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JEWEL OF THE COLD DESERT – SEABUCKTHORN



Pallavi Sharma

Ayurvedic Medical Officer, Govt. Ayurvedic Health Center,
Lower Pandoga, Dist. Una (Himachal Pradesh)

ABSTRACT

The status of flora and fauna in any particular geographical area is an outcome of interrelationship of climatic, physiographic, edaphic and biotic factors. Seabuckthorn (*Hippophae* spp.) is a perennial, thorny bush with yellow berries is widely distributed in the cold arid Trans Himalayan region. It is rich in pharmaceutical, therapeutic, and cosmetic values and serves as a source of multivitamins and food supplement. Besides, it contributes to fix nitrogen in the soil making it more fertile and plays important role in wildlife conservation.

KEY WORDS– Seabuckthorn, Cold desert, Nitrogen Fixation, Lahaul Spiti, 5-hydroxy tryptamine

INTRODUCTION

Cold desert area of Lahaul Spiti, upper areas of Chamba & Kinnaur districts comprising 42% of the total geographical area of the state of Himachal Pradesh, is an example of one of the harsh climatic conditions with extremely low temperature, scanty rainfall, high wind velocity, scorching sunshine in sunny hours; little vegetation due to sloppy physiographic condition & indurated rocks resulting in high rate of soil erosion, landslides, low agricultural productivity and scarcity of fuel & fodder.

So natural resources in this area are limited to only a few plant genera like *Hippophae*, as they are adapted to cope up with the harsh climatic conditions. Genus *Hippophae* (family- *Elaeagnaceae*) commonly called as 'Seabuckthorn' is a spinaceous and arborescent shrub varying in height from 50 cm to >8 m. It can withstand wide range of temperatures from -43 to 40°C (1, 2). This

unique feature enables the species to adapt very well in harsh climatic conditions. Its ecological, agricultural, nutritional, medicinal, food, fuel, fodder, timber and ornamental values make this plant most valuable and ideal for National Mission for Green India with Ministry of Environment & Forest, Govt. of India, under National Action Plan for Climate Change. For this purpose CSK Himachal Pradesh Agriculture University, Palampur with its Highland Agricultural Research & Extension Centre (HAREC) Kukumseri in Lahaul & Spiti, under DDPS (Desert Development Projects) through various PIAs (Project Implementing Agencies), is providing mass scale plantation of high yielding forms of Seabuckthorn for the cold desert areas of Himachal Pradesh.

DISCRIPTION & DISTRIBUTION

Three species of seabuckthorn (*H. rhamnoides* L. subsp. *turkestanica* Rousi, *H. salicifolia* D. Don and *H. tibetana* Sch.) are mostly found in Lahaul and Spiti district of Himachal Pradesh. However, *H. salicifolia* D. Don. is recorded in Kinnaur (Baspas valley), Chamba (Pangi area), Kangra (Dhauladhar ranges), Shimla (Dodrakwar) and Kullu (Parvati and Sanj valleys) between 2,000 and 4,500 m above sea level. It is locally called Chharma, Sutz, Tirkug, Chasterlulu, Sarla or Pilickcha, in Himachal Pradesh and Tsermang, Leh berry in Ladakh. Male & female plants are separate. Female plant produces orange berries 6–9 millimetres in diameter, from mid april to mid august. It bears foliage from april to novembe^(3,4,5).

THERAPEUTIC VALUE

- *Hippophae rhamnoides* is found to have strong antioxidant and radioprotective effect and is rich in Ca, Ph, Zn, Mg, Fe, Se, Mn; fatty acids, sterol, tocopherols, estradiol, catechol; proteins and other valuable nutrients, such as globulin, albumins, flavonoids, carotenoids, betacarotene, lycopene and zeaxanthine (6) .
- Its bark and fruit contains 5-HT (5 hydroxy tryptamine) a neuro transmitter that controls neuro endocrine system, enhances memory, inhibits cancer cells (7).
- The seed oil of seabuckthorn has great value in pharmaceutical and cosmetic industry for its anti wrinkle and anti skin sclerosis properties. Traditional and modern uses of oil in healing of skin diseases including eczema, burns, wounds, sun burn, therapeutic radiation treatment and cosmetic laser surgery are well documented. Its oil was used by Russian cosmonauts for anti radiation effect in space travels (8) .
- Seed oil preparation is found to heal gastric ulceration & erosions faster (in 6 days) than any other routinely used drugs like famotidine, lansoprazole (7-10 days) (9) .
- Local physicians called ‘amchis’ use this drug in Tibetan system of Medicine.
- China is the first country who has recognised its therapeutic potential and has approved its oil as “green or organic food”.

