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Tanmay Joshi

Medical Chemistry
Department, State Medical
Institute, Bhukhara,
Uzbekistan

Umurbek Gapurov

Medical Chemistry
Department, State Medical
Institute, Bhukhara,
Uzbekistan

Safarova Nafisa

Medical Chemistry
Department, State Medical
Institute, Bhukhara,
Uzbekistan

Bahromov Kashan

Medical Chemistry
Department, State Medical
Institute, Bhukhara,
Uzbekistan

Niyazov Laziz

Medical Chemistry
Department, State Medical
Institute, Bhukhara,
Uzbekistan

Rashmi Atul Joshi

Patanjali Research
Foundation, Haridwar,
Uttarakhand, India

Corresponding Author:**Rashmi Atul Joshi**

Patanjali Research
Foundation, Haridwar,
Uttarakhand, India

Pseudofruit of *Rosa* species (Rose hip): Medicinally acclaimed in Central Asian and ayurveda medicinal system

**Tanmay Joshi, Umurbek Gapurov, Safarova Nafisa, Bahromov Kashan,
Niyazov Laziz and Rashmi Atul Joshi**

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Abstract

The use of rose (*Rosa* species) is clearly mentioned in Ayurvedic and Unani medicinal systems of India. Generally, the petals are used in various forms for medicinal purposes. The use of rosehip i.e., pseudo fruit of rose is not very much acclaimed in India, except for its oil used cosmetically by some industries. However, in Central Asian countries like Uzbekistan the rose hip is widely used for its medicinal benefits in the form of herbal tea. The rosehips are rich source of phytoconstituents acclaimed for their therapeutic potentials. The various other culinary preparations are also made in several other countries also. The present paper aims to highlight the therapeutic and medicinal uses of rosehip as well as its Ayurvedic attributes for maintaining good health of body. The study also is aimed to understand the concepts of Central Asian medicinal system as somehow accumulated under the flagship of AYUSH as Unani Medicinal system.

Keywords: Rosehip, shathapathrii, medicinal uses, herbal tea

1. Introduction

India is a land of diversity exhibiting cultural and traditional variations with integrity. The medicinal field is also not apart from this diversity. The traditional medicinal systems of India are mainly Ayurveda, Unani, Siddha, Homeopathy, Yoga and Naturopathy however these are also practiced in other Asian countries with few exceptions. The description of *Rosa* (Rose) species is found in many ancient texts from India, Central Asia, and Europe [1]. In India, Ayurveda is considered to be fifth Veda describing the science of wellbeing through *Aaahara –Vihara* concept to remain healthy and disease free. The description of rose has been found in Bhavyaprakash Nighantu as “*shathapathrii tharunyuktha karnika charukeshara – mahakumari gandaadya laakshapushpo athimanjula shataparnii hima hrdaya.....*” describing its *guna* (Attributes) potency, nature as *shathapathrii* and *tharunyuktha*, *karnika*, *charukeshara*, *atimanjula* as are the synonyms for its cold potency, light in nature, enhance semen and good for heart and managing blood disorders [2] (Figure 1). Not only in India but all across the globe the people since ancient times were depended largely on herbal medicines for the treatment of various ailments. Abu Ali Ibn Sina or Avicenna (AD 980-1037) ‘The Father of Modern Medicine’ was born in village Afshana near Bhukhara and was the most prominent scholar and physician of his time. His one of the most famous book on medicine “Al-Qanoon fit-Tibb” (The Canon of Medicine), in which the use of rose for the treatment of headache and some neural and gastrointestinal diseases, ulcers, including mouth ulcers and strengthening of the gums [3,4] is given. In India it was Abdul Hameed (AD 1908-1999), a renowned Indian Hakim (medicinal practitioner) did English translation and annotation of Ibn Sina’s Al-Qanoon fit-Tibb and developed some modern clinical protocols, and some highly effective drugs to treat liver disorders, hypertension, cholesterol deposition, and renal dysfunction. Rooh Afza, a relaxing and energizing beverage prepared from rose petals is now popular globally [5,6]. Similarly, the use of *Rosa canina* (*Nastaran* or *Nasrin* in Persian) has a long history of use in traditional Persian medicine. Hippocrates used rosehip for treatment of diseases of gallbladder. Dioscorides also used it for abdominal pain. The petals juice was used as a fixative and hemostatic agent [7, 8]. It was Pliny the elder (23-78AD) who observed that the French ethnic group used the *Rosa* for the treatment of dog bite and then described the healing properties of it and gave ‘dog rose’ name to it [9]. According to fossil remains, it is assumed that roses are 35 million years old and fruits of various species of wild rose were used for food in the late

