiroethers… sesquiterpenes, cadinene, farnesene, furfural, spathulenol, and proazulene (matricarin and matricin). Chamazulene is formed from matricin during steam distillation of the oil. Yield varies depending on the origin and age of the flowers. According to European Pharmacopoeia (1996) chamomile contain no less than 4 ml essential oil /kg.

Chamomile also contains up to 8 % flavone glycosides (apigenin 7-glycoside and its 6′-acetylated derivative) and flavonols (luteolin glucosides, quercetin glycosides and isohamnetin); up to 10 % mucilage polysaccharides; up to 0.3 % choline; and approximately 0.1 % coumarins (umbelliferone and its methyl ether, herniarin). The tannin level in chamomile is less than one percent.

27.3.2 Medicinal uses of German chamomile

Chamomile is used in the traditional medicine in Europe and America, usually as a hot infusion. Khare (2007) reports that chamomile has sedative, anticonvulsing, carminative, antispasmodic, analgesic, anti-inflammatory and antiseptic properties. Key application areas are in the treatment of inflammatory diseases of the gastrointestinal tract and gastrointestinal spasm; it is used externally for treatment of skin, mucous membrane and ano-genital inflammations and for bacterial skin diseases.

Thorne Research Inc. (2008) describes the medicinal properties of chamomile as follows:

Several pharmacological actions have been documented for German chamomile based primarily on *in vitro* and animal studies. Such actions include antibacterial, antifungal, anti-inflammatory, antispasmodic, anti-ulcer, antiviral, and sedative effects.

The constituents of chamomile thought to have antimicrobial properties include alpha-bisabolol, luteolin, quercetin, and apigenin. Herniarin may also have antibacterial and antifungal properties in the presence of ultraviolet light…. Chamomile oil, at a concentration of 25 mg/ml, demonstrates antibacterial activity against… *Bacillus subtilis*, *Staphylococcus aureus*, *Streptococcus mutans*, and *Streptococcus salivarius*, as well as some fungicidal activity against *Candida albicans*. Whole plant chamomile extract at 10 mg/ml demonstrates a similar effect…. Chamomile extract has also been shown to inhibit the growth of poliovirus and herpes virus…. Chamazulene, alpha-bisabolol, flavonoids, and umbelliferone display antifungal properties against *Trichophyton mentagrophytes* and *Trichophyton rubrum*.

The high alpha-bisabolol content in chamomile oil is credited for providing the majority of antibacterial, antifungal, anti-inflammatory, and anti-ulcer activity, although the precise mechanism of action remains unclear.

In vitro, chamomile extract inhibits both cyclooxygenase and lipoxygenase, and consequently prostaglandins and leukotrienes. Other anti-inflammatory effects are thought to occur via the influence of azulenes (chamazulene, prochamazulene, and guaiazulene) on the pituitary and adrenals, increasing cortisone release and reducing histamine release.

Chamomile extracts exhibit antispasmodic properties. Apigenin, alpha-bisabolol, and the cisspiroethers appear to provide the most significant antispasmodic effects.

… *In vitro studies* demonstrate α-bisabolol inhibits gastric ulcer formation induced by indomethacin, ethanol, or stress. Oral administration of chamomile oil to rats at doses ranging from 0.8–80 mg/kg bisabolol demonstrate significant protective effect against gastric toxicity of 200 mg/kg acetylsalicylic acid.

... Apigenin functions as a ligand for benzodiazepine receptors, resulting in anxiolytic and mild sedative effects, but no muscle relaxant or anticonvulsant effects.

Research is exploring the anti-proliferative and apoptotic effects of chamomile extract in various human cancer cell lines. One preliminary study observed that *in vitro* exposure to chamomile results in differential apoptosis in cancer cells but not in normal cells at similar doses; apigenin and apigenin glycosides appear to be the key components responsible for these effects.

Oil of German chamomile, extracted through steam distillation, is an excellent skin tonic and is used to treat skin allergies, eczema, psoriasis and other flaky skin conditions; the high α-bisabolol content promotes granulation (healing) and tissue regeneration.

Further information on the pharmacological properties and potential of chamomile can be found in a recent review by Gupta *et al.* (2010).

27.3.3 Roman chamomile

There are two distinct varieties of Roman chamomile, the single and the double, indicating the number of layers of ray florets. The single-flowered is more powerful having higher content of alkaloids, while the double-layered variety is milder and is preferred for the preparation of herbal teas and other herbal medicines and also in cooking.

