A Review Article on Phytochemistry and Pharmacological Profile of *Punicagranatum*

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**Abstract:** *Punicagranatum, the pomegranate, is a fruit-bearing deciduous shrub or small tree native to the region from Persia to northern India and has been cultivated and naturalized over the whole Mediterranean region and the Caucasus since ancient times. Different varieties are identified among the ornamental variety, the double flower type wherein numerous stamens are modified into petals; some of these cultivars are fertile and set edible fruits while others are infertile. These infertile double flowers are used as medicine as they exhibit various pharmacological activities such as antidiabetic, antithrombotic, wound healing, anti-inflammatory, anti-oxidant activity etc.*

**Keywords:** gulnar, pharmacological activities, phytochemistry

1. **Introduction**

*Punicagranatum Linn.* is a shrub that naturally tends to develop multiple trunks and has a bushy appearance. Different varieties are identified among the ornamental variety, the double flower type wherein numerous stamens are modified into petals; some of these cultivars are fertile and set edible fruits while others are infertile. These infertile double flowers are used as medicine.

**Botanical classification**

- **Kingdom:** Plantae
- **Family:** Lathyraceae
- **Genus:** Punicaeae

**Botanical name:** *Punica granatum*

**Part used:** Flowers, rind of fruit, fresh fruit juice, dried bark of stem and root, leaves, seeds

**Part studied:** Flowers

**Vernaculars:**

- Arabic: *Rumman*
- Bengali: *Dalimgach*
- English: *Pomegranate*
- French: *Grenadier cultive*
- Gujarati: *Dadam*
- Hindi: *Anardana, Anar*
- Malayalam: *Matala*
- Persian: *Gulnar, darakhteanar*
- Kannada: *Dalimby, Dalimbuhanu*
- Sindh: *Anardana*
- Konkani: *Dalimba*
- Telegu: *Dalima, dalimba*
- Tamil: *Madalai*

**Mahiyat**

Gulnar are buds of a pomegranate tree which are infertile. Flowering is seen in every season more often in spring. Flowers are tubular, white and red and pink. Better quality is fresh farsi and bright red. It is of two varieties wild *jungli* domestic (*bustani*); *jungli* is more potent and is used medicinally.

**Mizaj**

Cold and Dry in 2°. 7, 8, 9, 10, 11, 12, 13, 14

**Miqdarekhurak**

7 gm. 7, 12

**Muzir**

Headache and obstructed to intestines. 7, 8, 9, 10, 12, 15

**Musleh**

*Kateera* 7, 10, 12, 15.

**Badal**

Chaleanaar and *juftebaloot* 10, 13, 15

**Istemaal**

1) **Qabiz** 7, 10, 11, 12, 13, 18
2) **Barid** 17
3) **Habis** 10, 12
4) **Radi** 7
5) **Muqawwi** 12
6) **Mundammil e qurooh** 7
7) **Mujaffif** 7, 12, 13, 18
8) **Jali** 7
9) **Mutayyibe dehen** 7, 12

**Afaal**

1) Due to its astringent property, it is used in hemorrhage from any organs of body. 7, 13, 14
2) Its powder is used locally in menstragation.
3) Its decoction is used as sitz bath in leucorrhoea
4) It is used in stomatitis, hematemesis, and hemoptyis.
5) Its powder and decoction is useful in bleeding gums. 7, 17, 8, 14
6) It is used as decoction along with vinegar in halitosis.
7) It causes constipation.
8) It is mucilaginous and styptic thus produces sawda. 7, 14
9) It is used as purgative to remove morbid matters of stomach. 7, 13, 14
10) Paste of internal petals in the form of pessary or enema is used in piles and fistula. 7, 14, 17
11) It stops bilious stool. 7, 13, 8, 14, 10
12) Its paste with *sirka* and *geru* if applied around inflammed areas stops *insebah* of madda. 7, 17, 13
13) It provides *quwa* to *aza*. 7
14) Its paste is useful in wound healing. 7, 13, 17, 14
15) Its extract with vinegar is used in *juumrah*. 7, 17
16) Due to its *raade* property, it is used ye reduce inflammations.7, 8, 10, 15. It is used in pruritus and burning sensation.7,13
17) Its eye drops reduces inflammation
18) If a healthy person consumes *gulnar* buds for a week or 3 buds a day he will be prevented from conjunctivitis for a year
19) *Gulnar* with grapes leaves if applied on epigastrium relieves hyperemesis.7,15

**Ethnobotanical description**
Pomegranate is considered as an excellent tree or growing in arid zone. It is now widely cultivated in mediterranean sea in tropical and subtropical areas. Under natural conditions it grows up to a height of 7 m and when domesticated it attains a height of 5 m. Bark smooth, dark grey; branchlets sometimes spiniscent; leaves 2.0 - 8.0 cm long, oblong or ovate, shining above; flowers usually scarlet red, sometimes yellow, 3.7 to 5.0 cm long and as much across, mostly solitary or 2 - 4 together; fruits globose, crowned by persistent calyx, with a coriaceous woody rind and an interior sepalate with membranous walls, containing numerous seeds; seeds angular with a fleshy sepa which is red, pink or whitish.

