



## **SEA BUCKTHORN A SUPER FRUIT : A REVIEW ON IT'S PHARMACOLOGICAL CHARACTERISTICS**

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### **ABSTRACT:**

Seabuckthron it is a plant, which are ecological and economic important plant of Himalyan Ladakh. seabuckthron it is a Hardy plant which grow in temperature 43°C to 40°C berries of seabuckthron are more Nutritional in the all fruits seabuckthron medicinal value is recorded is gro ded in early the 8th century in the Tibetan Medicinal classle. It is Grows naturally in ladakh without any Human interference. beery collection an important income generating to people. The period of collection. Is short and return is High. seabuckthron popularity as a source is income to be Judged by the appreciation in price of the fresh berry from. 8 kg in year 2001 RS 45 kg in 2017. The demand of the Seabuckthoen is more to supply capacity of the region it is tainable development of trans - Himaly an ladakh.

Ladakh are the major production of Naturally seabuckthron growing resource are 70% of total area. (13, 000 Ha) under seabuckthron then is less than 5% of total available of seabuckthron than resource in the region.



Keywords: Seabuckthron, Antioxidant, Berry, Biological Activity, Food, Medicinal fatty acid, vitamin c.

### **Introduction:**

It is found in Heights of Frozen of Himalya, it is thorny plant. species which is the europe Found in and asia. The pioneer species prefers to the growth in Humid soil, wet lands, river Side area with rusty brown scale.[1]

It is growing in the asia in altitude High ranging to few Meteresto 5200.[2]

Seabuckthron are growing fast species Multipurpose, biodiversity of measure soil conservation. Binding capacity of a soil Are useful to fertilization of soil, water retension, river bank Control [3] berries of Seabuckthron are very High Nutritional value. The Seabuckthron fruit is contain. 60-80 % Juice, it Mostly contain the vit.C .it contain 200-1500 Mg /100 g /which is five to Hundared times more than. any fruit or vegetables. ( Ahmad, kamal 2002) The beery of Seabuckthron then is used to raw material to processing of food, cosmetic, and Medicines. The plant of the Seabuckthron is source of the Firewood. The plant of the seab uck thron is High soil binding capacity, quick surface cover nitrogen fixing. Seabuckthron plant shows significant value of fuel fodder, food, and Medcinal plant. [4]

Seabuckthron uses they input Cost is very leas and watch full planing can lead to more production benefit. they are good preservative development sustainable, unique option for severel of Management problems, fragility, Non conformity, Isolation and diversity Mountain characterising areas.

Ultimate Measure & successfully technology are the effective the R and D institation, adopted by formers and industries are given model economical and ecological values of seabuckthron, on soilerosion prone marginal as High, High rates, soil loss causing frequent closure river based

Power Station in the region Strenger conditions of Stake Holders be promoted as way of the developing Markets. A value of chain of seabuckthron food expected to impact positively not only are income generation but they are also ensuring nutritional security of the consumers.

Model Has been worked out of the seabuckthron, They can replicated large scale development by Governmental and Governmental agencies in other seabuckthron growing areas. approach to link up the entire value chain through appropriation interventions in form productions, assured plant produces leading to food and vesterinary products, and development of market stragegies and policy related of the seabuckthron. popularization and utillization of seabuckthron food and Health products on Hand will be Help in. improvement of Health of common man seabuckthron is very rich in varity of vit. c on the others Hand in will the help in better returen to grows.

It used as traditional of seabuckthron include Fencing of field crops , shelding fruits, tree & timber plants, fuel, wood production and forage for livestock, However, local people had never thought of planting seabuckthron on large to play in Social economical the vital development of poor mountain communities. India Sbt recived much attension after (DIHAR) had developed and perfected the technolgy of cummer cilised production of beverages from. Highly acidic fruits. potential of the lesser-known shrub has been recognised by many R & D orgnization DRDo pioneered the SBT research in india and several R and D projects on SBT early nineties in recent year of Nurabers of research intitue in india are working on the lesser-knownshrubs.[5]

### ***Nutritional Attributes***

Berries of seabuckthron are the Most Nutritional in the all fruits. it contain organic acid, sugar, amino acid, essential fatty acid, flavonoids, Vitamin and mineral elements. The berries of Seabuckthron than across the plants world to meet the require ments dietary in Human population. vit. C Juice also contain the Vit.A ,vit. E, niacin, pantothenic acid vit,B6 and vit B2. They are concentrations of vitamins B2, B3 B5, B6, B12, C and E Higher than other fruits such as. apricot, banana , Mango, orange, peach. They are presence & these vit in High quantity of indicates, strong antioxidant property. itis aich in the varios amine. acid 118 kinds of free amino Acid.



