



MEDICINAL USES AND PHYTOCONSTITUENTS OF *PAEONIA OFFICINALIS*

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ABSTRACT

Paeonia officinalis (European peony, Common peony) has been cultivated in Europe for years. The root has been used medicinally for over 2,000 years mainly in the treatment for epilepsy and to promote menstruation. Root is also antispasmodic, diuretic, sedative and tonic and has been successfully employed in the treatment of convulsions and spasmodic nervous affections such as epilepsy. It has also been used in the treatment of whooping cough whilst suppositories are sometimes made of the root to relieve anal and intestinal spasms, hemorrhoids and varicose veins. Experimentally it has been proved to have antihypertensive, abortifacient action and anti-ulcer activity. The roots of this plant are of great medicinal significance in unani system and homeopathy. The roots contain asparagin, benzoic acid, flavonoids, paeoniflorin, paeonin, paeonol, protoanemonin, tannic acid, triterpenoids, and volatile oil. This review covers botany, traditional uses and the phytoconstituents of the roots of *Paeonia officinalis*.

Key words: European peony, root, abortifacient, paeoniflorin, paeonin

INTRODUCTION

Plant Monograph

Classification:

Botanical name: *Paeonia officinalis* L.

Vernacular name: Peony (English), Ood Saleeb (Unani, Arabic)

Kingdom: Plantae – Plants

Subkingdom: Tracheobionta – Vascular plants

Superdivision: Spermatophyta – Seed plants

Division: Magnoliophyta – Flowering plants

Class: Magnoliopsida – Dicotyledons

Subclass: Dilleniidae

Order: Dilleniales

Family: Paeoniaceae – Peony family

Genus: *Paeonia* L. – peony¹

Synonyms: *Paeonia femine* L., *Paeonia foemina* Gars, *Paeonia fulgida* Sabine, *Paeonia foliis* Lobatis ex ovato, *Paeonia folio nigricante*^{2,3}

Distribution

Paeonia officinalis is native to south-eastern Europe but it has been widely introduced elsewhere as a garden plant. It is a rare and protected species, mostly occurs in open and semi-open habitats and is often threatened by forest and shrub land spread. There are many varieties, the most popular being the double forms with dark-red blooms^{1,4}.

Description Of *Paeonia officinalis*

It is a perennial herb with tuberous fleshy roots and a stout, erect, branched, glabrous stem. The leaves are ternate or biternate and have ovate lanceolate segments, dark green colour above and lighter below. It has terminal, showy, wine red or white flowers, which have eight petals and five petal-like sepals. The fruit is a capsule with shiny black seeds⁴. The roots and seeds of Peony have, when fresh a faint unpleasant smell and a mucilaginous subacid taste, with a slight degree of bitterness and astringency. On drying they lose their smell, and a part of their taste. The flowers have rather more smell than any of the other parts of the plant, and a rough sweetish taste¹.

Part Used

Dried and powdered roots of *Paeonia officinalis* are used as a medicine in both Indian and Chinese system of medicines. The roots are cleansed carefully in cold water with a brush and allowed to remain in the water for a short period of time.

Then they are spread out on trays in the sun, or on the floor, or on shelves in a kitchen, or other warm room for ten days or more. When somewhat shrunken, roots may be finished off more quickly in greater heat over a stove or gas fire, or in an open oven, when the fire has just gone out. Dried roots must always be dry to the core and brittle. Peony root occurs in commerce in pieces averaging 3 inches long and 1/2 to 3/4 inch in diameter, spindle-shaped, strongly furrowed and shrunken longitudinally, of a pinkish grey or dirty white colour, generally having been scrapped. The transverse section is starchy and radiate, the rays more or less tinged with purple^{5,6}.

Chemical Constituents

Unsaponifiable lipid from root oil has been seen to contain C14-33n-alkanes, butyrospermol, cycloartenol, lupeol, 24-methylenecycloartenol, cholesterol, campesterol and sitosterol. Saponifiable lipid has been reported to contain octanoic, decanoic, lauric, myristic, myristoleic, palmitic, palmitoleic, stearic, oleic and linoleic acid⁴. Apart from these the root also contains: asparagin, benzoic acid, flavonoids, paeoniflorin, paeonin, paeonol, protoanemonin, tannic acid, triterpenoids, and volatile oil¹.

Traditional Uses

In ancient times the peony was held in high esteem as a medicinal plant. Paian, the physician of the Greek gods, gave the plant its name; with peony roots he healed Hades, god of the underworld, who had been wounded by Heracles. The peony was mentioned again and again in herbals of Greek and Roman times and the Middle Ages⁷. In the middle ages peonies were often painted with their ripe seed-capsules, since it was the seeds, not the flowers, which were medically significant. The physicians of those times recommended peonies for curing, among other things, bladder stones, jaundice, stomach ache, diarrhoea, labour pains, nightmares, epilepsy, and lunacy. Usually the roots and seeds of the plants were used⁸. Since the time of Hippocrates (470-377 BC), *Paeonia officinalis* was used for treating epilepsy, Ibn-el-Beitar, a medieval Arab physician, also recommended it for epilepsy⁹.

