



Authenticity identification of active ingredients of berries and related products in China

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CONTENT

- ❑ **General situation of berry market in China**
- ❑ **Active ingredients, authenticity identification, and processing technology from berry**
- ❑ **Berry-based products for market**
- ❑ **Important berry enterprises in China**



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1. General situation of berries in China



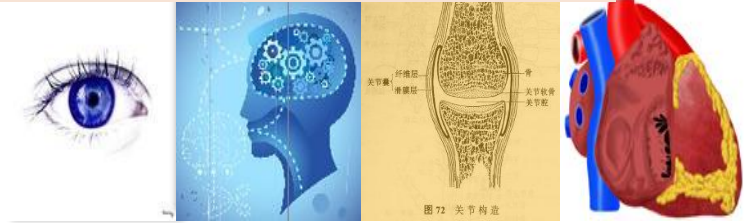
Vaccinium uliginosum



Hippophae rhamnoides L.

Why do we focus on berries ?

①Healthcare values



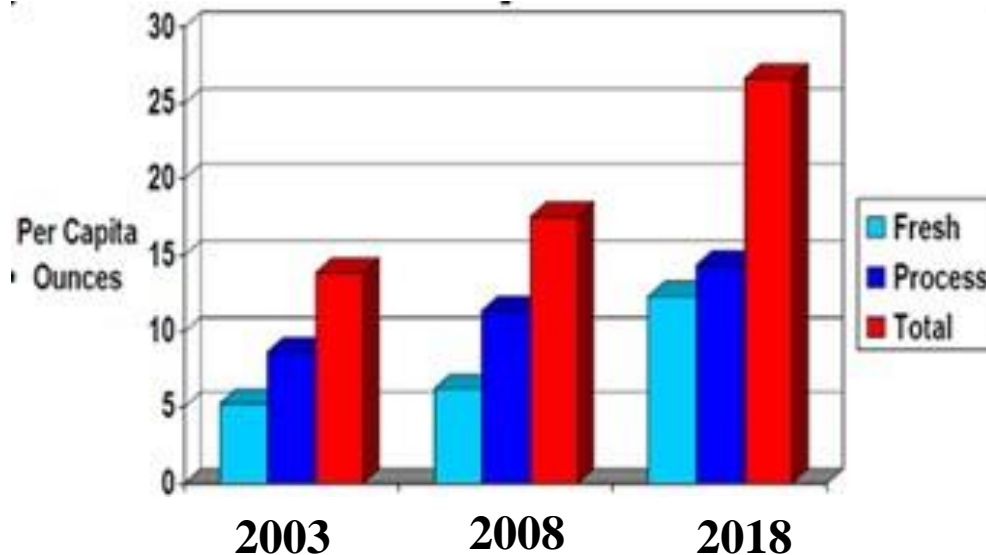
Protect capillary and possess antioxidant properties.

Delay aging process and improve memory.

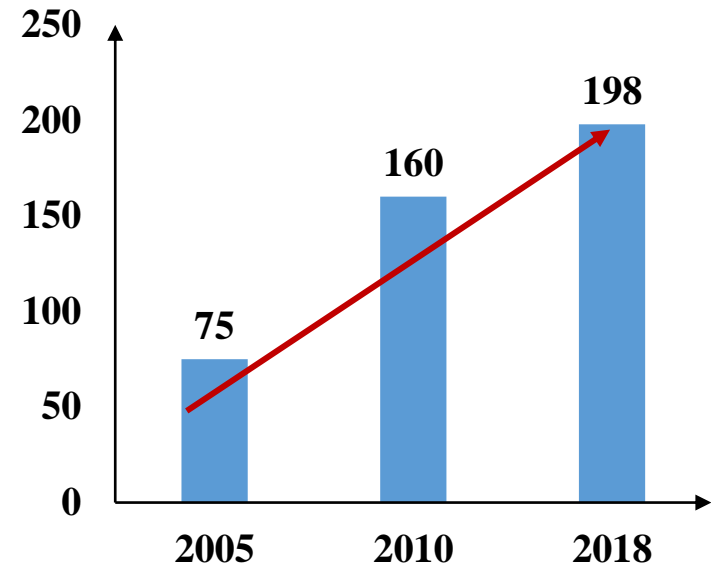
Remove free radicals and prevent cancer.

Have strong inhibition on enzyme activity related to occurring of cardiovascular diseases.

② Berries consumption is successive incremental



③ An increase in new product development?



Novel products going to market each year

High value, Large market, Great demand

Berry --- Seabuckthorn

Distribution Regions

Northwest

Gansu, Xinjiang, Qinghai

North part of China

Shanxi, Hebei, Neimenggu, Liaoning

Southwest

Sichuan



China is the country with the most abundant seabuckthorn resources, with a total area of 1.2 million ha, accounting for more than 90% of the world's sea-buckthorn total production.

