

tSermang – a priceless gift to lackadaisical Ladakhis

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Genus *Hippophae* L. belonging to the family Elaeagnaceae is a dioecious, deciduous, thorny, winter hardy, drought-resistant shrub or small tree¹. Worldwide 18 species and subspecies of *Hippophae* have been reported², of which 4 species and/or subspecies are found in India³. The plant occupies an area of around 30,000 ha, most of which (11,500 ha) is in Ladakh⁴. Two species, namely *H. rhamnoides* subspecies *turkestanica* and *H. tibetana* grow in this region⁵. Known by the common English name seabuckthorn, its local vernaculars vary in different parts of Ladakh; some of these are 'tSermang', 'tSes-ta-lulu', 'shibshu-lulu', 'sTarbu', 'Nak-tSer', etc.⁵. All the species of this genus have been extensively studied for their diverse applications. Being a rich repository of many essential vitamins, amino acids, antioxidants and minerals, seabuckthorn has enormous economic utility and the potential to sustain more than one kind of industry.

Some of the uses of the plant are listed in Table 1.

The people of Ladakh have been aware of the favourable health-promoting effects of seabuckthorn since ages. Amchi system of medicine, the most prevalent in Leh, utilizes almost all parts of seabuckthorn. For instance, the fruit pulp is useful in treating fever, cold, cough, etc.⁵. The fruit is reportedly a tonic for malnutrition, for improvement of digestion⁶ and along with the bark is able to speed up healing and regeneration of the skin and digestive mucosa in inflammatory and ulcerative conditions like burns, mouth ulcers, sun burn and many others⁴. Fruit juice when applied in the form of emulsion, prevents wrinkles underneath the eye and provides a healthy glow to the skin. Leaves are also a preferred source of fodder for cattle^{4,7}. However, very little or no attention has been paid to translate this indigenous knowledge into sustainable industry.

The present market for seabuckthorn might have been doubled compared to that in 2005, with the annual turnover in the international market is estimated around 229 million Euros, contributed by some 15–20 countries of the world. China, Russia, Italy, Sweden, Finland,

Germany and Romania are still the major players in the market⁸. Table 2 gives the area under seabuckthorn cultivation and annual production of berries in different countries.

Annual production of berry is 5 tonne/ha in Germany⁹. In Ladakh, approximately 11,500 ha is pure seabuckthorn-growing area⁴. Thus, the estimated yield should be approximately 57,500 tonnes. However, this is an overestimate because in the Himalayan region, the annual yield is reported to be 0.45 tonne/ha. This huge gap in the harvest can be on account of non-fertile soil and also because the berries are collected from the wild. Since no or very little cultivation is done for this plant, it is the need of the hour to cultivate it on commercial scale to exchange this nature's gift into currency. This is possible only after proper examination and breeding experiments for the

search of elite genotypes. Researchers throughout the world are focusing on improving the plant through breeding experiments. Since seabuckthorn is dioecious, breeding aims at improving plants of both the sexes. However, the objectives for the production of female and male cultivars differ because qualitatively more criteria are to be met in the female track¹⁰. At the morphological level, it is not possible to distinguish male from female until the plants flower¹¹. This hampers selection of gender at earlier stages of the breeding programme. Nevertheless, successful hybridization between different species of *Hippophae* has resulted in plants of superior genotypes. Under one such programme, 'Indian-Summer' a cultivar has been released in Canada¹². At present, a large number of varieties have been released all over the world for cultivation,

Table 1. Uses of seabuckthorn

Plant part	Usage	Reference
Bark	Pharmaceutical	4, 15
	Cosmetics	4
Leaves	Pharmaceutical	11, 15
	Cosmetics	4
	Herbal tea	4
	Animal feeds	11
Fruit	Pharmaceutical	11, 15
	Juice/food	11
	Residues (animal feeds)	11
Seeds	Pharmaceuticals	11, 15
	Cosmetics	4
	Residues (animal feeds)	11

Table 2. Annual berry production and total area under cultivation in some major seabuckthorn-growing countries in 2005 (ref. 8)

Country	Area under seabuckthorn plantation (ha)	Annual berry production (tonne)
China	1,566,000	35,000
Russia	3,200	5,000
Sweden	300	424
Germany	240	550
Finland	222	112
Romania	170	400
Italy	70	150
India	30,000	?
Ladakh	11,500	200?

some of which are Druzhina, Podrugha, Kaskad, Zarnitsa, Zolotoy, Krasny Fakel, etc.¹³. However, no such attempts for development of variety have been made in Ladakh so far.

As far as the selling price across the globe for fresh/frozen berries is concerned, it ranges between 15 and 220 Euros per kg (ref. 8). Unfortunately, India with such an abundance of raw material, is not even a minor contributor to the international market. Although in 2007, Ladakh, especially Leh district, reportedly harvested 2000 tonnes of berries worth Rs 1.4 crore¹³, which is 0.00076% of the world turnover.

The reasons for such a wide gap among area-wise seabuckthorn cover, annual berry production and annual turnover are many. Administrative problems and technical gaps have added to poor production as well as market availability. However, the most important factor in India, that too for Ladakh, is the lack of awareness among common masses, lack of cooperation among villagers, villages, districts and also the state. Besides, under-utilization of the plant can also be attributed to lack of farmer's choice because of its low yield, thorniness, thicket formation (bushy growth), etc. Other factors are irregular male and female ratio in natural population, excessive cutting of male plants for biofencing and fuel wood, weedy nature and comparatively smaller size of the fruit.

In order to overcome these problems and to bring India into the international market, several important decisions must be made at the earliest. These include: (1) Awareness programmes need to be initiated at village level. (2) Registered cooperative societies need to be set up at village level in every village of Ladakh. (3) Members of these societies should be

given training on cultivation, harvesting and post-harvest management of the crop. (4) New administrative units should be set up to look into the details from cultivation to marketing. (5) Subsidized equipment should be provided to these societies. (6) Within a radius of 100 km, a processing unit must be established to reduce the risk of post-harvest problems associated during transportation. (7) Proper markets need to be established, and stress be laid on the production of value-added products such as herbal tea, soap, cosmetics, jams, jellies, etc. (8) Last but not the least, a laboratory needs to be established in the region to undertake proper research on this plant and assess new bioactive compounds of importance.

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