**Habitat and distribution**
Punica granatum, the pomegranate, is a fruit - bearing deciduous shrub or small treenative to the region from Persia to northern India and has been cultivated and naturalized over the whole Mediterranean region and the Cau casus since ancient times.

**Macroscopic characters**

**Colour** Brilliant orange - red,20,21 scarlet red.18
**Size** 4 - 6 cm
**Shape** Bell shape

**Microscopic characters**

**Petal** Thick middle, tapers at margin
**Midrib** 200 micron, thin, squarish adaxial epidermal cell
**Sepal** Thick in middle and gradually thin at margins
**Mid part** 1mm thick, epidermal layer of small cylindrical, squarish cells
**Ground tissue** Homogeneous and parenchymatous.

**Actions**
1) Antibacterial 18, 3, 5
2) Antioxidant 5
3) Astringent 2
4) Antidiabetic 4, 21
5) Antifungal 2, 24
6) Antiviral 2
7) Antitumour 2
8) Anticarcinogenic 2
9) Antiatherogenic 23, 88
10) Antihypertensive
11) Antioxidant 3, 23
12) Antiperoxidative 5
13) Anti diarrhoeal
14) Antisympotemic
15) Antacid 5
16) Hemostatic 22
17) Analgesic 5
18) Anti - inflammatory 4

**Uses**
1) Flower buds powdered in 4 to 5 grains used in and in nasal haemorrhage as nasal stuff.6
2) Juice of flower with juice of cynodon dactylon equal parts given to stop nose bleeding.
3) The flowers are stptic to the gums; check vomiting; useful in biliousness, sore eyes, ulcers, sore throat, applied to hydrocele 27
4) Dried flowers are used in compound powder; composed of these dried flowers 1 drachm, gum arabic 1 drachm, dragons blood 2 drachm and opium 8 grains, this is useful in hematuria 28 hemorrhoidal flux, hemoptysis, dysentery e. t. c. Dose is 10 to 15 grains.
5) It is used in wide variety of diseases such as wound healing, peptic ulcer, worm infestation, epistaxis uterine and rectal ulcer.6
6) Fresh flowers mixed with cardamom seed, poppy seeds and mastic and made into linctus used in chronic diarrhoea6,20 and chronic dysentery 20, 21, 29
7) This flower was also used for the treatment of injuries from falling and greying of hair.2
8) Pomegranate flower extract reduces the factors that can result in cardiac impairing fibrosis in patient with type 2 diabetes 5

**Chemical constituents**
The most therapeutically beneficial pomegranate constituents are 23 - ellagic acid, 2 - ellagitannins, punicalagin spunic acid, 28 flavonoids, 23, 28 anthocyanidins, 28 anthocyanins, estrogenic flavonols, flavones, 28 orulosic acid, 29 orulosic acid, 2, 89 gallic acid, 2, 88, 30, maslinic acid, 2, 88 daucosterol, 2, 89 tannins 87, asiatic acid 26

**Pharmacological activity**

**Anti - inflammatory activity**
The phytochemical analysis of flower extract revealed that it contains flavonoids. Flavonoids are well known for their ability to inhibit pain perception. Inhibition of inflammation by pomegranate components involves inhibition of both COX and LOX enzymes and a decline in prostaglandin release from cells. Flavone, its methoxy derivatives exhibited significant dose dependent analgesic activity.4

**Antidiabetic activity**
Pomegranate flower extract (PFLE) improved insulin sensitivity and lowered glucose levels in rats as early as 30 minutes post - glucose loading 28. 26PFLE also inhibited alphaglucosidase in vitro, thereby decreasing the conversion of sucrose to glucose. 28

**Anti - oxidant**
The flower and peel extracts resulting from organic solvent extraction exhibited strong antioxidant activities which correlated with the high levels of total phenolics, flavonoids, and proanthocyanidins. Pomegranate flower extract had the most prominent flavonoid level followed by peel, leaf and stem. A study shows that flowers had the highest ferric reducing potential which was statistically different from the
activity of the other extracts (< 0.05) All extracts showed dose - dependent iron (II) chelating activity. However, pomegranate flower exhibited the highest iron (II) cation chelating activity.

**Antiatherosclerotic activity**

Punica granatum flower extracts more significantly affects atherosclerotic lesion size, lipid profiles and blood sugar levels than other extracts tested. ²

**Wound healing activity**

Punica granatum flowers showed significant wound healing activity. The wound area measurement showed significant reduction in the wound size as compared to nitrofurazone ointment. ²

**2. Discussion**

*Punica granatum (Gulnar)* is one of the prominent drug with multiple remedies. It has been described vastly in Unaniliterature. Present review states that the *gulnar* has so many pharmacological activity, thereby used extensively in various conditions.

**References**