Varieties & Output

Main seabuckthorn-growing varieties

**Output:
20 tons/hm²**

Hippophae rhamnoides
ssp. *Monglica*
'Shenqiuhong'



**Output:
17 tons/hm²**

Hippophae rhamnoides
ssp. *Monglica*
'Zhuangyuanhuang'



**Output:
15 tons/hm²**

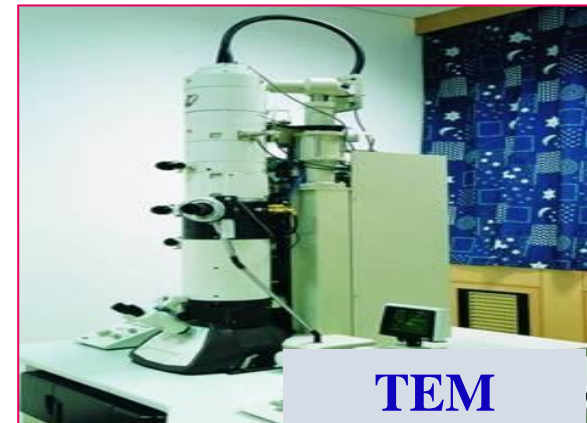
Hippophae rhamnoides
ssp. *Monglica*
'Zhudanhong'





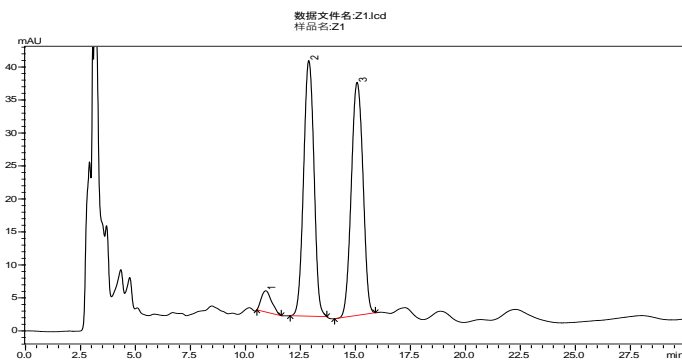
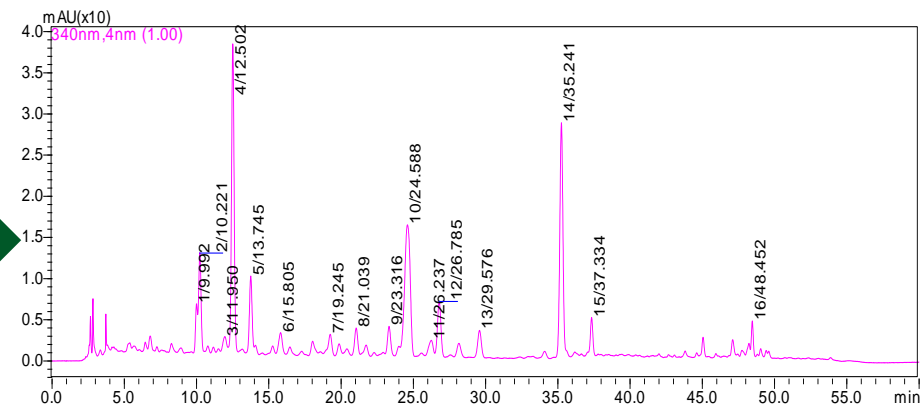
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2. Identification of active ingredients, and processing technology



