

# Seabuckthorn—a boon to humankind

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*Hippophae rhamnoides* L. ssp. *carpatica*, (*Elaeagnaceae* family), a little tree, commonly called sea buckthorn (SBT), has narrow, willow-like leaves and stinging thorns. Soft, delicious, vivid orange berries that mature in August and September are densely crowded on its branches. It is a temperate, thorny, nitrogen-fixing deciduous shrub and bushy plant that loves to bloom on the snow-covered summits of the arid Himalayas. Berry picking is done in September. The plant is reported to be drought resistant and resilient, withstanding temperatures as low as -43°C to 40°C. The bush has good possibilities for usage as fuel, fodder, fence, medicine, and fruit, in addition to being employed as a prospective forest species for greening degraded and undulating terrain in Ladakh. It can withstand subzero temperatures and minimal precipitation. Because of its extensive root system, it serves as a powerful soil binder and prevents erosion in areas that are vulnerable to it. Although sea buckthorn now has more than 150 cultivars, more are continually being created. The temperate regions of Asia, Siberia, Europe, and all subtropical regions are home to this bush species, which is particularly prevalent at high altitudes. China, Mongolia, Russia, Northern Europe, and Canada account for 90% of the world's Seabuck thorn species. The biggest producer of seabuckthorn is China. More than 70% of the nation's entire land (13,000 hectares) is used as a seabuckthorn resource. Without much human intervention, seabuckthorn naturally grows on the steep slopes in the Ladakh area of Jammu & Kashmir. It may be found in the Himachal Pradesh districts of Lahaul-Spiti, Kinnaur, and Chamba. In the North East, it may also be found in Sikkim, Arunachal Pradesh, Kumaon, and the Garhwal highlands of Uttarakhand. In the trans-Himalayan region of Ladakh, seabuckthorn is a crucial plant both environmentally and commercially.

Seabuckthorn berries are one of the most nutrient-dense foods. Fruit juice contains significant amounts of sugar, organic acids, amino acids, essential fatty acids, phytosterol, flavonoids, vitamins, and minerals. Vitamins, carotenoids, flavonoids, isoflavones, polyunsaturated fatty acids, free amino acids, elemental elements, and phytochemicals are just a few of the bioactive substances that are thought to be present in sea buckthorn extracts, which represent a novel source. These compounds also have strong anti-oxidation, anti-ageing, anti-atherogenic, anticancer, antimicrobial effects, anti-tumoral, and anti-inflammatory properties. Vitamin C represents a nutrient of major importance in Seabuck Thorn due to its presence in large quantities ranging from 53-3,909mg/100g. Considering that fresh orange juice contains 35-56mg/100ml and Aonla contains 478.5mg/100ml, the value of seabuckthorn as a source of Vitamin C is apparent. According to estimates, there is enough vitamin C in

seabuckthorn plant berries worldwide to satisfy all of the world's population's nutritional needs. In addition to vitamin C, the juice also has vitamins A, E, riboflavin, niacin, pantothenic acid, B6, and B2. Compared to other fruits including apricot, banana, mango, orange, and peach, the concentration of vitamins B2, B3, B5, B6, B12, C, and E is significantly greater. Due to the high concentration of these vitamins, seabuckthorn is also high in calcium (70-98 ppm), magnesium (150-240 ppm), iron (40-150 ppm), and phosphorus (110-133 ppm). 18 different types of free amino acids have been found in seabuckthorn juice, of which 8 are essential for human health. An important oil source, seabuckthorn seed oil has a 1:1 ratio of omega-3 to omega-6 fatty acids and has a high amount of oleic acid. Omega-7 and omega-9 fatty acids are also present. The leaves of the sea buckthorn tree are rich in minerals and bioactive compounds such as phytosterols, carotenoids, free and esterified sterols, triterpenols, and isoprenols. Proteins make up around 15% to 20% of it. The flavonoid concentration in leaves ranges from 312-2100 mg/100g of air dried leaves; it is a beneficial element in animal feed, a medicinal agent with antiviral action against a broad spectrum of viruses, and may be utilised as a source of unorthodox protein for human body.

Seabuckthorn has medicinal benefits for treating heart conditions. Flavonoids lower cholesterol levels, improve cardiac health, and treat conditions like cancer, sluggish digestion, stomach malfunction, neoplasia, thrombosis, hepatic injury, tendon and ligament injuries, oral mucositis, vaginal mucositis, cervical erosion, duodenal ulcers, and skin ulcers. Additionally, the seabuckthorn is used in the cosmetic sector. Seabuckthorn is used to make a variety of value-added goods, including a beverage, herbal tea, oil capsule, jam, herbal antioxidant supplement, and UV protection oil and cream.