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The Ber Tree of Rajasthan-An Ethical Significance

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ABSTRACT: Botanical Name: *Zizyphus mauritiana Lam.*

Common Names: Indian Jujube, Indian Plum, Chinese Date, Ber, Gangaregu, Badar

The Ber tree is a much branched, thorny deciduous tree with a spreading crown, growing to a height of about 45 feet. It is a hardy species with its origin in India. Its presence is unmistakable in the sandy soils of arid and semi-arid zones of India, and it is widely cultivated for its fruits. The dried fruits purify the blood and are used in the treatment of chronic fatigue, loss of appetite, diarrhea, pharyngitis, bronchitis, anemia, irritability and hysteria. The seeds are used in the treatment of insomnia and nervous exhaustion.

KEYWORDS-Ber, Zizyphus, Rajasthan, significance, treatment

I.INTRODUCTION

Ber fruits have an association with Shabari, one of the extraordinary characters in the epic Ramayana. Shabari exemplifies the fact that the spiritual quest is not a prerogative of any sex, creed, class or community, but the birth right of all human beings.

Shabari was born into a hunter-gatherer community, and lived much of her life in Dandakaranya, the jungles of the Deccan Peninsula. At one moment in her life, she started observing in herself the loss of interest in anything other than the deep void engulfing her. To begin with, she developed an aversion to meat eating, and dropped the habit. There was a growing restlessness in her heart, and she did not know what would quench her thirst for the unknown. One fine day, with an overwhelming sense of dejection, she left her abode, and started wandering in the jungles, with no particular aim in life.

Having mastered the ability to eke out a living and sustain herself from the bounty of nature, she spent days alone, moving wherever her whim led. Fortunately for her, she reached the ashram of Matunga, a hermit who was seeking enlightenment. Sage Matunga could perceive Shabari's noble intentions, the spiritual yearnings in the heart of this tribal woman, so he took her into his care .

Shabari spent several years serving Matunga and the other followers in the ashram. However, just as had happened to her life in her tribal hamlet, she remained dull in spirits, and the monotony haunted her. One day, sage Matunga summoned her and told her something that shook her to the core. He told her that his death was imminent. Second, he told her that Lord Rama, the avatar of that era, would pass by the ashram sometime in the future, and that meeting him would result in her discovering her life's purpose.[1,2,3]

Shabari's miseries increased. She lost her mentor in Matunga and she had no idea who Lord Rama was. What would he look like? Would he come today, tomorrow, at all? How would she address him? Would he even notice her presence? As the cravings in her heart grew, doubts also assaulted her heart, "Will he understand my language? What shall I tell him? What shall I offer Him?" The dull heart of Shabari turned into a volcano.

Months passed, and eagerly Shabari awaited the arrival of Lord Rama. Years passed, and still there was no sign of Lord Rama. Shabari was growing old and frail, but there was no stopping her heart that craved the appearance of Lord Rama. Lord Rama was exiled in the forests of India. The evil Ravana had abducted his wife Sita, and he was searching for her with a heavy heart. It was in those times that Shabari got to see her Lord. The cry of the heart of Shabari, the true seeker, brought Lord Rama to her door.

Shabari could easily see the Divinity in the human frame of Lord Rama. She fell at his feet, and her tears washed the feet of her Lord. When the mother in her woke up, she quickly gathered some Ber fruits. However, she couldn't trust those



fruits. Were they sweet or sour? So she tasted each one, and only when she was satisfied with the quality of each fruit, she fed them to Lord Rama.

Ultimately, Shabari was able to host Lord Rama in her own little way. Lord Rama's heart was touched by her love, and he forgot his personal misery while in her company. Needless to say, Shabari was liberated during that incarnation.

Ber is one of those monumental trees that are unique to every historical Hindu temple. Ber fruits are offered to Lord Shiva, and in all Shiva temples, the fruit is given great importance, especially during Maha Shivaratri, the Hindu festival in honor of Lord Shiva.

The Ber tree is also considered sacred by Sikhs. It is often grown around gurdwaras, as Guru Nanak is believed to have received enlightenment beneath a Ber tree. Probably, the oldest Ber tree is at Amritsar in the Punjab. Known as "Dukh Bhanjani Beri," it was already in existence when the fourth in the lineage of Sikh gurus, Shri Guru Ram Das, founded Amritsar city and the holy sarovar in the 16th century. This particular Ber tree is now over 400 years old and still fruiting! The devotees coming to the Golden Temple complex do not pluck the fruits, but sit under the tree in the hope of a fruit falling. It is believed that if you pray in front of this Ber tree and then take a holy dip in the Golden Temple waters, it will cure you of all your ailments and diseases.

