Journal of Pharmaceutical and Biological Sciences
ISSN: 2320-1924; CODEN: JPBSEV

Available online at: http://www.jpabs.org/
Review Article

Economic and Ethno-Medicinal Uses of *Prunus armeniaca* L. in Trans-Himalayan Zone of Ladakh

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Received: 04-12-2016 / Revised Accepted: 23-12-2016 / Published: 01-01-2017

ABSTRACT

From the last few years the trend in healthcare has seen a sea change. More and more people are now opting for traditional system of medicine. In the allopathic system of medicine as well there is an increasing dependence on natural resources which are under huge exploitation pressure. Collecting traditional knowledge on use of various plants for treating different diseases and knowing their other economic uses is the need of the hour. The documentation of local uses of the plants is also very important to reduce the poverty and to improve the economic conditions of the people living in far-flung areas. Therefore we assessed ethano-medicinal uses and economic importance of *Prunus armenica* L. in Ladakh region of the State of Jammu and Kashmir where this fruit is cultivated on a very large scale.

Key words: apricot, ethano-medicine, economic condition, trans-Himalaya

INTRODUCTION

Prunus armeniaca L. commonly known as apricot, belonging to family Rosaceae [1], is cultivated world over including in the countries like China, Iran, India, Korea North Africa, Turkey the US etc. [2]. It is believed to have originated, and first domesticated and cultivated in China around 2000 BC. Total apricot production of the world is 2.6 million tonnes, Turkey being the major producer. While the ancient Persians called apricot "Egg of the sun", in Eastern countries, the apricot is known as "moon of the faithful" [3, 4].

Apricot is cultivated through the length and breadth of the Ladakh region of Jammu and Kashmir State. Plants are deciduous and can withstand temperatures as low as -30 °C. Apricot is grown under rain fed conditions and usually without any additional irrigation [5]. Well-drained alkaline loam and saline soils are the best for apricot cultivation; these soils usually don't require chemical fertilization for cultivation of this prized fruit [4]. The trees are 9 m high [6], with serrate leaves ovate in shape; the flowers are typical rosaceous, clustered, white in color. Plants bloom in the month of April-May and the fruits ripen in July-August. Fruits are yellow to orange in colour and may have a reddish tinge. The plants are propagated by seeds, cuttings and grafting. The time to maturity i.e. the period from juvenility to first flowering is 6-7 years. The trees are drought-resistant and usually long-lived with an average age of 50-60 years with some trees living upto100 years or longer under favourable conditions. The trees don't require any particular pesticide spray, moderate temperature, adequate sunlight and water are sufficient for proper cultivation.

The State of Jammu and Kashmir is home to several ethnic groups each with its own stock of traditional knowledge that has been propagated from one generation to the next through the word of mouth [7]. This valuable knowledge requires to be documented immediately in order to prevent its loss. Up till now, no study has been carried out to document the economic significance and ethno-medicinal uses of apricot from Ladakh region because of its inaccessibility on account of inclement weather and, remote and difficult terrain. It is in this backdrop the present study was carried out to document the economic and ethno-medicinal

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uses of this prized plant species from the Trans-Himalayan region.

MATERIALS AND METHODS

The compilation of the knowledge consolidated in the present work regarding ethano-medicinal uses of apricot, and various parts of this tree thereof, is based on the extensive field surveys of the authors and their interaction with the local population of the area. During present work surveys were conducted in most of the areas where apricot is cultivated in the Kargil district and all the information collected was properly noted down and important traditional uses of the fruit and various parts of the tree were recorded. Information was collected by means of direct interviews of the people and by questionnaire method. People, however, responded more to the direct interview than the questionnaire method of the collection of information.

