



## *Prunus Armeniaca* (Apricot): An Overview

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### ABSTRACT

*Prunus armeniaca* (Apricot or khubbani) belonging to family *Rosaceae* is an important edible medicinal plant which is grown in Central Asia, Pakistan, Turkey, Iran, Iraq, Afghanistan, Pakistan, and Syria. The plant is reported to contain polysaccharides, polyphenol, fatty acid, sterol derivatives carotenoids, cynogenic glycosides and volatile component. The literature reveals its various activities such as antimicrobial, antimutagenic, cardio protective, anti-inflammatory, antinociceptive and antioxidant. In very small amounts, the hydrogen cyanide present in apricot kernels has been traditionally prescribed in Chinese medicine for treating asthma, cough, and constipation. The present review highlights its various chemical constituents and pharmacological activities.

**Key words:** *Prunus*, phytochemical, traditional, pharmacological.

### INTRODUCTION

The use of natural remedies for the treatment of various diseases has a long history, starting with the Ayurvedic treatment and extending to the Chinese, European and other systems of traditional medicines<sup>1-2</sup>. India, rightly called the "Botanical Garden of the World" is the producer of many medicinal plants which play very important role in health and vitality of human beings as well as animals. As per WHO estimates, 80% of the world's population currently use herbs and other traditional medicines to cure various diseases due to less side effects and low cost<sup>3</sup>. This review dealt with the traditional and pharmacological account of an important and interesting plant *Prunus armeniaca* commonly known as Apricot (Latin meaning "precocious" or "early ripening") or khubbani belonging to family *Rosaceae*, Subfamily *Rosidae* and Order *Rosales*. The plant is known in different languages by different names like Urumana, Zardalu (Sanskrit), Malhoi (Assamese), Khubani fal ( Bengali), Jardalu (Gujarati), Khubani, Zardalu (Hindi), Apricot ( Kannada), Jardaloo(Marathi), Apricot ( Malayalam), Khubani badam (Oriya), Apricot (Tamil), Apricot pandlu (Telugu), Khurmani ( Punjabi), Khubaani ( Urdu). In Eastern countries, the Apricot is known as "moon of the faithful" and the ancient Persians referred it as "Egg of the sun"<sup>4</sup>.

### Distribution

Apricot (*Prunus armeniaca* L.) is a deciduous plant of continental region with cold winters which can tolerate temperature as low as -30°C. It is mostly grown in the Mediterranean countries, Central Asia, Russia, USA, Iran, Iraq, Afganistan, Pakistan, Syria and Turkey. United States produces almost 90% of the world's apricot crop<sup>5-6</sup>. In India it is mainly cultivated in North West Hills Region, Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh and also in North Eastern Hills Region comprising the state of Arunachal Pradesh, Nagaland, Meghalaya, Sikkim and Manipur. Varieties of Apricot locally found in India are 'Halman and Rakchaikarpo' which are reported in Leh -Laddakh area of J & K state<sup>7</sup>.

### Botanical Description

Apricots are the deciduous plant which grows up to 9 m height<sup>8</sup>. The leaves are oval and finely serrated with 5-petaled white flowers growing together in clusters. The fruit's color varies from yellow to orange to deep purple and ripens in late summer.

### Ecology

The plant is best grown in deciduous climatic condition with low temperature<sup>9</sup>. It is usually grown under rain fed conditions and being a hard plant and tolerant to dry atmosphere, no additional irrigation is required<sup>10</sup>. It requires well drained alkaline and saline soil for the best cultivation. These are not generally fertilized chemically. Only the well rotten farm yard manure is applied to the trees. Pre-leaf-fall spray of 2.5-5.0 per cent urea and 0.1 percent boric acid spray after petal fall improve the flowering and fruiting of the tree. It is mostly propagated through seeds and rarely by vegetative method such as grafting and budding. The multiplication through cuttings is also rarely done. Apricot fruits generally start maturing from last week of May and continue up to August end depending upon altitude and location. They are harvested manually by shaking the tree branches and no mechanical harvesting is practiced. The fruits should be harvested in morning hours and direct exposure of fruits to sun should be avoided during grading and packaging<sup>11</sup>.

### Chemical Composition

The plant is found to be rich source of carbohydrates (both mono and polysaccharides)<sup>12</sup>, polyphenols<sup>13-14</sup>, caretenoids ( $\beta$ -carotene)<sup>15</sup>, vitamins C and K, thiamine, niacin, iron, organic acids, phenols, and volatile compounds viz. benzaldehyde, esters, norisoprenoids, and terpenoids<sup>16-17</sup>. The kernels are reported to contain the cyanogenic glycoside amygdalin (vitamin B17) due to which if eaten they are hydrolyzed by enzyme  $\beta$ -glucuronidase in alkaline environment of small intestine into glucose, benzaldehyde, and hydrocyanic acid and with emulsification, it's absorbed quickly and circulates in the body and thus can be responsible for its toxic effects.<sup>18</sup> This is more common in children due to children's lower body mass and thus children's high gastric acidity than that of adults. Ripe fruit pulp contains total solids (12.4 - 16.7%), insoluble solids (2.1 - 3.1%), acids as malic acid (0.7-2.2%), total sugar as invert sugar (5.3-8.6%), glucose (3.2-4.8%), fructose (1.4-4.25%), sucrose (1.4-5.4%) and tannins (0.06-0.10%)<sup>19</sup>.