Have been detected in Juice of the which eight are essential For Human body. The seed of the seabuckthron. is a source of valueavle oil in High olic acid and content and are and ratio of omega, 3 omega 6- Fatty acids. it also Contain omega -7 and omega 9 fatty acids.

The leaves of seabuckthron contain more nutrient & Bioactive substances and such as carotenoids and esterified steroles, Iso prenols, triterpenols. approximately 15-20 %. flavonoids, proteins the leaves are ranges from 312 - 2100 Mg of air dried leaves.

it serves as a valuable ingredient in animal feed, antiviral activity, against a wide spectrum viruses used as the unconventional protein For the Human body.

### ***Colour of Juice***

The colour of seabuckthron Juice is yellow. it contain the High amount of the carotene. it is responsible for the yellow colour of the coloration pigments are the present in the contributions of the colours,

clumps or Granule are embeded in the Juice, actually the Material

containing spherical droplets that's are yellow Brown in colour

(Beverage and harrison,2001.)

### Chemistry of Juice

Composition of the Seabuckthorn berries varies with the climate, origin and method of extraction. It is obtained to centrifugal procedures is about 67 % (Helischer & Lorber, 1996), Indian summer juice gives and pH of the average 3:13, titratable acidity of 1.97 % calculated as malic acid.

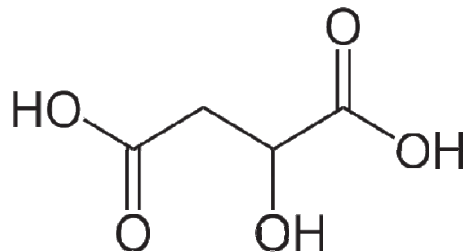


Fig. Malic Acid

### Amino acid

Seabuckthorn is rich in various free amino acids (1988) detected in those, shows 18 kinds of free amino acids in the Chinese seabuckthorn. That eight free amino acids like the (valine, threonine, methionine, leucine, lysine, tryptophan, isoleucine, and phenylalanine) are essential for the human body.

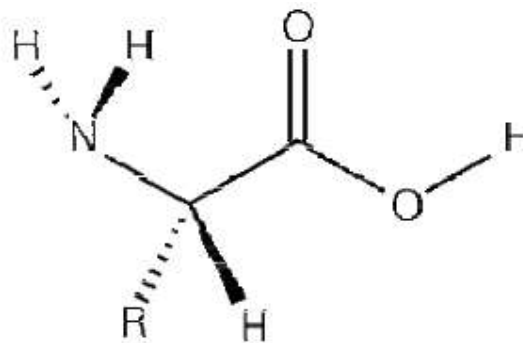


Fig. Amino Acid

### Seabuckthorn oil

Vitamin E content in seabuckthorn oil depends on the oil source, derived from the seed oil (64.4-92.7 mg/100g of seed. The juice oil 216 mg/100g of berries). Normally, pulp also contains vit. E. Variation of large amounts that are nutrients. With the origin or offer attractive prospects for breeding work. [6]

### Composition and Nutritional value of seabuckthorn [7]

Nutrients	per 100 g
carbohydrates	5 g
protein	1 g
Fat	2 g

moisture	91 g
croude fibre	0.5 g
vitamin c	909 mg
vitamin A	1500 mg
Vitamin E	3 mg
sodium	6 mg
potassium	420 mg




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### Healthy benefits of seabuckthron

- **Use in liver disease:**

Demonstrated in the clinical trial, extract of the seabuckthron helped to normal liver enzymes in liver inflammation and degeneration.[8]

- **Dairy products :**

The ingredient of the seabuckthron are used in dairy product likekefir, yogurt, or cheese, seabuckthron have antioxidant properties to fermented drinking beverages. [9]

- **Ecological uses :**

seabuckthron have unique biological features. seabuckthron Maintains the ecological of the Himalya environment. ability of the propagating of strong root system. Fixing capacity of nitrogen, at 8-10. year of the old seabuckthron can Fix the 180 kg of Nitrogenhector in year [10]