Neolithic Age, the Iron Age, the Ancient World and the Middle Ages^[10]. The earliest known cultivation known to date back at least 500 BC in Mediterranean countries and since ages the roses are grown all across globe for their beauty, fragrance. Today there are more than 350 species of *Rosa* genus^[11] and thousands of cultivars varying in flower color, shape, size well as chemical composition. These are favored subjects in art and appeared on illustrations, portraits, ornaments, architectural elements in various civilizations. Globally today this genus is cultivated for the ornate flowers, where the bulbous fruits (hypanthium/haw) located below the petal corolla, known as rose hips are collected for the preparation of few herbal products like tea.

During world war II the tea prepared from it was chiefly used to cure many diseases and considered to be rich source of vitamin C^[12].

1.1 Scientific Classification

Kingdom: Plantae

Division: Magnoliophyte

Class: *Magnoliopsida*

Order: *Rosales*

Family: *Rosaceae*

Subfamily: *Rosoideae*

Genus: *Rosa*

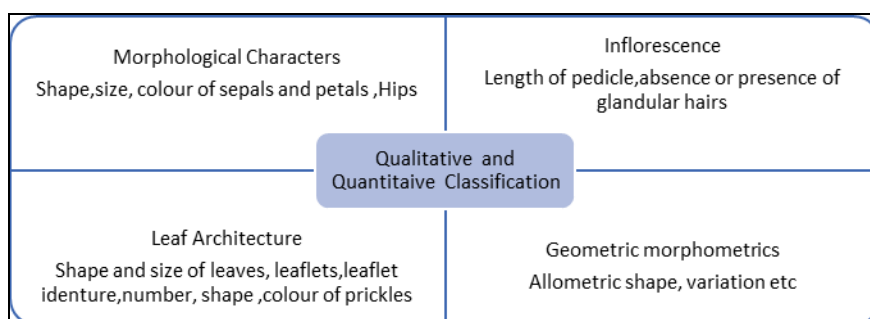


Fig 1: Qualitative and Quantitative classification of *Rosa* species

1.2 Heterotypic Synonyms

Bakeria (Grand.) Grand.; *Chabertia* (Grand.) Grand.; *Chavinia* (Grand.) Grand.; *Coettetia* (Grand.) Grand.; *Crepinia* (Grand.) Grand.; *Ernestella* Germ.; *Hesperhodos* Cockerell; *Hulthemia* Dumort; *X Hulthemosa* Juz.; *Juzepczukia* Chrshan ; *Laggeria* (Grand.) Grand.; *Loweia* Lindl.; *Orzanonia* (Grand.) Grand.; *Platyrrhodon* Decne.ex.Hurst.; *Pugetia* (Grand.) Grand.; *Rhodophora* Neck.; *Rhodopsis* (Endl.) Rchb.; *Ripartia* (Grand.) Grand.; *Saintpierreia* Germ. *Scheutzia* (Grand.) Grand^[11].

1.3 Botanical Description

Shrubs, erect or climbing. Stems and branches usually with prickles and /or thorns. Leaves impar pinnate; leaflets serrate. Stipules forming a sheath with free auricles. Flowers bisexual, solitary or in corymbs. Sepals 5, or the 3-outer lobed. Petals 5. Stamens, carpels and styles many; ovule 1 per carpel. Receptacle hollow, becoming fleshy and colored and containing numerous achenes. Styles free or united protruding through the opening of the receptacle^[11].

1.4 Distribution

Rosa genus contains 350 species, classified on numerous basis (Figure 1). These are mainly distributed in the Northern Hemisphere, mainly in temperate areas. It is native to almost every part of world however introduced into Argentina Northeast, Argentina South, Bangladesh, Bolivia, Cape Provinces, Caroline Is., Chatham Is., Chile Central, Chile South, Comoros, Cook Is., Falkland Is., Free State, Gilbert Is., Guatemala, Gulf of Guinea Is., Honduras, KwaZulu-Natal, Lesotho, Libya, Madagascar, Marianas, Mexico Central, Mexico Gulf, Mexico Southwest, New South Wales, New Zealand North, New Zealand South, Northern Provinces, Queensland, South Australia, Tasmania, Trinidad-Tobago, Vanuatu, Victoria, Western Australia^[11].