Much is written about how the humble Ber fruits sustained certain historical figures in periods of their distress. The heroic deeds of Maha Rana Pratap Singh of Mewar, Rajasthan, remains etched in the annals of Indian history. The poet Kavi Bhushan lucidly described the struggles of Rana Pratap Singh against the Mughal emperor, Akbar. He described how the ousted king and his family faced the turbulence of their life, and how the humble Ber fruits in the forests of the Aravalli Hills provided nourishment to the royal family.

Ethnomedicinal Uses

The Ber fruits vary greatly in size and shape. They are green at first, turning yellow or reddish as they ripen. The fruits are delicious eaten fresh or dried like raisins. They are also made into pickles and beverages. The raw seeds have a sweet flavor and are eaten as a snack. Apart from being tasty, Ber fruits offer an effective herbal remedy for a wide range of ailments. In Ayurveda, the Ber plant parts are used for treating bleeding disorders, excessive thirst, and bronchial asthma. The dried fruits are considered to purify the blood, improve digestion, and offer relief from constipation. They are used to treat chronic fatigue, diarrhea and anemia. Ber fruits have anti-inflammatory properties that can reduce swelling in the joints.[4,5,6]

Eating Ber fruit is also considered to be good for diabetes, and Charaka has placed the Ber tree among the group of plants that is a tonic for the heart.

Ripe Ber fruits help in quick healing of wounds, decrease swelling and bring back normal texture of the skin. Ber fruit powder with honey is applied on the face in the form of a face mask to attain a glowing skin, help manage skin infections, and promote healing of wounds (it should be rinsed off after four to five minutes).

Dried Ber fruits are good for maintaining bone density. Ber fruit powder is very useful for reducing the burning sensation and swelling of piles. Charaka Samhita, one of the principal contributors to Ayurveda, recommends a Ber decoction sitz bath for treating hemorrhoids.

Ber fruit powder and its leaves help to control hair fall. When applied on the scalp, it also promotes new hair growth and removes dryness.

Ber fruits, including the seeds, are considered to have sedative qualities and they are natural sleep inducers. They also provide relief from anxiety and cure hysteria. The fruits and seeds are also used to treat vomiting, flatulence, nausea, leprosy, and ulcers.

A paste made out of Ber leaves is applied externally to relieve burning sensations and fever. The leaf paste is also used to treat boils and abscesses. Ber leaves are also a part of Panchamla Thailam oil, used for the treatment of rheumatoid arthritis.

Ber bark is used to treat diarrhea, dysentery, gingivitis and boils, and a decoction of Ber bark is used to treat bloating and abdominal distention. Ber roots are also used in case of fever, wounds, ulcers, etc.



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II.DISCUSSION

The presence of a diverse group of secondary metabolites found in the Ber tree makes it a remarkable medicinal plant. Ber fruits are very rich in vitamin C (188 to 544 mg per 100 gm pulp), B1 (thiamine) and B2 (riboflavin). They also have a high Vitamin P (bioflavonoid) content (354 to 888 mg per 100 gm pulp). The fruits are also filled with minerals like potassium, phosphorus, manganese, iron, and zinc.[7,8,9]

In research published in the journal *Pharmaceutical Biology*, in 2009, extracts and fraction of the Ber plant have shown appreciable results in decreasing serum glucose level and other complications associated with diabetes. E.E. Jarald et al. support the inclusion of Ber plant parts in traditional anti-diabetic preparations. And according to a study published in the *Iranian Journal of Basic Medical Sciences* in 2015, the fruit pulp can prevent diabetic neuropathy.

An article published in *Phytochemistry* in 1996 confirms the sedative, analgesic, anti-inflammatory, hypoglycemic, antibacterial and antifungal activities of Ber. The seed contains a number of medicinally active compounds, corroborating the traditional use of Ber plant parts in the treatment of palpitations, insomnia, nervous exhaustion, night sweats, and excessive perspiration. A study published in *Pharmacognosy Reviews* in 2015 attributes anti-cancer properties to Ber fruits.

a) Other Uses

The reddish wood of Ber is strong and durable, used in making agricultural implements, axe handles, toys etc. The Ber tree is a good source of wood fuel, and also high-grade charcoal. The young leaves can be cooked as a vegetable.