Roman chamomile contains mainly the terpenoids chamazulene and bisabolol; other constituents are flavonoids (such as apigenin, luteolin and quercetin), couma-rins (scopoletin-7-glucoside) and acids and esters (such as angelic and tiglic acid esters, anthemic acid, choline, phenolic and fatty acids) (Gardner, 1999).

27.3.4 Medicinal uses of Roman chamomile

Roman chamomile has tonic, anodyne and antispasmodic properties. The infusion of flowers in boiling water, known popularly as chamomile tea, has long been known for its soothing and sedative effects. When combined with ginger, the infusion is an excellent stomachic in cases of indigestion (e.g. flatulent colic, heartburn, loss of appetite) and also for the treatment of gout and headache. The flowers of Roman chamomile are known for their diuretic properties (Anon., 2009).

Chamomile flowers are also extensively used by themselves, or combined with other ingredients, as a poultice and fomentation for the treatment of external swelling, inflammatory pain or congested neuralgia. The whole herb is also used to make a lotion for external application in cases of toothache, earache, neuralgia, etc.

Roman chamomile oil, extracted through steam distillation of flower heads, has a sweet, apple-like fragrance and is very light clear blue in colour. The oil is very effective when administered to children who are teething or are suffering from colic. It is also used to relieve premenstrual symptoms in women, and also for general abdominal pain and throat infections. It can be used to relieve allergies, hay fever and asthma. Like German chamomile, it is effective when used to treat skin conditions such as acne, eczema, rashes, dermatitis and allergic reactions.

27.3.5 Culinary uses for German and Roman chamomile

Both chamomiles are most famous as a herbal tea, either used alone or in combination with true tea. Chamomile is an aromatic herb and is used widely in European cooking to impart additional flavour.

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Sleep

George M. Kapalka, in Nutritional and Herbal Therapies for Children and Adolescents, 2010

Chamomile

Chamomile (*Matricaria Recutita*), also referred to sometimes as German chamomile, is an herb that it approved by Commission E to treat cough and bronchitis, fevers, cold, inflammation, infection, wounds, and burns. It is believed by some to have sedative and anticonvulsant effects, and a small amount of research supports these effects (Medical Economics, 2007). As discussed in Chapter 8, it may offer some benefits as an anxiolytic, and consequently some have argued that it may have some hypnotic effects, but many researchers disagree and maintain that chamomile is not effective as a sleep aid (Morin *et al*., 2007). Indeed, there is no empirical evidence supporting its use as a hypnotic (Medical Economics). While no significant dangers are associated with the use of chamomile and the herb is usually well tolerated, its use as a sleep aid is not likely to produce any beneficial effects and parents and clinicians are encouraged to try more effective alternatives.

Herbal medicine and dietary supplement induced ocular side effects

Frederick T. Fraunfelder MD, in Clinical Ocular Toxicology, 2008

Primary use

Chamomile is used to treat inflammation of the eye as well as insomnia, indigestion, migraine headaches, bronchitis, fevers, colds, inflammation and burns. The indications for the eye include eye irritation, styes, epiphora and inflammation.

Ocular side effects

Local ophthalmic use or exposure

Certain

1. Allergic conjunctivitis (severe)
2. Angioedema

Clinical significance

Chamomile tea, which is a common drink worldwide, is made from the dried flower heads of the German or common chamomile plant. There is strong evidence that this tea, when applied topically in or around the eye, can cause a severe conjunctivitis. Subiza et al (1990) described seven patients who rinsed their eyes with chamomile tea to treat styes and runny, irritated eyes. All subjects developed severe conjunctivitis, with angioedema occurring in two patients. All seven subjects had a history of seasonal allergic rhinitis.

A possible mechanism for these patients' conjunctivitis could be sensitivity to the allergens present in *Matricaria chamomilla* pollen. Cross-reactivity with other allergenic pollens to which the patient is already sensitive could lead to the severe conjunctivitis observed in Subiza's study. Because patients are using chamomile to

treat their eyes, clinicians should recognize the possibility of *Matricaria chamomilla* sensitivity in cases of what appears to be allergic conjunctivitis, especially in patients who already have an atopic history.

