



Review Article

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A comprehensive review of phytochemical and pharmacological profile of Anar (*Punica granatum* Linn): A heaven's fruit

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ABSTRACT

Punica granatum Linn is a holy fruit belongs to Punicaceae family and its uses are mentioned in various ancient texts and religious books. (It was lauded within the Old Testament of the Bible, Qur'aan, the Judaic Torah, and also the Babylonian Talmud as a sacred fruit conferring powers of fertility, abundance, and sensible luck). Pomegranate is used in various systems of medicine. The biological properties of extracts (hypoglycaemic activity, immunomodulatory activity, analgesic activity, anticancer activity, etc.) obtained from many components of pomegranate is according within the gift work. Attributed to such properties, the extracts are used in medical specialty, like within the hindrance of infection, inflammation, cholera, impotence among different applications. Phytochemical screening of the *Punica granatum* exposed that it contain anthocynin, flavonoides, alkaloids, tannins, triterpenes and phytosterols. This text in short reviews the ethanobotanical properties furthermore as HEALTHFUL uses with plant description. This is a trial to compile and document data on totally different side and its potential use. A lot of studies are required before the pharmacologic properties of *Punica granatum* can be utilised in medical care.

Keywords: Fruit, Phytochemicals, Unani medicine, Diseases.

INTRODUCTION

The latin word pomum "apple" and granatus "seeded" is the source of name pomegranate. Seeded apple is the common name in different language. In early English, the Pomegranate was called "apple of Grenada" a term that these days survives solely in heraldic blazons. This was in all probability a people history, confusing Latin granatus with the Spanish town of Granada. UN agencies were active in broadening its cultivation, partially for spiritual reasons. In Latin, wherever "malum" was broadly speaking, applied to several apple-like fruits, name pomegranate was *malum punicum* or *malum granatum*, the latter produce to the Italian name melograno, or less unremarkably melagrana^[1].

Punica granatum nana is a species of *P. granatum* popularly known as bonsai trees and as a patio plant. The pomegranate ligneous plant, according to De Candolle, is originally a native of Persia and adjacent countries. Nowadays this tree is meet all the hotter and temperate countries of the globe. In wet areas, they're susceptible to root decay from fungal diseases. They are tolerant to moderate frost, down to about -10°C.

Assyrians and Egyptian considered the fruit sacred, and also the latter nation created it a custom to, however within the graves of the dead fruits of the sphere and garden, among them are pomegranates specimens that are preserved to the current day. It absolutely was often used as a secret emblem in beautifying the capitals of Assyrian and Egyptian columns. The Bible mentions that the capitals of the columns within the building of Solomon's temple were embellished with a "network of pomegranates." The pomegranate was one in every of the 3 fruits dropped at Moses by the lads that he sent to spy out the land of promise. Several different passages scattered throughout the Bible seek advice from the plant and testify to the esteem during which the tree and also the fruit (then referred to as rimmon) were command in past.

Arabian Nights also has the refrence of use of fruit and and seed of pomegranate. Pomegranates were depicted on Carthaginian and Phoenician medals and on the reverse of the coins of the island of Rhodes.

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In classical mythology the pomegranate is extremely conspicuous, and symbolizes fertility and abundance. The fruit was dedicated to Roman deity, a god continuously depicted in sculptures as holding a pomegranate, The Greek authors, e.g. Theophrastus, describe the pomegranate beneath the names of "roa" and "roa side" conjointly Dioscorides, quite expressly set forth the HEALTHFUL properties of the various components of the plant. Among Roman authors who mentioned the pomegranate and its uses are Cato Censorius, Pliny Celsus, and others. Subsequent writers, for instance the Arabs, within the ninth century.^[2]

TAXONOMICAL CLASSIFICATION:

The taxonomic classification of *Punica granatum* is as follows:

Kingdom:	Plantae
Division:	Magnoliophyta
Class:	Magnoliopsida
Order:	Myrtales
Family:	Punicaceae
Genus:	<i>Punica</i>
Species:	<i>granatum</i>

Synonyms^[3]