2. Traditional Medicinal Uses of *Rosa* in other countries

In the ancient medicine the attribute of *Rosa* is defined as

hot and dry in the second degree and thus helpful in opening the blockage in the internal organs and cleans them well. The fragrant smell of it is helpful in strengthening of brain, heart, brain, sense organs^[15]. In Mongolian traditional medicine, it is used in the treatment of burning skin, headache and dizziness. In Russian traditional medicine, *Rosa* tincture on vodka (1:10) is used for the treatment of diarrhea. A liqueur is prepared using 1:1.5:3 ratio of fruit: sugar:vodka kept in sun for five days and is drunk 15-30 g after meals as an anticonvulsant, painkiller.^[15] In Chinese traditional medicine, the roots are used as an antihelminthic. In Bulgarian folk medicine, fruits, flowers are used as a sedative and choleric.^[17]

Roots: The roots have been used to treat dysuria, hemorrhoids, cough. The boiled roots are drunk as a strong diuretic for urolithiasis.^[18]

Branches: The boiled branches and leaves are used for dysentery and stomach pain. The branches are also useful in the treatment of urolithiasis.^[18] The branches are burned, and a resinous substance is obtained used to cure psoriasis^[19].

Leaves: The leaves are used in the treatment of flu, cough colds^[19].

Flowers: The local population of Central Asia prepares preserves of wild rose petals and use it as a heart booster and a sedative^[20]. In Tibetan traditional medicine, flowers are used for treatment of tuberculosis, neurasthenia and atherosclerosis^[17]. Jam of its petals relaxes and helps to heal the heartbeat. It is also useful for tumors of the throat and tonsils. The petals juice is taken with honey, act as a diaphoretic and remedy for colds, hypertension and liver diseases. Rose petals are used to flavor tea or combined with others to prepare herbal tea and also used to prepare sweet preserve called as gulkhand in Indian subcontinent.

Fruits: The boiled fruits are used as a choleric and fortifying agent. These are also used to treat common cold, asthma and bronchitis. The rose hip is rich source of vitamin C and are also used for making jam, jellies, soup and even used as herbal tea. The petals eliminate the unpleasant smell of sweat in the bath^[18].

Seeds: Seeds have been used to treat gout, osteoarthritis and rheumatism. The grinded seeds with alum, are used for treatment of external wounds^[18].

Rose oil: The oils prepared from the rosehips have choleric and wound-healing effects. The rose oil is used to make perfume also known as attar of rose. The oil is rich in beta damascenone, geraniol and L –citronellol and rose camphor, an odorless solid composed of alkanes which separates from rose oil^[21].

Rose water: The rose water is prepared by steam distillation of rose petals and used in cosmetics, cooking, and medicine and in various religious practices.

2.1 Ayurvedic Names of Rosa

Shatapatri – having many petals; *Karnika* –having big petals like ears; *Laksha*-red coloured like laksha; *Gandhadya*

–having good fragrance; *Charukesara*-having good looking petals; *Kantakapravrutta* –having thorns; *Dheera*, *Taruni* etc^[2].

2.3 Classical Categorization of Rosa

In various *nighantu* the *Rosa* has been classified.^[2] In *Bhavaprakasha nighantu* it is considered as *pushpavarga*, in *Dhanvantari nighantu* like *amradivarga*, in *Kaiyyadeva nighantu* as *oushadhivarga* and in *Raja nighantu* considered as *karaveerativarga*.

2.4 Ayurvedic Attributes

Guna(properties)-*Laghu*(light), *Snigdha*-(slimy)

Rasa(taste)-*Tikta*(bitter), *Kashaya*(astringent),

Madhura(sweet)

Vipaka-Madhura (sweet after digestion)

Veerya(potency) -*Sita* (cold).

It helps to balance all *tridosha*, strengthens the heart, helps in increasing the potency as well as digestion (Figure 2). Besides these it is also indicated in *mukhapakagni*(mouth ulcers), *trushna*(excessive thirst), *chardi*(vomiting). The recommended dosage is powder-3-6 g, use of distillate vary according to necessity and distillate from flower is consumed approximately 20-30 ml. However, variations can be there as per requirement^[2].