- **For Skin, Hair and Health.**

#### Skin

- |                        |                        |
|------------------------|------------------------|
| 1) skin regeneration   | 2) Reduce inflammation |
| 3) Promotes elasticity | 4) Remove toxins       |

**Hair**

- |                              |                         |
|------------------------------|-------------------------|
| 1) Regenerates damaged Hair  | 2) Restore elasticity   |
| 3) increases smoothness.     | 4) inihhibits Hair loss |
| 5) strengthens of Hair fiber |                         |

**Health**

- Fights Free radical damage in body.
- protects against diabetes.
- 3) promotes Heart health.
- 4) Boosts immune System.
- 5) supports Healthy liver[11]

**Skin -**

Seabuckthoon have multiple benefits of the skin, They are protecting and revitalizing of the skin. They are boosting collagen levels in the skih by inflammation reducing causing by UV exposure and sun damage, help alleviate skin dryness and Helped from Skin. Bedsores. It is reach in omega 3 & 6 fatty acide , it is helped to elasticity boost of the skin early signs agacing consumption proporation like a seabuckthron tea are the rid your systeam of toxins and Maintain Help skin integrity of skin. Topically seabuckthron work as hydrating strong agent for dry skin.

**Hair -**

It is common ingredient found in shampoo, Hair supplement conditioners. it is effective for making Hair healthier and apperance inalleviating issues. Hairstylists using the regenerative properties of seabuckthron for a treatment of Damaged Hair. it is restore elasticit which is necessary give your Hair body Curl retension. it makesrough and Coarse Hair textures smoother. folates presence and biotin contribute for stronger Hair they inhibit Hair loss. The oxidative effect are Help revers ageing sigh in your delying greying Health and loss of texture.

**Health -**

- **promotes tean & health –**

seabuckthaen present the antioxidants, manage to the blood clots,blood pressure and blood cholesterol levels .

- **protects against diabetes -**

consumption of the seabuckthron Help to reduce blood sugar levelincreasing insulin secretion. seabuckthronen manage blood sugar spikes caused by a carb-richmeal.

- **Help to support to Healthy liver -**

it reach in compounds like healthy fat vit. E and carotenoidas, whichprotect against damage to Healthy liver cells.

- **Helps boost the immune system -**

it is rich in flavonoids in ca n increas illness resistance the systemhelp boost natural immune Function of the body.

- **Help improve digestion -**

Daily uses of seabuckthron was improve digestion Function of body,keeping many aspects the Health check. [11]

- **Wound Healing**

In a clinical trial 151 burn patients, soaking their bandages withseabuckthron increased relief and sped up skin. regrowth around thewound. wound size & is decreased and increase in the production ofwound healing protens, injected seabuckthrons improved and recover tendon injuries, Fiber alignment and collagen deposition.

It is promotes Wound Healing to dermal to increasing antioxidant and protect superoxide, Mustard gas injury, strength of tendon Healing credited enhance to Collagen Maturation altered cytokine profile in the wound seabuckthorn seed oil significant oxidative Stress, Maintain blood brain barrier integrity, restricted in plasma catecholamine and significant enhanced the hypoxic tolerance in animals exposed to hypoxia, indicating, it's adaptogenic activity against hypoxia

- **Reducing the risk of heart Disease**

in a trial 23 Healthy people, it extract lowered fat blood Level after a meal. It is High fiber and polyphenol content responsible for this effect. In the rats feeding a high sugar diet extract lowered blood pressure and reduced heart damage to its antioxidant activity.

- **Immunity Boost :**

seabuckthorn is a boosted chicks immune system and decreased effect & toxin that suppress the immune system, seabuckthorn oils are increased natural killer cell counts and activity in rats subjected to chronic disease. [12] & [17]

### Side effect and precautions

There are some few side effects of the seabuckthorn oil some bleeding problems, inflammation Heart trouble

- **Surgery**

you are going surgery, avoid the uses of Seabuckthorn. oil before and after procedures. The nature of seabuckthorn. And anticoagulant nature of the oil and complication and Healing.

- **Blood pressure**

Blood pressure lowering. is a usually good thing but some cases of seabuckthorn oil, you are already using hypertension medication. the combination can some times. result in dangerously, in because blood pressure level is low. [13]

- **Pregnancy and Lactation.**

There are some "Feeding Women", no study conducted pregnant and breast feeding women. to use the seabuckthorn oil or its extract need to consider to health care professional you want to try it.