The leaves make for nutritious fodder, which are also used for growing tassar silk. It is a good host for the lac insect, which deposits an orange-colored resin that is collected and processed to make shellac. Ber bark, when pounded and mashed in water, yields brown and reddish dyes.

The Ber tree is an important source of nourishment for the endangered antelopes of India, like the Indian Gazelles and Black Bucks, while its fruits are relished not only by birds but a wide range of mammals, like jackals, wild dogs and honey badgers.

The fruits are very much liked by children. Delicacies are made from them, and a tea is made from a decoction of the fruit with cinnamon and ginger.[10,11,12]

b) Propagation

Ber is propagated through seeds, and through other vegetative means. Storing of seeds for over four months, or the scarification of seeds, helps better germination. To germinate, seeds need full sunlight. Ber grows in a wide variety of soils and withstands extreme temperatures, thriving under dry conditions. There are numerous cultivated varieties of Ber in India, so it is difficult to identify the original wild variety.

2) Climate

- Hardy plant. Can do well in unfavorable climate. Prefers hot & dry climate & adequate moisture during fruiting.
- It is extremely drought hardy owing to its deep root system and other xerophytic characters.
- The tree prefers atmospheric dryness for development of good quality fruits. Excessive atmospheric humidity is not good for satisfactory fruiting. Grown up to 1000m. above MSL.

3) Soil

- Deep sandy loam is better. Thrives under adverse conditions of salinity. drought and water logging.

4) Varieties

- About 125 varieties are found in India. Umran, Gola, Seo, Mehroon, Kaithali, Kantha etc. are important varieties.

Classification according to ripening period :

- Early ripening (February) : Gola, Seb, Safeda,
- Mid season (First- Third week of March.) : Kaithali, Reshmi.
- Late ripening (Fourth week of March-mid April.) : Umran, Kantha, Elaichi.

5) Propagation

- Seed : Main drawback of seed propagation is that fruits are small and of poor quality.



- Vegetative : Most common method of propagation of ber is by I or T (shield) budding. Rootstock seedlings are raised by sowing seed kernels extracted by breaking the stone (endocarp). These germinate in about one week. The seed stones can also be sown as such but take nearly one month to germinate. Seeds of any locally adapted and vigorous ber trees can be used for raising rootstocks in the field during July - August for in-situ budding or can be budded in the nursery beds. Budding is done during May-June on *Zizyphus mauritiana* rootstock.

6) *Planting*

- Spacing : Rainfed - 6 x 6m. Irrigated - 8 x 8m. Pits of 60 x 60 x 60cm size are dug and filled with 50 kg FYM + soil + Aldrin or BHC or Methyl prathion powder. Planting is done during June-Aug.
- Irrigation : Immediately after planting, 4 - 5 days up to 3 months. Most part of the year no irrigation is required. Irrigation is required during fruit bearing period ie. Oct - Feb.
- Intercropping : Intercrops are taken up to 2 years. Mung, Guar, during Kharif. Methi during Rabi.

7) *Training and pruning*

- During the first 2-3 years after planting, ber trees should be trained to develop a strong framework.
- After that old growth is to be headed during March, keeping 1-2 nodes above the graft union to induce vigorous new growth.
- One upright growing vigorous shoot is retained to develop into main trunk which is kept clean of secondary branches up to 30cm height from the ground level.
- On the main trunk, 3 or 4 well-spaced and favourably located main branches are allowed above when it is headed back.
- During the second year, these main branches are also clipped retaining 3 to 4 secondary branches on each of them, This process is continued to develop tertiary branches.
- Upward growing shoots are retained at each stage to develop an upright tree stature. Not more than one upright growing shoot is retained at a node so that narrow crotches are avoided.
- This basic frame of the tree is maintained by removing of water sprouts as and when they emerge. Correction in the framework is done at the time of annual pruning.
- Annual pruning in ber is essential to induce maximum number of new healthy shoots which would bear good quality fruits.
- It is also essential to remove the undesirable, weak, intercrossing, diseased and broken branches to avoid crowding and to encourage healthy growth for maximum fruit bearing.
- Pruning is done during the hot and dry season when the tree sheds leaves and enters into dormancy.
- In Tamil Nadu, the trees are pruned during January - April, in Maharashtra and Gujarat pruning must be completed by the April-end and in Haryana by the May-end .
- Severity of pruning also differs at different locations.
- In general, light pruning, at about 25 buds, is the best. However, pruning could be done at 15 to 20 buds under more moderate climatic conditions.
- All the secondary shoots should be completely removed. Spraying of 3% thiourea or potassium nitrate once in 2 days before pruning induces bud sprouting from maximum number of nodes.