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Pharmacological properties of some medicinal plants, its components and using fields

Hajjaj Ghizlane, Bahlouli Aziz, in Fruits, Vegetables, and Herbs, 2016

Description

Chamomile is an annual plant with thin spindle shaped roots only penetrating flatly into the soil. The branched stem is erect, heavily ramified, and grows to a height of 10–80 cm. The long and narrow leaves are bi- to tripinnate. The flower heads are placed separately, they have a diameter of 10–30 mm, and they are pedunculate and heterogamous. The golden yellow tubular florets with 5 teeth are 1.5–2.5 mm long, ending always in a glandulous tube. The 11–27 white plant flowers are 6–11 mm long, 3.5 mm wide, and arranged concentrically. The receptacle is 6–8 mm wide, flat in the beginning and conical, cone-shaped later, hollow the latter being a very important distinctive characteristic of *M. chamomilla* L. and without paleae. The fruit is a yellowish brown achene (Franke, 2005) (Fig. 3.1).

Figure 3.1. *Matricaria chamomilla* L.

http://en.wikipedia.org/wiki/Chamomile

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Assessment, Methodology, Training, and Policies of Sleep

J.C. Ong, R. Manber, in Encyclopedia of Sleep, 2013

Natural Products

Natural products consist of herbs or botanical products, vitamins, and minerals that are typically sold in stores as dietary supplements. Use of natural products for sleep is increasing, as a recent study found that a larger proportion of people used natural products compared to prescription medications for sleep in the preceding year. Individuals who use natural products are more likely to be female, young, and more educated compared to nonusers. They are also likely to follow health-oriented practices such as regular exercise. Therefore, there appears to be a perception among the general public that natural product use reflects a healthy lifestyle. However, research has yielded very little evidence to support the health benefits of natural products and there are some indications of potential risk.

The most common natural products used for insomnia are Chamomile, Valerian, St. John's wort, and Kava Kava. Other natural products include compounds that combine several herbs but there is no evidence that these combinations have additional benefits above and beyond a single compound.

Chamomile

Chamomile (*Matricaria recutita*, *Chameamelum nobile*) is a herb that is thought to aid in relaxation and enhance sedation. It is typically used as a 'bedtime tea' and its effects might be similar to benzodiazepines. It has been hypothesized that the calming effects of Chamomile might help to reduce arousal or anxiety at nighttime or promote sleepiness. However, no studies have identified the mechanism of action and no clinical studies have demonstrated any significant benefits for relaxation or sleep.

Valerian

Valerian (*Valeriana officinalis vs. edulis*) is a herb that is often used to reduce anxiety and promote sedation. The herb is extracted from a solution that typically contains a combination of water, ethanol, or methanol. The extraction is then served as a tea or taken as a capsule or tablet about 30–60 min prior to bedtime. Valerian has been researched in several studies and found to be safe but lacking significant efficacy. Although not a safety risk, Valerian emits an odor that some people find adverse and difficult to tolerate. Still, this is probably the most commonly used natural product for insomnia and is almost always included as an ingredient in combination compounds for sleep.

St. John's Wort

St. John's wort is a herb that is used for depression, anxiety, and insomnia. The active mechanism appears to involve Hyperforin, hypothesized to be a reuptake inhibitor of serotonin, norepinephrine, dopamine, gamma-aminobutyric acid, and l-glutamate. However, the findings are not yet conclusive. There is evidence to support the use of St. John's wort in the treatment of mild or moderate depression, with some limited data on the effects of sleep associated with depression. Notably, there are safety issues associated with St. John's wort including drug interactions, serotonin syndrome, and gastrointestinal distress. The efficacy of using St. John's wort in the treatment of primary insomnia (not associated with depression) is lacking.

Kava Kava

Kava Kava (*Piper methysticum*) is thought to aid in coping with stress by reducing anxiety and sleep disturbance. However, there is no evidence to support its

treatment efficacy for insomnia, and Kava Kava has been associated with severe liver toxicity. Therefore, it is not recommended for the treatment of insomnia.

Other Natural Products

In addition to these herbal products, some vitamins and supplements have been used in the treatment of insomnia. Preliminary evidence has revealed modest improvements on sleep for a cherry extract when compared to a placebo beverage. l-tryptophan and 5-Hydroxytryptophan (5-HTP) have demonstrated some limited efficacy in improving sleep latency, but these supplements are also associated with the risk of developing eosinophilia–myalgia syndrome, a neurological condition that is sometimes fatal. There are claims that Vitamin B improves sleep but studies examining the impact of Vitamin B12 on sleep found no conclusive evidence. In fact, there is an association between increased sleep disturbance and use of vitamins, although causality has not been established.