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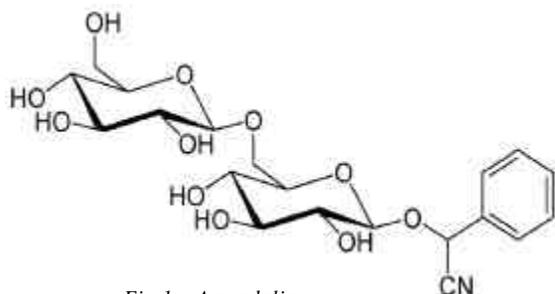


Fig.1. Amygdalin

### Contraindications

Consumption of apricot kernels or Laetrile™ (an alternative cancer drug marketed in Mexico and other countries outside of the United States, derived from amygdalin)<sup>20- 21</sup> is not recommended in pregnant or breast-feeding women because of potential risk of birth defects<sup>22</sup>. Infants born to mothers exposed to cyanide and thiocyanate during pregnancy have exhibited thyroid disease<sup>23</sup>. Apricot kernels may also cause decrease in blood pressure, and therefore may interact with blood pressure lowering herbs and supplements. Urticaria and rashes have also been reported.

### Adulterants

Apricot oil is widely adulterated with almond oil which can be detected by determination of tochoferol by mainly three methods viz biber test, gas chromatography and colorimetry<sup>24</sup>.

### Traditional Uses

The apricot has been used in folk medicine as a remedy for various diseases<sup>25</sup>. Bark is used as an astringent to soothe irritated skin. Kernel paste is used to heal vaginal infections and its oil is used in cosmetics to protect the skin from UV radiation and as a pharmaceutical agent (laxative and expectorant). Apricots are delicious when eaten fresh or can be used - in desserts, poached, stewed or pureed in jams, chutneys, pickles, compotes, salads or sorbets. They are lovely accompaniments to meats and poultry. Strained baby foods from pulp of apricot are nutritious and a good source of calcium, phosphorus and iron. The oil of seed is edible and oil cake can be used as organic manure. It is also reported to be use in asthma, constipation and cough<sup>26</sup>.

### Pharmacological Reports

#### Antimicrobial Activity

Both bitter and sweet kernel of *Prunus armeniaca* L showed antibacterial activity against Gram-positive bacteria *Staphylococcus aureus* and Gram-negative bacteria *Escherichia coli* and antifungal activity against *Candida albicans* and *Candida glabrata*<sup>28</sup>. The fruits showed maximum inhibitory activity against *Micrococcus luteus*<sup>31</sup> however no antimicrobial activity has been reported from essential oil of apricots<sup>29</sup>.

#### Antioxidant Activity

Most of phenolic compounds (determined by measuring absorbance of the extract solutions after incubating them with Folin-Ciocalteu reagent) occurring in fruits exhibit antioxidant activity<sup>30- 31</sup>. Both methanolic and water extracts of sweet kernels showed good antioxidant activity while bitter kernel extracts showed negligible antioxidant activity. The highest phenolic content ( $7.9 \pm 0.2 \mu\text{g/mL}$ ) and lowest phenolic content ( $0.4 \pm 0.1 \mu\text{g/mL}$ ) was detected in the water extract of a sweet apricot and bitter apricot kernel respectively<sup>8</sup>. The methanolic extract of leaf also show good antioxidant activity when determined by enzyme analysis, pigment analysis and protein extraction parameters<sup>32</sup>.

#### Anticancer Activity

Due to presence of cyanogenic glycosides (mainly amygdalin) in seeds it is reported to be used as a medicament for the treatment of cancer<sup>33</sup>. Laetrile, a purported alternative treatment for cancer has also been extracted from apricot seeds. In England, apricot oil is in use against tumours, swellings, and ulcers even from the seventeenth century<sup>34</sup>. It has been also revealed by scientists in the Republic of Korea (2005) that treating human prostate cancer cells with amygdalin induces programmed cell death and it was concluded by Chang et al (2006) that amygdalin offer a valuable option for the treatment of prostate cancers<sup>35</sup>.

#### Hepatoprotective Activity

Rahman et al (2011) reported hepatoprotective activity of fruits in dimethylnitrosamine induced hepatotoxic rats<sup>36-37</sup>.

#### Other Activities

*Prunus armeniaca* also show antitubercular<sup>38-39</sup>, antimutagenic, cardio protective, anti-inflammatory and antinociceptive activity<sup>40</sup>.

#### Marketed Products

Due to its various uses reported, many products containing apricot are formulated like The Himalaya Apricot scrub, Himalaya Apricot cleansing milk, Apricot facial cream, Apricot candy, Apricot jam, Apricot gentle exfoliating daily face wash, Almond- Apricot massage cream, Bioapricot Gel, Kadi apricot oil etc.

### CONCLUSION

*Prunus armeniaca* is one of the universal deciduous plant having medicinal activities. This versatile ancient plant is reliable source of medicine so used in many pharmacological activities like anti cancer, anti-oxidant, anti-microbial and also to treat skin infections, CNS dysfunction, and genito-urinary infections. So as now the global scenario is changing towards the use of nontoxic plant product, the development of modern drug from *Prunus armeniaca* should be emphasized for the control of various diseases.

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