- **Children**

Consumption of any supplement is restricted to limit of Consumption. children are possibly safe to use but lower in dose than. as compared to the adult.

- **Bleeding Disorder**

Seabuckthorn is important blood clotting and Healthy to the blood Flow in the body [14]

- **Skin irritation**

seabuckthorn oil are potent oil. sensitive skin of people cause experimental topical inflammation, and redness or itching [15]

### Income generation and Local entrepreneurs

Seabuckthorn has received increasing attention after defence institute. of Altitude Research (DRDO) has developed technology preparing beverage of Seabuckthorn Highly acidic fruit.

They are available in Indian market under the brand name of (Ley berry, Ladakh berry, power berry) Herbal tea of seabuckthorn are prepared from Himalayan herbs with leaves of the seabuckthorn in the main ingredient found wide acceptance among consumer.

The seabuckthorn fruit worth Rs - 1.4 crore has been sold in 2007 From Leh district of Ladakh region. they generate employment and income to local people. [16]

### Pharmacological account of seabuckthron MechanismAnti cancer

Major constituents include quercetin induced apoptosis in cancer cells like Human colon cancer & HL-60 and K562 Human leukaemia cells prostate in cancer cell seabuckthron Juice inhibits growth of Human gastric carcinoma (SGC7901) and lymphatic leukemia (L1200) but kills both 5180 and D3P88 cancer cell).

It is able to decrease carcinogen stomach and skin tumorigenesis involve upgradation of phase II and antioxidant enzyme. As well as DNA-binding capacity. seabuckthron Juice block the endogenous formation velocity of N-Nitroso compound effectively of ascorbic acid prevent tumor production. [18]

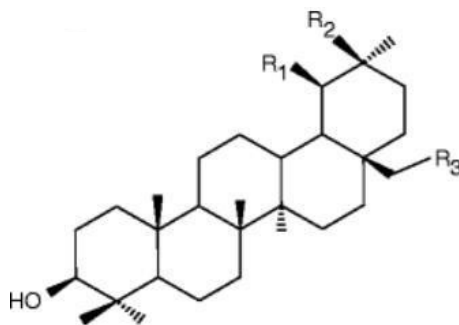


Fig. N-Nitroso Structure of Seabuckthron

### Cardiac effect

improve the Mecanocardiography ischemic electrocardiogram internal pressure peak of the left ventricles and maximum rate of change (dp/dt max) time from left ventricle starting the concentration. Ocurrence of (dp/dt max) Sharded 4 distinctly distolic pressure of the left ventricular pressure relaxation phase was diminished, cardiac

output cardiac index, Heart stroke index., left ventricular index of Myocardium increased. [19]

### ANTY HYPERTENSIVE EFFECT

The TFH is effective in decreasing concentration of intracellular free calcium induced by angiotensin-2 in smooth muscle cell by blocking receptor operated calcium channel receptor on cell surface and arrest downstream signal pathway High sodium diet can be ameliorated - 2 provoked. Total flavones purified from seed residues best effect was shown at the dose 150 mg/kg/day. [20]

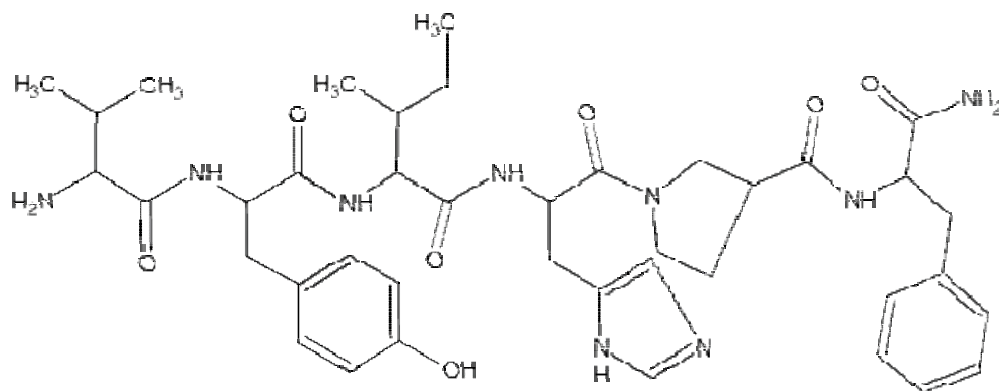


Fig. angiotensin-2 Structure

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