

## Damask Rose: Therapeutic Potential

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### Introduction:

The most important aromatic, medicinal and aesthetic plant is the deciduous shrub known as the damask rose (*Rosa damascena* Mil.) from Rosaceae family. It is the most lucrative kind of rose that is produced for the creation of rose water and rose oil, which are mostly used in the perfume industry and as culinary flavourings (Mirzaei *et al.*, 2016). More than 200 species and 18,000 cultivars of the Rose genus can be found worldwide. Its origin has long been thought to have originated in the Middle East. Because it is a hybrid of *Rosa fedtschenkoana* crossed with the pollens of *Rosa moschata* x *Rosa gallica*, new genetic investigation indicates that its more likely origin is in the home of its pollen parents, i.e., the foothills of central Asia. For its oil-rich components, the damask rose requires humid air and moderate temperatures during the blossoming season. Damask roses thrive in the temperate regions found between 300 and 1800 metres above sea level (Loghmani-Khouzani *et al.*, 2007). For the large-scale production of rose oil, it is mostly grown in Turkey, Bulgaria, Pakistan, Italy, France, Russia, India and Morocco. Fresh damask rose petals possess a very little amount of essential oil. Around 1 kilogram of rose oil is produced from 3000 kg of rose petals.

### Chemical analysis of damask rose

Terpenes, glycosides, flavonoids and anthocyanins are the significant ingredients found in *R. damascena*. Moreover, this rose includes carboxylic acid, myrcene, vitamin C, kaempferol and quercetin. Furthermore, it has organic acids and fatty oils. The principal constituents of the oil were nerol and kaempferol, as well as the discovered chemicals - citronellol, nonadecane and geraniol (Labban and Thallaj, 2020). The abundance of the u-3

fatty acid, also known as a-linolenic acid, found in the damask rose seed oil, which is absent or present in very little amounts in other plants, makes this fatty acid extremely important.

### **Medicinal properties of damask rose**

#### **1. Antioxidant and anti-inflammatory effects:**

The Damask Rose has powerful anti-oxidant and lipid peroxidation-inhibitory properties comparable to those of Vitamin E, indicating that it may be used to cure and prevent a number of diseases caused by free radicals. The vitamin C in the rose also has anti-inflammatory and antioxidant properties. It has been demonstrated that giving rheumatoid arthritis patients 10 g of rose hip powder for a month has no anti-inflammatory or antioxidant effects. Anti-inflammatory effects are produced by unsaturated fatty acids, triterpenic acids, or unknown substances and their combined actions.

#### **2. Antibacterial effects:**

Both gram-positive and gram-negative bacteria were sensitive to rose absolute's antibacterial effects. The three strains of *Xanthomonas axonopodis* spp. were noticeably reduced in their growth by the essential oil of *R. damascena*. Major rose oil constituents citronellol, geraniol and nerol have been shown to have antibacterial properties. The high phenylethyl alcohol concentration of rose absolute may be responsible for its antibacterial effects.

#### **3. The analgesic effect:**

Flavonoids are in *R. damascena*. It has been hypothesised that the water-insoluble compounds quercetin and kaempferol may be to blame for this outcome. Antioxidants found in *R. damascena* may help people feel less discomfort. The analgesic effects that have been noted are thought to be caused by the water-insoluble compounds kaempferol and quercetin.

#### **4. Anticonvulsant effect:**

Patients utilising rose essential oil experienced a significant decrease in the mean frequency of seizures. Flavonoids and other elements of *R. damascena* essential oil, such as geraniol and eugenol, implicated in preventing epileptic seizures. Thus, *R. damascena* essential oil has a positive antiepileptic effect in kids with refractory seizures (Labban and Thallaj, 2020).

#### **5. Anticancer Activity:**

The damask rose has cytotoxic, antitumor and anticarcinogenic effects on cancer cells. It causes the G0/G1 phase of the cell cycle to be arrested, reduces cdk2 activity and inhibits the activity of 3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) reductase and ornithine decarboxylase, which leads to the death of cancerous cells. It also induces apoptosis in cancer cells and increases the expression of the apoptotic protein Bak.

#### **6. Adaptogenic/Antistress Activity:**

By blocking the calcium channels of the tracheal chain and the histamine H1 receptors, the damask rose inhibits the electrical field stimulation and contraction caused by KCl. By inhibiting tachykinin and reducing citric acid, which causes coughing, Damask rose aqueous and ethanol extracts have bronchodilatory and antitussive actions.

#### **7. Antidiabetic Activity:**

The  $\alpha$ -glucosidase enzyme is inhibited noncompetitively by damask rose extract. In both diabetic and healthy rats, the oral administration of (100–1000 mg/kg body weight) of the damask plant's extract was demonstrated to reduce the blood glucose level after the insertion of maltose in a dose-dependent way. According to the results of this study, the postprandial glucose level was found to be lower because there was less absorption of carbs from the intestine, indicating damask rose may have anti-diabetic properties.

#### **8. Anti-HIV effects:**

*R. damascena* extracts in water and methanol have revealed anti-HIV infection activity. The most effective compounds against HIV infection of C8166 cells were kaempferol 1 and its 3-O-D-glucopyranosides 3 and 6. Due to the presence of the galloyl moiety, Compound 8, a novel natural compound, demonstrated modest anti-HIV activity even though 2-phenylethanol-O-D-glucopyranoside was inert (Shabbiret *et al.*, 2020).

#### **9. Cardiovascular effect:**

The effectiveness of damask rose in treating cardiovascular problems has received less attention in the literature. By administering an aqueous ethanolic extract of damask rose, the guinea pig's heart showed enhanced contractility and heart rate. Currently, a novel chemical called cyanidin-3-O-b-glucoside is being extracted from the damask rose "buds." This substance has the ability to significantly reduce ACE activity. Damask rose may be useful in improving cardiovascular function since ACE is a crucial enzyme in the synthesis of angiotensin II.

**10. Neuropharmacological effects:**

Dementia treatment with *R. damascena* is believed to be useful. In research, it was discovered that the chloroformic extract of *R. damascena* dramatically increased neurite outgrowth activity and decreased amyloid (A), the primary cause of Alzheimer's.

**11. Soothing effect:**

Similar to diazepam, Damask Rose can lengthen the period that pentobarbital induces sleep. Flavonoids and terpenes are just a couple of the ingredients found in *R. damascena*. These chemicals have a calming impact. As a result, it is hypothesised that these substances may be to blame for *R. damascena* calming effects (Mahboubi, 2016). Several studies have demonstrated the anxiolytic and/or depressive effects of flavonoids. It was proposed that flavonoids may have something to do with the calming effect.

**12. Anti-Aging properties:**

Vitamin C in the Damask rose, which is the primary reason it's so great for the skin. Another reason is its production of elastin and collagen, making the skin firm and ultimately avoiding premature aging.

**Conclusion:**

One of the most significant members of the Rosaceae family, *R. damascena* is primarily appreciated for its aroma and rose water. Terpenes, glycosides, flavonoids and anthocyanins are just a few of the medicinally useful substances found in this plant. *R. damascene* has several different pharmacological actions. Analgesic, anticonvulsant and sedative actions make up the majority of CNS effects. This plant also has benefits on the circulatory, respiratory, laxative, anti-diabetic, anti-HIV, anti-microbial, inflammatory and antioxidant systems. According to speculation, the majority of the aforementioned effects are mostly caused by this plant's lipid soluble (non-polar) ingredients. Roses are primarily valued for their beauty, but they also have medicinal uses. Regrettably, more pharmacological research is required to determine its therapeutic potential.

**References:**

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