The Economic Significance and Ecological Value of Seabuckthorn

Economic Significance

Seabuckthorn (*Hippophae rhammnoides*) a deciduous shrub or tree, belonging to the family *Elaeagnaceae*, is widely distributed throughout the temperate zones of Asia and Europe and at high altitudes in the sub-tropical zones of Asia. The berries, usually yellow in colour, are rich in nutrients and bioactive substances such as sugar, organic acid, amino acid, carotene, flavone, and Vitamins B., C., E., K., and P. The Vitamin C content is 5-100 times higher than in most fruits and vegetables (Table 1). The pulp and seeds also have a high content of oil (Table 2). Therefore, seabuckthorn is used in the food and medicine industries.

In 19th century Russia, the berries were used for making wines, jams, and other types of food. Interest in the plant began to increase at the beginning of the 20th century when horticulturalists started to introduce the plant into orchards. In the 1940s, especially after the Second World War, nutritionists and pharmacologists analysed the vitamin components and found that seabuckthorn could be used not only as a food but also as a medicine. Several countries, including the USSR, Mongolia, Poland, West Germany, Finland, Italy, Norway, Hungary, Canada, and the USA have been studying this amazing plant.

Table 1. Comparisons of the Vitamin Content of Seabuckthorn and other Fruits (mg/100g) and Vegetables

	V_A	V_{B1}	V_{B2}	V_P	V_K	V_C
Seabuckthorn	11.00	0.04	0.56	1000.0	100-200	300-16000
Cili (*Rosa roxburghii*)	4.83	0.05	0.03	2909.0	-	1000-3000
Hawthorn	0.82	0.02	0.05	-	-	100-150
Kivi fruit (*Actinidia chinensis*)	-	-	-	-	-	-
Oranges	0.55	0.08	0.03	-	-	50
Tomatoes	0.31	0.03	0.02	-	-	11.8
Carrots	4.00	0.02	0.05	-	-	8.0

Source : Author

Table 2. Comparision of the Composition of Fatty Acids, Vitamin F, and Vitamin A in Seabuckthorn Oil and Other Nutrient Oils

	Fatty Acid Component (%)			V_E	V_A
	Saturated acid	Unsaturated acid	Linoleic Linolenic acid	(mg/100g)	(mg/100g)
Seabuckthorn Oil	13.7	86.0	64.6	93.2	4.35
Wheat Embryo Oil	-	-	-	33.8	-
Sunflower Oil	8.0	92.0	81.4	3.3	-
Maize Oil	15.2	84.8	48.3	34.0	0.81
Soyabean Oil	14.8	83.7	62.8	7.5	0.11

Source : Author

Ecological Value

Growing at altitudes between 60-5,200m the distribution of *Hippophae* is extremely wide throughout various geographical areas of the world. The plant is capable of withstanding temperatures of -60°C and does not wither at a heat of 40°C. Some species grow well in regions with precipitations as little as 300mm and others can endure inundation. Yet others can grow in soils having a pH factor of 9.5 and which contain 1.1 per cent salts.

The plant has excellent nitorgen-fixing properties, and its extensive root system is valuable in controlling soil erosion. On average, a six year old seabuckthorn plant will have 180g of root nodules or 100-140 nodules/m^3 of soil. A hectare of seabuckthorn can fix 45 kg, or more, of nitrogen, and this is twice the amount that is fixed by soyabean plants within the same area of land.

Farmers on the Loess Plateau of China often plant out seabuckthorn along with potatoes. Because the seabuckthorn bushes make the soil more fertile, the potato yield in such fields is much greater than in fields without seabuckthorn bushes. In addition, the root systems of seabuckthorn secrete acid compounds that improve alkaline soils.

Through bisexual and asexual propagation, masses of bushes are formed on hillslopes or along the banks of rivers. With its luxuriant foliage and strong root system, it can retain the surface run-off and prevent soil erosion by wind and water. Moreover, the masses of bushes increase the content of organic matter in the soil and improve its physical and chemical properties. For example, in Yunnan County, in the Shanxi Province of China, there was no vegetative covering along the Changtau River 15 year ago, and thousands of tons of soil were washed down into the Yellow River. To prevent a reoccurrence, seabuckthorn was planted along the banks of the Changtou, and now, it is estimated, its dense bushes prevent the loss of between 3-5 million tons of soil per annum, surface run-off has decreased by 80 per cent, and erosion has decreased by 75 per cent.

Seabuckthorn is also an excellent source of firewood, since the calorific value is more than 4,000 Kcal/kg.