RESULTS

Local Distribution: Apricot is locally known as "Chuli". It is cultivated in almost all major villages of Kargil which include: Kharboo, Chiktan, Silmo, Gargado Garkon, Chanigund, Kartik Badgam, Hardrass, Chulichan, Shilikhey, Kargil Town, Akchaamal, Batalik, Sanjak, Darchik, etc. Many other villages including, Saliskot, Trespone, Minji, Tambis, Kanoor, etc. also cultivate apricots but at a smaller scale. Hardras, Batalik, Silmo, Gargado, Darchiks, Garkon, Chulichan and Karkitcho are famous for apricot cultivation and apricots from some of these villages including Hardras, Darchik, Garkon and Batalik are very popular. In District Leh the plant is cultivated in Dah, Hanu-Thang, Saspol, Skrbuchan and Turtuk in the Nubra valley.

Varieties available: Many varieties of apricot are grown in Ladakh, notable among them are, Halman, Khanta, Khanpuck, Khosta, Phating, Stonchuli, Rakchaikarpo and Ngarmo. Halman chuli which is the sweetest variety is the most costly one also; its kernels also are very sweet.

Economic and ethano-medicinal uses

Commercial value: Apricot is the main source of income for the local populace roughly 30% of the population is actively associated with its cultivation. The work force includes men women and children. Watering, picking of fruits, drying them, collection of seeds etc. is done collectively by members of a family and is a household activity. Fresh fruit is usually sold @ Rs.150 per kg and dry @ Rs. 400 per kg, the price of dry fruit, however; varies between Rs. 250 - 450 per kg depending upon the quality of fruit and its variety. Fresh apricots of Halman variety are sold @ 150 Rs. kg, in dried form this variety costs Rs. 400 kg, its kernels are even more costly than the whole fruit and are sold @ Rs. 400 per kg. Apricot oil, usually extracted from bitter Khanta variety, sells for about Rs. 500 per litre. The market value of apricot, fresh or dry, its kernels as well as oil varies depending upon the variety and quality of fruit.

Halman is exported to Srinagar, Jammu, and Delhi etc. in dried from. Phating is another costly variety of apricot; cheapest variety is Khanta which is bitter in taste. About 50% of the total production is exported out from the district in dry form. The government has imposed a ban on export of the fresh apricots from Kargil. Ban was imposed during the reign of Maharaja Hari Singh on the export of fresh fruit outside Kargil for fear of a pest called codling moth (*Cydia pomonella*) which is harmful for apple production in Kashmir valley (Mehdi -Coordinator SKUAST, personal communication).

Medicinal uses: Kernels of bitter variety Khanta are used in treatment of the skin rashes. These are ground and made into a thick paste by adding small amount of water. This paste is applied on the infected area and kept overnight to treat the skin rashes. Taking dry apricots before meals is believed to stimulate digestion. Dry apricot and apricot kernels help in prevention of cold, cough, fever, and flu and are rich source of dietary fibre and iron. These increase and purify the blood. Apricot is also used in treating indigestion, kernels are thought to lower blood pressure. Oil extracted from the kernels of the bitter apricots is traditionally used for curing tumours and is also used to treat joint pain and arthritis. Apricot oil is very costly it is used in messaging body parts especially foot, knees, legs, etc. It is used in cooking and is also applied to hair; it is a good source of antioxidants besides, it is effective in treating minor eye infections. After the oil is extracted the waste is used to make a cup like structure about 200 to 250 g in wt. This cup is black in colour and is used in weaving wool.

Almost all parts of the tree are used for one thing or another. The wood of apricot is used to make articles like bowls and handles of many types of equipment like hammer, knife and spade etc. Wood is also used in making spoons, saddles and stands for cutting and mincing meat. The pruned branches as well as the roots are used as firewood in traditional "chulhas" and "bukharies" in the winter season. Endocarps are mixed with cow dung to facilitate its burning. Leaves are fed to the domestic animals like cow, goat, sheep etc. especially during the winter and autumn seasons. Turbines used in

local flour mills are made from the wood of apricot. Its wood is also used for making a big bowl traditionally used for storing dough. Long sabre like structure is made from apricot wood, which is used to clean animal hides. These animal hides are used for making 'Slakspa'-a local article of dress, worn during the winter months.