8) *Manures and Fertilizers[13,14,15]*

Bearing tree/yr.

	FYM (Kg)	N ₂ (g)	P ₂ O ₅ (g)	K ₂ O(g)
Rainfed.	30	100	50	50
Irrigated.	60	500	400	400

- For rainfed, full dose given in July & for Irrigated crop FYM, P, K & ½ N given in July. Remaining ½ N in Sept.



III.RESULTS

9) *Flowering*

- Flower buds born mostly on current growth. Flowering starts from 1st week of September to Mid of November.
- Ber is a Cross pollinated crop.

10) *Harvesting & yield*

- Yield starts after 3-4 yrs. Harvesting time is during February to April.
- Ber is non-climacteric fruit. So neither under ripe nor over ripe fruits are plucked up. Proper ripened fruits become soft & acidity decreases & sweetness increases.

11) *Yield :*

1. Early variety : 100 kg/tree.
2. Mid season variety : 150 kg/tree.
3. Late variety : 200 kg/tree. (Umran)

Ber or Jujube is a sweet, tart fruit that reminds many of us of our school days, when we used to buy these from fruit vendors outside the school, known for offering a unique kind of thrill while enjoying every single bite. Found largely during the spring season in Rajasthan, it is cultivated widely in tropical regions too. This wonder fruit boasts with an impressive nutrient profile that delivers a ton of healing health benefits. Since times immemorial, ber fruit has been famed as the fruit that removes sorrow. Resembling palm dates in appearance, ber is also known as Indian jujube, red dates, Indian plum, Chinese apple, Chinese date, Korean date, India dates across the world.

In the Indian subcontinent, Jujube is known as Ber in Hindi, Regu chettu in Telugu, Ilandai in Tamil, Bore hannu in Kannada and Ajapriya, Kola, Badari in Sanskrit. Tracing the history of jujube it was originated in the Classic of Odes, a Chinese anthology of poems dating back to the 6th century BC. It was highly valued as a medicinal plant in China and the Southern part of Asia for at least 2500 years.

According to the holistic science of Ayurveda Jujube has been extensively used as an effective herbal medicine from centuries. The whole plant including fruit, seed and leaves are valued for its incredible healing characteristics. Ber fruit imbued with vitamin C and B is used for treating bleeding disorders, excessive thirst, fever and burning sensation. The antipyretic activity of ber leaves is applied topically that helps to mitigate fever. In addition, ber fruit powder combined with honey is used as a mask to heal skin infections, owing to its potent healing properties that promote faster wound healing. Fresh and dried ber balances the vata and kapha dosha, while sour fruit pacifies the vata and kapha dosha.[16,17,18]

IV.CONCLUSION

Ber is a low calories fruit loaded with dietary fibre, vitamins and minerals that makes it an excellent option as a healthy snack. Packed with vitamin C, a potent antioxidant, ber fruit triggers the immune response and keep infections at bay. While it also contains fair amounts of potassium, which plays a significant role in regulating muscle functions and maintain electrolyte balance. Along with that, Ber fruit also comprises 18 of the 24 essential amino acids that promotes growth and development. Apart from this, these shiny fruits are a powerhouse of several antioxidants including flavonoids, polysaccharides and triterpenic acids that scavenges detrimental toxins and safeguards against chronic health conditions like diabetes, cancer and heart disease.

Being naturally loaded with sugars ber fruit offer you with an instant source of energy. Dried jujube is a more concentrated source of sugar as extra sugar are added during the drying process.

Therapeutic Benefits of Ber/Jujube

Promotes Sound Sleep

Ber fruits were traditionally used in Chinese medicine to treat insomnia and promote better sleep. Both the fruit and seeds are endowed with flavonoids such as saponins and polysaccharides that are known to exhibit sedative and hypnotic properties. It was valued as a natural sleep promoter, which helps induce sound sleep by providing a calming effect on the nervous system.