Granatum punica St Lag, *Punica florida* Salisb, *Punica multiflora* Hort,exSiebold and Voss, *Punica nana* Linn,*Punica spinosa* Lam, and *Punica grandiflora* Hort.exSteud

VERNACULAR NAMES:^[4]

Arabic:	Rumman, shajraturrumman
Assamese:	Dalim
Bengali:	Dalimgachh
Hindi:	Anar, Dhalim, Dharimb
Italian:	Melogrante
Malyalam:	Dadiman
Marathi:	Dalimba
Persian:	Anar, Darakhteanar
Philipin:	Granda
Punjabi:	Anar, Dan, Danu
Russian:	Granate, Granantik
Sanskrit:	Bijapura, Dadima, Dadimasara, Dalika
Spanish:	Grando
Swedish:	Granatrad
Tamil:	Kalumal madalai, Madulam, Madulangam
Telegu:	Didymium, Marimba
Turkish:	Nar agaci
Urdu:	Anarmitha
Uriya:	Dalimbo, Dalimo

HABITAT/ DISTRIBUTION

The pomegranate ligneous plant, according to De Candolle, is originally a native of Persia and adjacent countries, however has been cultivated associate degreed naturalized within the Mediterranean countries at such an early date that it's even been thought-about native to those countries cultivated from remote antiquity the native country of the pomegranate is somewhat unsure. It is, however, typically thought-about native in north western Republic of India, southern Persia, and maybe Palestine, and to possess been introduced at a far off amount within the Mediterranean countries of Europe and northern continent. Nowadays this tree is meet all the hotter and temperate countries of the globe; it's a lot of cultivated as a decorative ligneous plant for the sake of its terribly handsome flowers that are copiously made from Gregorian calendar month to September.^[5]

PLANT DESCRIPTION IN UNANI TEXTS

Anar is fruit of celebrated tree, its plant is cultivated all over in nice continent (Barre Azam) some plants are twenty feet tall, stem thin, dimension three or four feet, barks are some xanthous or dark brown in color, the new leaves are mature within the month of Gregorian calendar month of December and March, its leaves are organized within the front of branches. Some are elongated whereas others are xanthous red; the red flowers are organized two in one place, the fruits return when shedding of flowers. The diameter of pomegranate is roughly 3.5 inch; some are terribly huge as narrated in Tazke Jahangeri that one dropped at Emperor Jahangir weighed was forty tola (400 g). The seed of pomegranate, some are red, elongated whereas others are white. Generally seeded, some are seedless or week seed; Kabuli pomegranate is taken into account best in quality compared of different seed country. Patna pomegranate best is that the quality that has big seed.

TYPES OF ANAR ACCORDING TO TASTE:

- Sweet Anar,
- Sour Anar
- Combination of both sweet and sour^[6].

BOTANICAL DESCRIPTION:

Punica granatum may be a ligneous plant or little tree, 5-10 m high, thought-about to be native of Asian country, Afghanistan and Baluchistan, found growing wild within the heat valleys and outer hills of Himalayas mountain chain between 900 and 1,800 m, and cultivated throughout Republic of India^[7]. The bark is sleek, grey, thin, typically armed with little axillary or terminal thorns. Leaves are opposite, 2.5-6.3cm long, oblong- unsubdivided, rectangular- elliptic or oblong – simple, glabrous, entire, circumstantially pellucide-punctate, shining higher than, bright inexperienced to a lower place base narrowed into a awfully short stalk. Flowers are 3.8-5 cm long and the maximum amount across, largely solitary, someday 2-4 along, terminating short shoots, typically apparently axillary, sessile or nearly therefore. Calyx tube is campanulated, adnate to and made on the far side the ovary, coriaceous, lobes 5.7, valvate. Petals are 5-7, obovate, scarlet, wrinkled, and inserted between the calyxes. Stamens terribly various, inserted on the coil below the petals at various levels; anthers elliptic, dehiscing lengthwise. Ovary is inferior, many-celled, the cells organized in two concentric circles; style long, bent; stigma capitates. Pistil early coalescing and attributable to unequal growth changing into organized into two tiers, three within the lower and 5-9 within the higher. Fruit: 3.8-7.5 cm. diameter; globose, tipped with the calyx-limb, rind tough, woody, the inside body part with the membranous walls of the carpels, every pistil containing various seeds angular from mutual pressure. Seeds have a watery outer coat containing pink juice and an attractive inner coat^[4].