NUTRITIVE BENEFITS

- Fruits/berries are rich in vitamin C-300-166mg/100gm which is 4-100 times higher than any other fruit. Owing to greater quality of vitamin C Seabuckthorn is called ‘King of Vitamin C’ (10).
- It contains Vitamin E -162-225mg/100gm; vitamin A-11mg/100gm; vitamin K-100-200mg/100gm .
- Leh berry juice by Godrej Industries Ltd. at Bhopal (M.P.) in joint venture with Ladakh Foods Ltd. is a natural energizer and increases body endurance against diseases & vagaries of high altitude.
- Multivitamin herbal beverage developed by DRDO in factory at Leh is supplied to the defence

personnel posted at border areas.

- H. salicifolia genotype locally called as 'Drilbu' is a high yielding (5.5kg/plant), mild thorny, large fruit (32/100), rich in vitamin C (950 – 1300 mg/100) and omega fatty acids is the best forms of seabuckthorn in the world . It is raised in HAREC Kukumseri Lahaul (11).

BIO DIVERSITY CONSERVATION

- Seabuckthorn is an effective nitrogen fixer , as it has 'Frankia' bacteria in its root nodules. This symbiotic relationship allows it to fix atmospheric nitrogen and thus enhances soil fertility.
- Roots nodules have better soil binding properties thus prevents soil erosion ,assists in retaining surface runoff ,and prevents siltation of rivers.
- A large number of birds, rodents are entirely dependent on seabuckthorn for food & shelter.
- Wild ecological adaptation, fast growth, efficient nitrogen fixation, make this plant well suited in soil & water conservation , marginal land reclamation and for massive afforestation programmes at high altitudes.
- Wild variety i.e H.rhamnoides genotype is ideal for afforestation purpose.

ECONOMIC POTENTIAL

- Food products such as syrup, carbonated juice, sweet wine, beer, jam and jelly,powder, biscuits, etc., prepared by processing the fruits are highly demanded in national and international markets e.g Tsering tea , Spiti Magic Squash and Spiti Magic Beverages, Rohtang Special Squash etc.
- The fruit skin (after extracting pulp) is utilized for making tea. The leaves from male plant are also commercially used to make tea .Thus it has the potential to boost up the economy of the tribal communities. The government agencies (like MOE&F, DRDO, ICAR etc.) have prioritized seabuckthorn as the most potential crop for the cold desert region.
- An NGO named MUSE has been working in Spiti valley of Himachal Pradesh since year 2002 towards economic livelihood from Seabuckthorn .The State Govt. has established 4 Seabuckthorn processing/pulping units at Rangrik, Shego, Tabo and Shunsha in Lahaul Spiti district of Himachal Pradesh.
- Indian council of agricultural research under 'Production to Consumption system' approved a value chain on Seabuckthorn for Lahaul valley of Lahaul spiti district of Himachal Pradesh. The project emphasizes on production, collection, processing, value addition, consumer acceptability of end products and branding of seabuckthorn as health food (11).

FUEL WOOD and OTHER USES

- Since ancient time, it has been used prominently as fuelwood , being one of the rare resources to support human life during prolonged winter season when high scarcity of fuelwood occurs in the region.
- Its fruit waste after extracting the pulp is used as an animal feed.
- Fruit and leaves are animal and poultry feed.

CONCLUSION

Himalayas is one of the mega biodiversity region of the world. In Sanskrit there is a saying- 'A hundred divine epochs would be insufficient to explain the virtue of the Himalayas'. Pharmacologists opine that there are greater possibilities of the presence of bioactive molecules in high altitude plants

in view of their completion of lifecycle under stressful conditions. Seabuckthorn is one such promising plant which has great potential for therapeutic purpose, sustainable environment protection, commercial forestry in cold desert areas of Himalayas and thus provide ample opportunities to the local people to reap great benefits by utilizing this hidden treasure of the Himalayas.

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