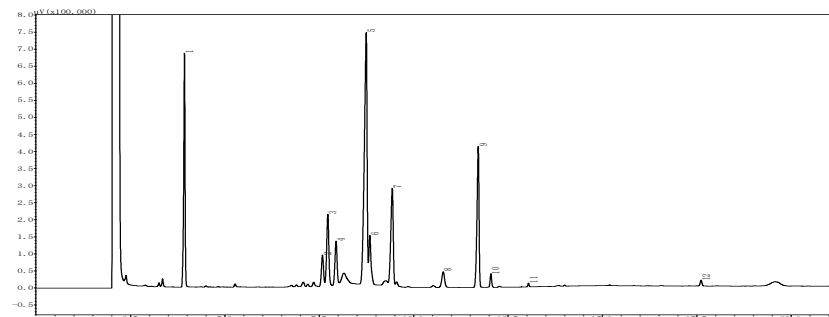


Active Ingredients of Seabuckthorn



Tocopherol in seabuckthorn oil

Flavonoids TIC



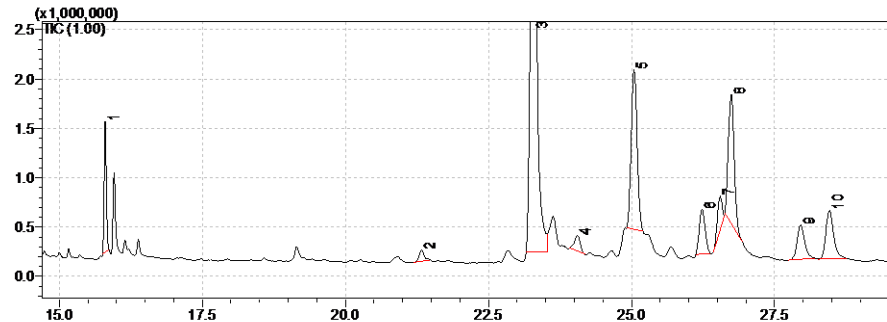
Organic acids and carbohydrate



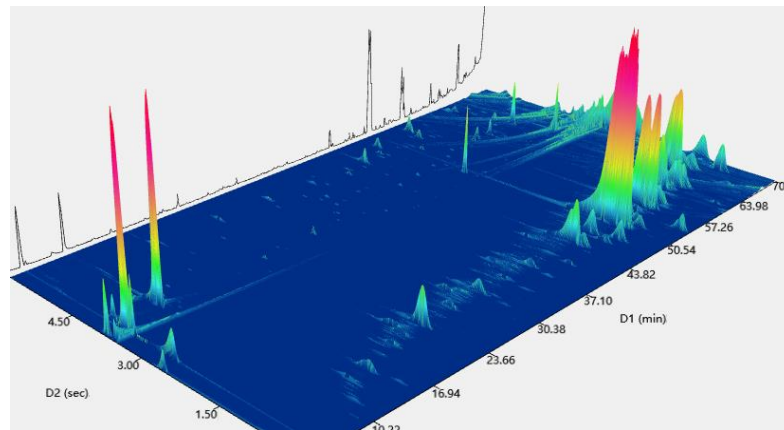
Authenticity identification of Seabuckthorn

Sterols constitute

GC/MS integrated with GC×GC/MS



Sterols of Oil by GC/MS



Sterols of Oil by GC×GC/MS



Technology for extracting and purifying active compounds

- **Supercritical fluid technology**
- **Macroporous resin adsorption refinery technology**
- **Bioengineering technology**
- **Membrane separation technology**



Supercritical fluid line from our industrial partner (Yuhangren)



our partner powders separation shop



Berry-based products for market

Seabuckthorn Seed Oil



106 bioactive compounds:

- ❑ 14 fatty acids, almost 90% unsaturated fatty acids;
- ❑ A rare source of vitamin E, and Vitamins A, C, D, and K;
- ❑ Carotenoids, flavonoids, phytosterols.

Possible potentials:

- ❑ Maintaining healthy cholesterol profile;
- ❑ Softening blood vessel, and reducing blood fat;
- ❑ Improving immune system;
- ❑ Promoting circulation and natural healing.

Seabuckthorn seed oil is always used as active ingredient for **pro-health foods, medicine, skin care products** and **cosmetics**.



Berry-based products for market

- ❑ **Seabuckthorn pulp oil** contains a high level of beta-carotene, which is the most active form of Vitamin A for healthy retinas.
- ❑ Providing abundant amino acids, natural Vitamin E and phytosterols.

Possible potentials:

- ❑ Having a powerful anti-oxidant effect;
- ❑ protecting mucus membranes of stomach;
- ❑ providing pro-vitamin A for eye health;
- ❑ Maintaining skin health.

Seabuckthorn Pulp Oil



Seabuckthorn pulp oil is often supplemented to **medicine** and **health foods**, and especially **cosmetic formulations instead of other plant oils**.



Berry-based products for market

Seabuckthorn Products

50,000 bottles of Yuhangren V9 seabuckthorn juice drinks



Yuhangren V9 seabuckthorn juice drinks

Directly, **seabuckthorn berries** are processed to concentrated–juice products for **long distance transportation and storage**.

The products:

- 1 is yellow brown color
- 2 has characteristic
- 3 During the epidemic of COVID-19
- 4 contain rich carot
- 5 minimal and amin

Within **2 minutes**

Sold out !

The concentrated s
be used to produce **soft drink, functional drink (juice or beverages), flavor and other foods**.



Berry-based products for market

Seabuckthorn Juice Powder



Seabuckthorn juice powder is made from fresh Seabuckthorn juice by spray-dry. It contains rich bioactive elements.

Possible potentials:

- natural anti-oxidant;
- easy to store and transport,;
- good material for making foodstuff and beverage.