Pomegranate rind: Pomegranate rind is irregular, a lot of or less arched, hard, brittle, fragments, a number of that have protruding from than the hollow coil with the remains of the stamens and elegance basined. It's somewhat rough outwardly, and of xanthous or reddish- brown colour; internally it's yellowness or chromatic, and marked with depression left by the seeds. It marked odour; however a really astringent and feebly bitter tastes one hundred ten^[7].

Phytochemistry:^[8]

Biologically active principles isolated from different parts of the plant include:

Anthocynin and flavonoides: The rind and seeds contain glycosides of malvidine and petunidine and petargonidine 3, 5- diglucoside was found to be the main pigment of flowers. Leaf extracts have yielded

apegenin-4, O-β glucopyranosides, luteoline 4, O-β glucopyranoside, luteoline -3-O-β xylopyranoside and isoquerctine.

Alkaloids: Punicalin, punicalagine, granatine β, gallagylidilacene casuarine, pedunculagine and tellimagrandine¹ were isolated from the pericarp the fruits also contain punicalagine, punicaline and grantine B. The bark contains iso- pelletierine, pseudo- pelletierine, methyl iso-pelletierine and pelletierine.

Tannins: Gallic acid, granatine A, corilagine and ellagic acid have been isolated from the pericarp the fruit contains an ellagitanin and ellagic acid.

Triterpenes and phytosterole: Sitosterol, friedelin, ursolic acid, mastinic acid asiatic acid are present.

PHARMACOLOGICAL ACTIONS:

The plant has been described to have various pharmacological activities such as vermifuse, antiulcer, cordiotonic, aphrodisiac, amenogouage, nematicide, parasticide, appetizer, laxative, diuretic, digestive^[9], anodyne, astringent, bactericidal, stimulant, stomachic, styptic^[10], antispasmodic, antihelminthic, analgesic, abortifacient, amebicide anti aging, anti atherogenic, antifertility and anti tubercular^[11]. It has been traditionally used in conditions like abortion, anorexia, asthma, biliousness, dysmenorrhoea, dyspepsia, epistaxis, hemorrhoids, high cholesterol, fever, bronchitis, brain disease, chest problems, scabies and kidney disorder, haematuria, impotence, inflammation^[12], bleeding, burn, cholera^[13], cough, dermatosis, diabetes, diarrhea, dysentery^[14], infection, infertility, cough, cardiac problems, metrorrhagia, leucorrhoea and leprosy^[15].

Unani physician have mentioned various medicinal properties of Anar (*Punica granatum*) like Majaffif (Desiccant)^[16], Quabiz (Astringent)^[17], Muhallil (Antiinflammatory)^{[16],[18]}, Habisuddum (Haemostatic), Dafe kiram (Antihelminthic)^[17], Dafe ishal (Anti-Diarrhoeal)^[17], Dafe sailane haiz (Antimenorrhagia)^[17], Mane qai (Antiemetic) Mujalli (Detergent)^[19] Muqawwie maida (Stomachic)^[17], Muddire baol (Diuretic)^[17] Mulain shikam (Laxative), Musammine badan (Anabolic), Muqawwie Azae Raesa (Tonic for vital organs)^[17].

Medicinal uses:

Khaphquan (Palpitation), Yerquan (Jaundice)^[17], Azme-Tihal (Spleenomegaly), Sual (Cough)^[20], Dared seena (Chestpain)^[18], Zaheer (Dysentery), Ishal (Diarrhoea)^[17], Quroohe kohna, Bawaseer (Piles)^[21], Quba (Ring worm), Nafasuddam (Haemoptysis), Istisqua (Ascites), Kirme shikam (Vermifuge)^[17], Sailanur Reham (Leucorrhoea)^[21].