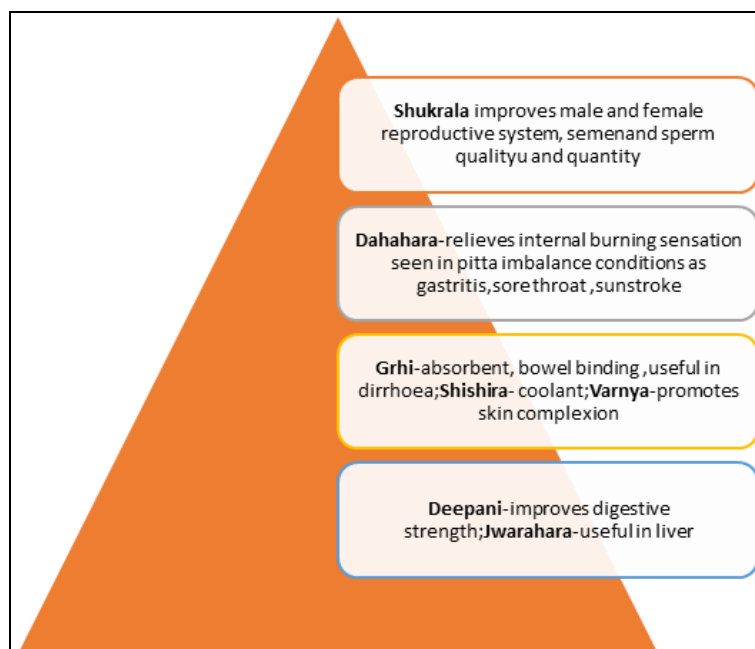


Fig 2: Ayurvedic Medicinal Uses of Rosa

2.5 Ayurvedic Uses of Rosa^[2, 22]

Rosa species are also widely used in ancient Indian medicinal system Ayurveda, and are commonly known by name '*Saptaparni* or *Shatapatri*' i.e., plant with hundred petals. It is regarded as cooling herb which balances *vata*, *pitta* and *kapha* thereby proving a wide range of health benefits^[22].

Rose petal extract: Used as drops or eye wash in the burning sensation of eyes; infusion as gargle for sore throats, used as herbal tea to treat acidity, burning sensation in body dryness of oral cavity and effective in infection of intestine.

Dried paste of rose petals: Taken internally 5 g along with milk to treat gastritis and duodenal ulcers.

Rose bud decoction (20-30 ml) in divided in doses is used to treat constipation.

Rose hip tincture as astringent in diarrhea or in relieving colic or as component in cough remedies; dried rose hip used to prevent scurvy.

Essential oil of rose in creams for dry inflamed skins, in aromatherapy for insomnia, blood pressure, cosmetic industry as ingredient of soap, body wash, perfume body spray etc.

Rose formulations in Ayurveda^[2,22]

Mukta pishti: medicine prepared from pearl and rose water, used to treat diarrhea with bleeding mania and psychosis.

Pravala pishti: medicine prepared from coral and rose water, used for treatment of cold, cough, pitta related disease.

Manikya pishti: Medicine prepared from ruby and rose water, used to treat oligospermia, and as immunity booster.

Gulkand: rose petal paste with sugar, consumed 10-15 g with milk to treat gastric ulcer, burning sensation, and other *pitta dosha* predominant disease.

Gulab arka: distillate manufacture of rose petals used to treat burning sensation of eyes, remove bad odor of body [2,22].

3. Rose hip fruit characteristics

Rose hip is considered as pseudo fruit which is peeled from sepals and peduncles and possess various shapes from oval to spherical to highly elongated spindle-shaped appearing to be 0.7 - 3 x, 0.6 - 1.7 mm (length x diameter). In species of *Cinnamomeae* section at the top of the fruit there is a small round hole however in species of *Canina* section there is a pentagonal platform. The overgrown fruits are orange-red to brownish-red fleshy, without smell, with juicy receptacle and numerous fruit nuts usually light yellow, sometimes brownish enclosed in its cavity. These nuts are oblong small with weakly expressed edges. The outer surface of the fruit is shiny, less often matte, more or less wrinkled. Inside, the fruit is covered with long, bristly hairs [13]. The taste is sour-sweet, slightly astringent [14]. According to the Ayurvedic understanding rosehip is sour and astringent possessing more warming action, used to reduce excess *vata* and raise the qualities of *kapha* and *pitta* [2].