Seabuckthorn juice powder can be used to produce **candy, drink, Chinese traditional medicine and flavors.**



Berry-based products for market

Seabuckthorn Seed Flavone



Seabuckthorn seed flavone is brown color with characteristic odor of seabuckthorn.

Possible potentials:

- an excellent source of anti-oxidant and anti-aging compounds;
- enhance the immune system, reduce blood fatty, improve vessel strength and increase cardiovascular and brain circulation.

Seabuckthorn flavone is ideal in the aspects of **medicine** and **health-care food**.



Berry-based products for market

Seabuckthorn Concrete



Seabuckthorn Tea



- **Seabuckthorn concrete** can be used to produce **Chinese traditional medicine**, **tabaco** and **food**.
- **Seabuckthorn tea** use seabuckthorn leaves as raw materia. It contains V_C , V_E , Terpene dilute acid, Flavonols, Chlorogenic Acid and SOD, etc. It is an ideal **alkaline drink** for human.



Chinese Partner



Seabuckthorn Development Management Center for Soil and Water Conservation, the Ministry of Water Resources, China

No.	Enterprises Name lists
1	Inner Mongolia Yuhangren Hi-Tech Industrial Co., Ltd
2	Beijing Powdery Health industry Co., Ltd
3	Gan Su Aikon Seabuckthorn Products Co., Ltd
...



INNER MONGOLIA YUANGREN HI-TECH INDUSTRIAL CO., LTD.

Yuhangren, established in 1995, one of the whole industrial chain group company which comprehensive utilizing in seabuckthorn plantation, research & development, production and processing.

- Applies its **supercritical fluid technology, bioengineering technology, membrane separation technology** and other high-tech means in the seabuckthorn industry.
- The industrial chain is gradually extended from **the ecological protection plantation to the deep processing of products.**
- Developed near **200 excellent products** in the fields of functional food, personal care products, health care food.

Focus on seabuckthorn for 30 years



JAS certificate, USA organic food (NOP) certificate, EU organic food certificate, China organic food certificate, Health care food GMP certificate, HACCP certificate, ISO9001.



日本有机农产品认证



美国有机食品认证



欧盟食品有机认证



保健品GMP认证



HACCP



伊斯兰认证



中国有机食品认证



ISO 9001管理体系

**Japan Food Testing and
Analysis Center**

**408 pesticide residue test
results: zero**



INNER MONGOLIA YUHANGREN HI-TECH INDUSTRIAL CO., LTD.

Yuhangren Seabuckthorn health care products



- Providing nutritional and healthy food ingredients and offering professional product strategies to China's healthy food industry.
- Powdery has established **3 growth bases** with a total area of 53,000 mu, **4 modernized production factory** and a **800 m² R&D center**.



Powdery



Supercritical CO₂ line

- Provide over **3,000 tons** of a wide array of foods and ingredients, including **Seabuckthorn extracts, oils, fruit and powders.**
- Quality control systems, comprehensive management and service systems, and modernized production capacity.
- Powdery one of the **largest food ingredient manufacture base in Asia.**



Line for manufacturing oral liquid



Line for manufacturing vegetable powders

DELICIOUS SEA-BUCKTHORN POWDER
美味果蔬沙棘果粉
口感好 / 品质如一 / 健康美味



**Seabuckthorn
powder**

沙棘果油粉

探索植物能量 发现健康之路
EXPLORE PLANT ENERGY AND FIND YOUR WAY TO HEALTH



**Seabuckthorn
pulp oil powder**

沙棘果油

来自大自然的馈赠



**Seabuckthorn
pulp oil**



**Seabuckthorn
seeds oil**

Conclusions

- ① China has **large demand** for seabuckthorn and other berries. **Seabuckthorn-based products are popular in China.**
- ② Research and development **for new products** has been industrialized, and we have established **technologies for identifying active substances** such as sterols for authenticity.
- ③ **Welcome** the partners with R&D and product development from Baltic nations to join us for exploring Chinese market.



Acknowledgements

- ① Seabuckthorn Development Management Center for Soil and Water Conservation, the Ministry of Water Resources, China
- ② Inner Mongolia Yuhangren Hi-Tech Industrial Co., Ltd
- ③ Beijing Powdery Health industry Co., Ltd
- ④ Beijing Key Laboratory of Forest Food Process and Safety for providing the experimental platform
- ⑤ Research teams by Dr. Zhang Bolin and Dr. Lv Zhaolin

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- We appreciate students and staffs from Beijing Forestry University for their contributions to these researches.

Beijing Forestry University



Thank you for your attention

we are really happy to see you in our institution after ending the COVID-19 various pandemic.