Promotes Digestion

Packed with dietary fibre and carbs, ber fruits are a good source of energy that aids in triggering metabolism and keeps you active all through the day. While a huge volume of fibre in jujube helps to soften and add bulk to stool, thereby regularising bowel movements and aids in treating constipation. In addition, jujube juice may facilitate to strengthen the lining of G.I tract and reduces the risk of ulcers, injury and any harmful bacteria that may reside in the stomach and also offers respite from all other tummy issues.

Prevents Cancer

Blessed with vast reserves of phenolic compounds that trigger antioxidant activity, jujube fruit work effectively to get rid of harmful free radicals, combats oxidative stress and lowers the risk of cancer. Evidence has also revealed that jujube extract possesses powerful anti-cancer properties that inhibit the spreading of the cancerous cell, particularly that of leukaemia and avert the growth of tumour cell formation. Aside from this, potent antioxidant properties of ber fruit is also valuable in averting the risk of several types of cancer cells, including ovarian, cervical, breast, liver colon and skin cancer.

Augments Heart Health

Jujubes are one of the best fruits boasts with heart-friendly nutrients that are known to uplift heart health and optimise cardiac functions. Ample quantity of potassium and low in sodium, it relaxes the blood vessels and helps control blood pressure. This fruit also works as a potent anti-atherogenic agent that averts fat from getting clogged up in the arteries. Moreover, loaded with dietary fibre ber fruit maintain lipid profile and lowers the risk of cardiovascular disease.

Enhances Blood Circulation

Good blood flow means all your vital organs are getting an adequate supply of oxygen-rich blood and make you feel energized. Being intrinsically rich in potassium, phosphorus, manganese, iron and zinc, these minerals help in maintaining cardiac health. While, the regular edition of jujube is a great way to pump iron reserves, improve haemoglobin count and regulate proper blood flow in the system.

Combats Alzheimer's

Research has shown that ber fruit can help treat Alzheimer's by fighting cell degeneration and assist in improving the cognitive functioning of the brain. Jujube fruit can be a great addition to the diet plan of a person suffering from dementia, neurodegenerative disorder and help them boost memory power.

Bolsters Immune System

This tiny fruit is a powerhouse of potent antioxidants such as vitamins A and C. These nutrients combat harmful toxins, prevent oxidative stress and lowers the risk of chronic inflammation by regulating the production of inflammatory cytokines. Besides this, jujube also possesses strong anti-allergic and anti-anaphylactic characteristics that prevent hypersensitivity and keep seasonal cold and fevers at bay.

Reduces Inflammation

Both jujube extracts and jujube seeds oil were known to exhibit potent anti-inflammatory properties. Topical application of jujube extracts may help alleviate muscle aches and joint pains. Jujube fruit is the best bet for a person suffering from arthritis, as it works well to provide relief and lessen swelling in joints.

Fights Stress and Anxiety

Feeling stressed or depressed, snack on a handful of ber fruit, as it has been proven to have soothing effects on the brain and nervous system. It was greatly prized in traditional medicine as a natural remedy to treat the symptoms of stress, anxiety and depression. Moreover, sedative properties of jujube fruit are also known to balance cortisol hormones and helps to keep both mind and body relaxed.

Fortifies Bone Health

Osteoporosis is a debilitating condition which can impact posture, bone function and flexibility. Jujube fruit extracts and seeds oil are highly valuable for older people or those with brittle bones that can alleviate pain in the joints. Blessed with bone-fortifying minerals –calcium, phosphorus and magnesium promote connective tissue strength and enhance bone health and mobility.



Good For Weight Loss

Ber fruit bestowed with immense quantities of dietary fibres and proteins keeps you satiated, delays digestion and thereby manages weight loss. Jujubes are low in calories, carbohydrates and absolutely have no fat. This nutritionally dense fruit keeps untimely hunger pangs for junk food at bay and can be eaten as a healthy snack for satisfying sweet cravings[19]

Purifies Blood

The richness of antioxidant compounds saponins and alkaloids in jujube fruit may help to detox blood. Loaded with powerful nutrients jujube fruits extracts help to clear out harmful toxins from the system, combats inflammation and lowers the risk of several blood-related disorders.

Supports Wound Healing

Jujube fruit can help combat pathogens and germs as it is loaded with immune triggering phytochemicals. The flavonoid compounds in jujube have been known to possess strong antimicrobial properties, which is beneficial in treating infections in children. In addition, the presence of betulinic acid in jujube fruit inhibits the growth of both *Staphylococcus aureus* and *E.coli* that are responsible for several bacterial infections.[20]

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