ADVANTAGES AND THERAPEUTIC USES OF VARIOUS ANAR PARTS

Bark: The dried bark of the stem and roots has long been used as an anthelmintic. The bark and fruit combined with other drugs are prescribed for the treatment of snake bite. The bark is also prescribed for scorpion bite. Stewing of the bark once taken orally followed by a purgative medicine acts as an anthelmintic. Stewing of root bark is used for tape worm. In India hot water extract of dried bark and fruit is taken orally for Hansen's disease, leucorrhoea and menorrhagia and as an anthelmintic.

Rind: Pomegranate peel/rind combined with opium and an aromatic, like cloves may be a useful drug in chronic diarrhea and dysentery. A decoction of peel is advised in abdominal ache and within the infectious disease whereas infusion of same material is taken for inflammatory bowel disease. Associate in nursing infusion of fine fruit, rind and rice flour is used in looseness of the bowels and dysenteries, as an anthelmintic. An infusion of the rind and root was used by the early colonist as an injection of leucorrhoea. In European nation hot

water extract of edible fruit peel is used for inflammation. In North American nation hot water extract of fruit peel is taken orally to prevent excessive hemorrhage throughout menstruation. In gulf edible fruit peel is used as a contraceptive in the form of pessary for birth control. In Asian nation poultice of fruits peel and genus *Tamarix gallicia* bark is applied double in twenty four hour to the breast to abate flabbiness water extract of edible fruit peel is taken orally for treating looseness of the bowels and infectious disease.

Flowers: fine flower powder used for respiratory disorder. Infusion of flower used as vermifuse. Stewing of flowers used as gargle for throat inflammation. Flower used as remedy for cut wounds, bronchitis, looseness of the bowels and system.

Leaves: stewing of tender leaves is used as gargle for buccal affliction. In Asian nation plight extract of leaves is taken orally for irregular menstruation. In Brazil plight extract of dried leaves is used outwardly for ladies issues. In African country leaves crushed in water are taken orally to expel tapeworm.

Roots: Dried root is employed as abortifacient. Three part *Allium cepa* seeds, three part of *Punica granatum*. Two part of *Cajanus cajan* and red lead oxide are taken with honey orally. In Republic of Peru plight extract of dried root are taken orally for abortion, as associate in nursing antidiarrhoeal and for bloody infectious disease.

Fruits: Hot water extract of dried fruit is employed outwardly for wounds, ulcer, bruise sore, mouth lesion, stomatitis, leucorrhoea and vaginitis. In African country extract of dried fruit is employed for skin lesion. In Asian nation extract of dried fruit is taken orally by pregnant ladies for kid birth disorder. In Asian nation fine immature fruit is taken orally for peptic ulcer. Olive oil extract of dried fruit is employed outwardly to forestall premature graying of hair. The mixture contains *Terminalia arjuna*, *Aglaia Roxburghiana*, *Jasminum officinalis*, *Indigofera tinctoria*, *Tinospora cordifolia*, *Pterocarpus marsopium*, *Eclipta alba*, *Pandanua tectorius*, *Oroxylum indicum*, *Valeriana harchivik*, *Terminalia chebula*, *Terminalia belerica*, *Embelica officinalis*, *Punica granatum*, and *Sesamum indicum*.

Whole plants: fresh entire plant created into a past is used for snake bite. The paste is applied to the bite site. Juice is dropped into the nostrils ears and navel^[22].

IMPORTANT UNANI FORMULATION OF ANAR:

- Broode Rumman
- Jawarish Anar Sada
- Jawarish Anar Murakkab
- Jawarische Anarain
- Habbe Anar
- Habbe Surpha
- Habbe Hindi
- Rummania
- Roghananar
- Safoof Anar
- Sikanjabeen Rumman
- Kushta Hindi
- Kushta Khubsul Hadeed
- Kushta Marjan^{[16][20]}.

SCIENTIFIC REPORTS

Hypoglycaemic Activity: Dhavan B *et al* reported the hypoglycaemic activity of Ethanol /water (1:1) extract of aerial parts, administered orally to rats at a dose of 250.0 mg /kg, was inactive. Less than 30% drop in blood sugar level was observed^[23].