3.1 Rose hip Herbal Tea Preparation in Uzbekistan

Herbal tea or commonly known as Green tea is derived solely and exclusively and produced by acceptable process notably by rolling, or comminution, drying, enzyme inactivation from the leaves, buds and tender stems of varieties of any plant species. The plant part officinal in European pharmacopeia consider rosehip without fruits as a herbal drug. In Uzbekistan rose hip tea is widely consumed as herbal tea as well as also taken for medicinal usages mainly for its high vitamin C content. The preparation of herbal tea is usually done with dried rosehip and then crushed it to fine powder, however there are differences in the preparation of high and low vitamin species. The harvesting season of the varieties is different depending on the species. The types with high vitamin content are harvested in August-September and harvesting of fruits should be completed before frost, since after frost during thawing, the content of ascorbic acid in the raw material is reduced. The fresh material can only be stored upto three days. The drying of fruit material is done by using dryers by exposing fruits at 80- 90 ° C as at this temperature the fruit dries quickly without significant loss of ascorbic acid. [23] The herbal powder is added to hot water to prepare tea and thus the nutrients found in tea composition are diluted as it contains much water.

3.2 Traditional Uses of Rose hip in various Cuisines

Rose hips have been used for the preparation of various cuisines all across the globe. Some are locally prepared and made available in households while some are commercially prepared for the distribution within the region. Usually the

rose petals are more commonly used for preparation of jam, jelly, dessert, sherbat etc., but the rosehip preparations are also widely acknowledged both for culinary and medicinal purposes (Table 1).

Table 1: Some common preparations of rosehip in few countries

<i>Nyponsoppa</i> rose hip soup	Swedish cuisine
<i>Hagebuttem</i> , Rose hip soup	German cuisine
<i>Dzika Róża Zachowaniais</i> Rose hip preserve	Polish cuisine
Palinka –brandy, Brandy	Hungarian cuisine
Tea	Britan, Turkey, Iran, Uzbekistan
Jelly and wine	Samish Indians of Washington state

3.3 Rose hip as Functional food

According to the definition of functional foods rose hips can be considered as functional food ingredient if it meets certain perquisites required as mentioned by the food regulations, however they are not precisely fixed and can be varying according to the country for use. The quantity of rose hips in recipes needs to be substantial enough to provide health benefits, and that particular rose hip species must contain certain amounts of active phytoconstituents as vitamin C, lycopene which are known for their beneficial effects when studied for different fruits and vegetables. Today, a great deal of attention is paid to the development of the pharmaceutical industry and the expansion of the produced on medicinal plant raw materials. Biologically active substances (vitamins, micronutrients, and antibiotics) prepared on the basis of plant fruit raw materials are valuable medicinal components that prolong the average life expectancy and ensure the ability to work, and have a wide range of opportunities to improve human health. Rosehip is a valuable multivitamin plant, the fruits of which are a raw material for the pharmaceutical industry. The fruit of rosehip is called a concentrate of natural vitamins, because the fruit contains a large amount of vitamin C (up to 6%) and vitamins B1, B2, P1, and E [24,25]. Medicinal products such as rosehip fruit and its extract, rosehip juice, and rosehip balm have pharmacological activity and are effective in the treatment of anemia, psoriasis, hemophilia, and atherosclerosis [26,27].



Fig 1: Rose specie



Fig 2: Rose shop (Pseudo fruit)

4. Conclusion

Since ancient times mankind has used various plants around him for edible, medicinal and other purposes. India is a land of diversity and has imbibed various other cultural and traditional systems including medicinal system also. The Unani medicinal system is traditional medicinal system of Greco Arab origin and received patronage from Delhi Sultans and Mughal emperors in India (13 -18th century). Later on, its advancement began under banner of Indian system of medicine. [28] *Rosa damascene* (Gul Surkh) is listed medicinal plant of Unani medicine used for the treatment of hepatitis, pericarditis and palpitation [29]. The use of rose plant had been mentioned for edible and medicinal purposes all over the world. In Ayurveda mainly rose petals are used medicinally whether in extract form, infusion, paste etc. The use of rose hip is scantily found in Ayurveda, although nowadays is consumed widely in the form of tea and also for its essential oil. The rose hip is reported to be store house of many important phytochemicals responsible for curing many diseases in the body. There is urgent need to explore the potential of rose hip so that it can be included more in daily diet as the principle of Ayurveda clearly relies on *Aahara vihara* to remain healthy and disease free.

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6. Authors Contribution

Niyazov Laziz (NL) took the task of study conception and design of paper. Bahromov Khasan (BK) provided necessary data ;Safarova Nafisa (SN) and Umurbek Gapurov (UG) drafted manuscript preparation and Tanmay Joshi (TJ) drafted the Ayurvedic concepts for *Rosa* and rosehip. Rashmi Atul Joshi (RAJ) edited the manuscript. The authors confirm contribution to the paper, and reviewed the manuscript and approved the final version of it.

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