Despite their association with a healthy lifestyle, natural products should be used with caution in the treatment of insomnia. There is very little evidence of efficacy for treating insomnia and some products have known risks associated with their use. Furthermore, in many countries, these products are not subjected to the regulations that are required of prescription medications. Therefore, the purity of the substance might not be standardized. Patients should inform their health-care provider of the use of any natural products given their potential interactions with prescription medications and the side effects.

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Antioxidant Activity and Protecting Health Effects of Common Medicinal Plants

Soňa Škrovánková, ... Ludmila Machů, in Advances in Food and Nutrition Research, 2012

4.5.1 Chamomile *(Matricaria chamomilla)*

For the antioxidant activity of chamomile essential oil is responsible especially sesquiterpenes, and some monoterpenes too. The highest concentrations were calculated for chamazulene, α-bisabolol, and bisabolol oxide A (appreciatively the same concentration for each component) (Costescu et al., 2008). In addition, guaiazulene was identified in the essential oil (Romeilah, 2009). Chamazulene exerts antioxidant effects through the inhibition of lipid peroxidation and blocks chemical peroxidation of arachidonic acid for antioxidant effects. It was found that guaiazulene could inhibit lipid peroxidation very significantly, and can scavenge hydroxyl radicals and interact with DPPH. Also essential chamomile oil showed good antioxidant capacities compared with vitamin C (Romeilah, 2009). Also Owlia, Rasooli, and Saderi (2007) referred that essential oil from chamomile showed good antioxidative potential. Abdoul-Latif et al. (2011) determined that chamomile essential oil and methanol extract inhibited the oxidation in the β-carotene-linoleic acid system effectively. When compared to BHT, the essential oil and methanol extracts were nearly the same value. Sazegar et al. (2010) determined the antioxidant activity of chamomile ethanol extract, also in fat-containing foods (sunflower oil). The antioxidant activity was valuable and rose by increasing the extraction oil concentrations due to presented antioxidants.

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Volume 3

Ebenezer Olatunde Farombi, ... Solomon Eduviere Owumi, in Encyclopedia of Food Chemistry, 2019

Apigenin

Many fruits and vegetables such as parsley, celeriac, celery and chamomile tea are rich in apigenin. Apigenin demonstrated ability to halt cancer growth in a wide range of cancers including liver, pancreatic, colorectal, blood, prostate, breast, lung, thyroid, skin, neck and head, and bone cancers by a variety of mechanisms. Examples include reduction of Snai1 and NF-κB expression, leading to reversal of increased epithelial-mesenchymal transition (EMT) marker levels, improved cellular adhesion, controlled actin polymerization and cell migration, and inhibited invasion and migration in experimental liver cancer. Others include inhibition of STAT3 signalling evident from up-regulated levels of cleaved caspase-8 and caspase-3, and provoked cleavage of PARP. Another mechanism involved induction of extrinsic apoptosis, blockage of the phosphorylation of JAK2 and STAT3 in addition to inhibition of $CoCl_2$-induced VEGF secretion and decreased nuclear staining of STAT3 in breast cancer cells. Apigenin also acted as an anti-cancer agent through binding with IKKα, attenuation of IKKα kinase activity and suppression of NF-κB/p65 activation leading to inhibition of cell proliferation, invasiveness and decrease in tumor growth in experimental prostate cancer. Lastly, apigenin stimulated the mitochondrial pathway of apoptosis, modified expression of apoptotic proteins, as well as significantly up-regulated the expression of cytokine genes IL17F, LTA, IL17C, IL17A, and IFNB1 in experimental pancreatic cancer (Salmani et al., 2017). Apigenin and quercetin (25 and 50 mg/kg) were equipotent in dose-dependent inhibition of melanoma growth following their intraperitoneal administration at the time of i.m. injection of B16-BL6 cells into female C57BL/6N syngeneic mice. EGCG at 50 mg/kg was found to be more effective than apigenin and quercetin (Caltagirone et al., 2000). Also, 50 mg/kg apigenin administered i.p. to female Sprague Dawley rats for 21 days prevented the development of medroxyprogesterone acetate accelerated 7,12-dimethylbenz(a)anthracene-induced mammary tumors in Sprague Dawley rats (Mafuvadze et al., 2011) while 20 mg/kg apigenin administered i.p. to C57BL/6 mice showed anti-tumoral effect in malignant mesothelioma induced by transplanting mice with MM# 40a cells forming ascites (Masuelli et al., 2017). In another study, inclusion of 0.1% apigenin and 0.02% naringenin in diet of male Sprague-Dawley rats for 10 weeks suppressed colon carcinogenesis in azoxymethane-treated rats (Leonardi et al., 2010).

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