- *Paeonia officinalis* has been used in Unani system of medicines for years. In Unani medicine it is known as Ood Saleeb and is an ingredient of many Unani

preparations which are used as antispasmodic, anti-inflammatory, heart tonic, demulcent, neuroprotective, antiepileptic, also in the treatment of paralysis, infantile epilepsy, chorea, hysteria, cerebral atony and nervous debility^{10, 11}.

- In ayurvedic medicine, *Paeonia officinalis* is a part of medicinal preparations used in the disease states like: jaundice, dropsy, hepatitis, hepatomegaly, metritis, splenomegaly, and liver dysfunction, and spleen dysfunction, lack of appetite, cirrhosis, sluggish liver¹².
- In Chinese medicine, *Paeonia officinalis* is an ingredient of medicinal preparations used in the treatment of liver diseases¹³.
- In homeopathy, *Paeonia officinalis* is used in the treatment of hemorrhoids, as diuretic, vasoconstrictive, sedative, anti-rheumatic, anti-gout, kidney stone disease, anticonvulsive, pain relief, cystitis, hysteria, bronchospasms, asthmatic bronchitis, gall stone disease, gall diskinesis, antispastic, liver problems, memory enhancer, migraine, tumors, sore throat, conjunctivitis, sexually transmitted disease, varicose veins, depression, constipation, paralysis, facial paralysis, meningitis, epilepsy^{14,15}.

Pharmacological Activity

- a) Abortifacient action: A crude alcohol extract of the root has been proved to produce uterine stimulation in the rat¹⁶.
- b) Anti-hypertensive action: An alcoholic extract of paeonia officinalis has been reported to lower blood pressure in rats. It was also found to produce digitalis-like action on frog heart^{16, 17}.
- c) Anti-Ulcer action: *Paeonia officinalis* has been reported to cure six months ulcers of coecyx, foot, breasts¹⁸.

Adverse Reactions

Use of this drug in traditional system of medicines has reported to produce: blistering of mouth and throat, diarrhea, dizziness, fainting, gastroenteritis, hematuria, nausea, salivation, stomach pain, vomiting and/or possible death¹.

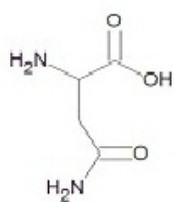
CONCLUSION

Paeonia officinalis is widely used in the traditional Indian and Chinese system of medicines. Other species of paeonia

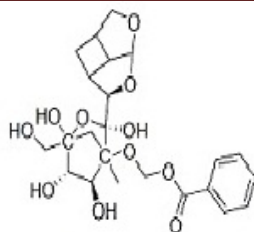
like *Paeonia lactiflora* (Chinese paeonia), *Paeonia radix* (white paeonia) and *Paeonia suffruticosa* are widely used in traditional Chinese medicine (TCM) to treat various disorders have been proved to be effective scientifically as well. However, there is not enough scientific proof to validate the medicinal use of *Paeonia officinalis*. Thus we need more intensive scientific research is needed to authenticate if *Paeonia officinalis* has any of the medicinal activities which the traditional systems claim.

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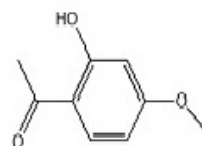
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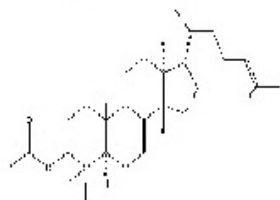
Asparagine



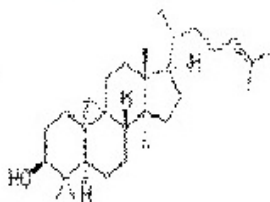
Paeofflorin



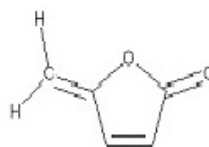
Paeonol



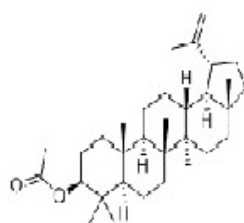
Butyrospermol



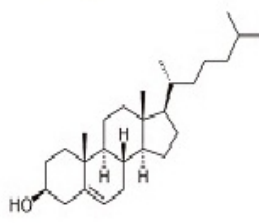
Cycloartenol



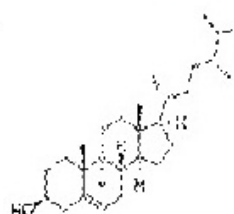
Protoanemonin



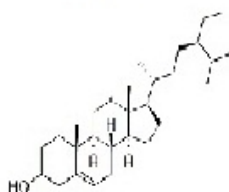
Lupeol



Cholesterol



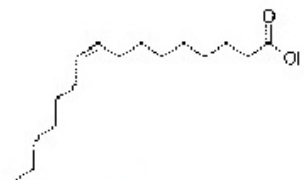
Campesterol



Sitosterol



Octanoic acid



Palmitoleic acid



Decanoic acid



Lauric acid



Myristic acid