Immunomodulatory Activity: A study was carried out to investigate the immunomodulatory activity of Anar by Ross G *et al* that aqueous suspension of fruit rind powder, administered orally to rabbits at a dose of 100 mg/kg, stimulated the cell-mediated and humoral components of the immune system. There was an increase in antibody titre to typhoid-H antigen.

Analgesic activity: A study was carried out to confirm the analgesic activity by Dhavan B. *et al* that Ethanol /water (1:1) extract of aerial parts, administered intraperitoneally to mice at a dose of 0.125 mg/kg, was active vs. tail pressure method^[23].

Anticonvulsant activity: Another study was carried out by Dhavan B. *et al* to found out the anticonvulsant activity in Anar that Ethanol/water extract (1:1) extract of aerial parts, administered intraperitoneally to mice at a dose of 0.125 mg/kg was inactive vs. electroshock-induced convulsions^[23].

Anthelmintic activity: Anti helminthic activity of *Punica granatum* was studied by Singhal KC, he reported that the chloroform extract of dried root and stem, administered to mice by gastric intubation at a dose of 250.0 mg/ kg for 3 days, was active on *Hymenolepis nana* and inactive on *Nippostrongylus brasiliense* and *syphacia obvelata*^[25].

Anti fertility activity: Gujraj M, Varma DR and Sareen KN. observed anti fertility effect in fruit peel, in the ration of guinea pig of both sex at a dose of 18.0 g/kg and in the ration of female rats, was active^[26].

Antifungal activity: Dhavan B. *et al* reported the antifungal activity of *Punica granatum* in Ethanol/water (1:1) extract of aerial parts, at a concentration greater than 25.0 mcg/ml on agar plate, was inactive on *Microsporium canis*, *Tricophyton menta grophytes*, and *Aspergillus nigar*^[23].

Anesini C. and Perez., also revealed that hot water extraction dried entire plant at a concentration 62.02 mg/ ml on agar plate was active on *Aspergillus niger*^[27].

Anti diabetic effect: A study was carried out to investigate the anti diabetic effect in flowers by Jafri MA. *et al*. They revealed that ethanol extract of the male abortive flowers, administered orally to normal glucose fed hyperglycaemic, and alloxan induced diabetic rats, produced significant blood glucose lowering effect^[28].

Anti inflammatory activity: A study was carried out to confirm the anti inflammatory activity by Mascolo N *et al*. The results of study revealed that ethanol (80%) extract of dried fruit peel, administered by gastric intubation to male rats at a dose of 100.0 mg/ kg, produced weak activity vs. carrageenin-induced pedal oedema. twenty three percent inhibition of oedema was observed^[29].

Gastro protective activity: A study was carried out by Gharzouli K *et al* that aqueous extract of the fruit peel was experimented in the animal model against ethanol induced damage thea rat against. The extract produced 100% precipitation of ovine haemoglobin in vitro. Oral administration induced significant decrease in gastric lesion. The protection was more significant when the test drug was given at the same time^[30].

Uterine stimulant effect: A study was carried out by Dhawan BN & Sexena PN that water extract of fruit peel was active on the uterus of non pregnant rats^[31].

Cytotoxic activity: Sato A reported that the *Punica granatum* have cytotoxic potential. He concluded that the hot water extract of fruit peel, at a dose of 120.0 mcg/ml in cell culture, was active on CA-JTC-26. The inhibition rate was 59%^[32].

CONCLUSION

For an extended amount of your time, the pomegranate plant are used as a natural supply of drugs, and also the use of plant elements for pharmaceutical purpose has bit by bit accumulated within the world over. According to the UN agency this medicative plant is that the best supply to get style of medication. Concerning eightieth of people from developed countries use them ancient medication. Pomegranate juice and extract are used extensively within the people medication of ancient cultures for varied medicative properties. Pomegranate has been shown to possess phytochemicals which can hold medicine properties. The natural object or the compounds derived from the plants are currently established formula of each prescribed drugs and nutraceuticals. This review aims to spotlight the medicative importance of the plant and journey of this people medication to trendy medication.

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CONFLICTS OF INTEREST

None declared.

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