Food value: Apricots are a cherished fruit and are eaten fresh and dry, dry form, however, is more preferred. Dry apricots are soaked in water overnight and served in the morning during marriages or they may be taken as such, especially during the winter. A salad is also prepared from the fresh apricots. A kind of bread called 'Derom Taki' in 'Dardi' (the local language in Drass) and 'Chrap Taki' in 'Purki', (the local language in Kargil), is prepared during the winter season and it is mixed with apricot oil and a paste like meal is prepared from it. This meal is taken as a warming food during the winters. It is also served during locally celebrated festival 'Mamani' which means the end of the cold season at the end February month.

DISCUSSION

The present study revealed that apricot cultivation forms primeval industry in the region which gives employment to about 30% of population. This tree species is a prized plant and each part has economic value and very little attendance is needed for its cultivation. It is also used to treat various diseases. Ethano-botanical knowledge is very important as it reflects the ancient practices used in solving different problems by the indigenous communities because of their long experience. It also provides valuable baseline information for the commercial exploitation of bio-resources and development of different far flung areas of the world. This information could also prove useful for the pharmacologists, physicians, phyto-chemists, botanists etc. interested in the development of alternative therapies [7]. The present study revealed that apricot kernels and oil are used to treat skin infections, boils etc. Antimicrobial activity has been reported for apricot kernels [6]. Antimicrobial activity against bacterial species of S*taphylococcus aureus* and *Escherichia coli*, and that against fungal species of *Candida albicans* and *Candida glabrate* [8] has been reported for both bitter and sweet kernels of apricot. The fruits are most inhibitory for the growth of *Micrococcus luteus* [9]. However, antimicrobial activity has not been reported from apricot essential oil [10]. Water extracts of kernels of sweet apricot and bitter apricot have phenolic content of 7.9 ± 0.2 µg/mL and 0.4 ± 0.1µg/mL respectively [6]. Most of the phenolic compounds occurring in fruits exhibit antioxidant activity [9, 11, 12]. Sweet kernels have considerable antioxidant activity in comparison to bitter kernels as seen in the methanolic as well as water extracts of these kernels. The methanolic extracts of leaf also show antioxidant activity [4]. Present study also reports that apricot is used as blood purifier and is a good source of antioxidants. The antioxidant and free radical scavenging properties of apricot has also been established by several other studies [6, 12, 13]. Amygdalin, a cyanogenic glycloside, is known to occur in the apricot seeds which have been reported to be used in the treatment of cancer [14]. Laetrile which is believed to be an alternative treatment for cancer has also been extracted from apricot seeds [4]. Antitussive effects have been reported for apricot kernel [15], besides; it has been traditionally used in gastric inflammations, dermatitis and also as a carminative agent. Apricot oil is also used as laxative and a remedy for otitis and tinnitus [16, 17].

During the present study it was found that bread made using apricot oil and paste of apricot fruit is used during winter months to keep the body warm. As far the food value of apricot is concerned, apricot kernels reportedly are a good source of dietary protein, oil, fiber, phenolic and cyanogenic compounds [13, 18, 19]. Among oils, oleic acid and linoleic acid form the main components of the oil fraction and among carbohydrates, pectic polysaccharides; cellulose and hemicelluloses have been reported from it [20]. Apricot is a rich source of vitamins and minerals and contains vitamin C, beta-carotene, thiamine, iron, potassium, niacin, fruit acids, and a variety of sugars.

Measures to be taken

There is a considerable variation in the yield year after year. Yield is considerably influenced by the rainfall at the time of flowering; if strong winds blow during the peak flowering season or there is scarcity of water, the quality as well as quantity of fruit is affected. Adaptability of the different varieties in different places determines success of cultivation at these places. Key to the regular yield and good quality fruits is to correctly choose the variety which is best suited to the local soil type and the local environment. Traits like environmental adaptability, resistance to diseases and better fruit quality can be further improved by controlled breeding programmes.

Acknowledgements

We are thankful to the Rector, Kargil Campus, University of Kashmir, for providing necessary facilities. The authors are thankful to the locals of the Kargil area who shared their valuable traditional knowledge about this prized plant species.

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