

# Blueberry

(In China)

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## Variety

There are 91 species of blueberry in China, mainly in Northeast China and Southwest China (mountain areas)

## Main species and their producing areas:

**1. *Vaccinium vitis idea* L.**

Producing from Liao Ning, Jilin, Hei-Long-Jiang Province and Inner Mongolia;

**2. *Vaccinium uliginosum* L.**

Producing from Liao Ning, Jilin, Hei-Long-Jiang Province and Inner Mongolia;

**3. *Vaccinium bracteatum* Thunb**

Producing from Jiang-su, Zhe-jiang, Jiang-xi, Hu-bei and Guang Dong Province.

**4. *Vaccinium oxycoccus* L.**

Producing from Da Xin An Mountain of Northeast China

## Functional constituents in blueberry

1. Vitamin E----anti-oxide, anti-geratology;
2. Flavonoids---help many diseases, bronchitis, cough, asthma, etc.
3. SOD ( Superoxide dismutase)----clean the free radicals from human body, anti-geratology and buildup the activity of skin cells
4. Minerals: Ca, Fe, Zn, P, Cu, Mg, ect., benefit to human body
- 5.Reducing sugar and organic acids-----healthy than sugar and
- 6..Natural colors-food, drink and cosmetic

## The value of blueberry as a edible fruit and raw material

**1. Fresh fruit**-good taste, delicious and rich in amino acids, vitamins, reducing sugar and many healthy minerals. In south China, such as Guang Dong, Guangxi, Jiangsu and Zhe Jiang, many people had eaten fresh blueberry traditionally.

**2. Use blueberry to process into** juice, concentrated juice, jelly, wine, jam, champagne, candy and others

### **3. Canned blueberry and frozen blueberry for trade**

#### **4. Good source of natural colors for food and drinks, and cosmetic.**

In Jiangsu and Zhe Jiang provinces, it is said that for over a thousand years, local people have been using the colors of blueberry to dye rice and then cook it. The cooked rice is purple, sweet-smelling, tasty and high nutritious. If one eat it everyday, he can blacken hair. There is a food company manufacture the product and apply a patent in China. The company's name is Kang-Fu Food & Drink Company in Li Yang, Jiangsu province.

## **The medicine value of blueberry and its constituents**

### **1. Flavonoids extracted from blueberry**

- a) Help the regeneration of erythropoietin;
- b) Help cough and asthma.
- c) Protect blood vessel
- d) Anti-ulceration, especially to gastric ulceration
- e) Improve micro-circulation of human body
- f) Anti-coagulation of blood platelets
- g) Anti-inflammation
- h) Anti-oxidation

It is useful to the patients of diabetes, scurvy, lithiasis, urology infection, arteriosclerosis, hypertension, gastroduodenal ulceration, myopia, nyctalopia and retinitis, etc..

### **2. Phenolic acids from blueberry**

Salicylic acid—anti-infection;

Catechu acid---help digestion

Gallic acid----constringency

Ursolic acid-----anti-microbiology and helpful to cure urethra disease (cystitis, ureter lithic, etc.)

Others----urethra infection, diarrhea, dyspepsia, etc

### **3. Vitamin E----anti-oxide, anti-geratology;**

4. **SOD ( Superoxide dismutase)**----clean the **free radical** from human body, anti-geratology and buildup the activity of skin cells

5. **Minerals:** Ca, Fe, Zn, P, Cu, Mg, ect.

## **Description in ancient Chinese medicine books**

In the year 968, the ancient medicine book *Kai Bao Herb* mentioned blueberry and its medicine value. Blueberry is rich reducing sugar, organic acids, vitamins and minerals, the fresh berry can be edible and selected to Chinese traditional medicine. . Herbalist doctors believe blueberry have the effects on strengthening physique, ginger and vigor

## **Chinese civilian application of blueberry**

### **1. Blueberry alcoholic drink, for strengthen body**

dry blueberry: 250 grams  
brown sugar: 30 grams  
rice wine: 500 grams  
Dipping in for ten days and then can drink.

### **2. Help dyspepsia, stomachache and diarrhea**

Fresh blueberry 15 grams each time, twice per day (morning and night)

### **3. Help recovery from tired and under-physique**

Blueberry mash 60 grams and 60 grams rice wine, mixing and then extract the liquid for oral in-take just before sleeping everyday.

### **4.Help rheumatism arthritis**

Blueberry-dipping wine, 30 to 60 ml each time, twice ( morning and evening) per day.

### **5. Help spermatorrhea**

Dry blueberry, baked to brown and sweet-smelling, add water to decoct 15-20 minutes, drink the extract before sleeping every evening.,

## Interesting facts

### \* Largest output of blueberry variety:

Number one: *Vaccinium vitis idaea* L.

Number two: *Vaccinium uliginosum* L.

These two blueberries are the largest output varieties with the largest growth area, mainly in the Da Xin An Mountain, Xiao Xin An Mountain and Chang Bai Mountain, among of them, Da Xin An Mountain is the number one producing area with 90 percent output of the national total production. Da Xin An Mountain, a famous primitive forest in China, extends from northeast China (Liaoning, Jilin and Hei-long-Jiang) to Inner Mongolia (Ya-Ke-Shi area). So the large amount of blueberry in China are managed by two forest administrations: Da Xin An Mountain Forest Administration of northeast and Ya-Ke-Shi Forest Administration of Inner Mongolia.

### \* Wild output and harvest output

Wild output of blueberry in Da-Xin-An Mountain may reach 100,000 MT per year, but small amount was harvested.

Harvest output in Da-Xin-An Mountain:

Total: 12,000 Mt

	V. vitis idaea	V. Uliginosum
Da-Xin-An Administration:	5,000 MT	3,000 MT
Ya-Ke-Shi Administration:	2,700 MT	1,300 MT

Generally speaking, the ratio of these two blueberries' output is 1.5 : 1. *Vaccinium vitis idaea* L. Is the number one species.

### \* Domestically processing:

There are many small-scale factories in those areas. Bei-Shi-Sheng Beverage Factory, the biggest one in Da-Xin-An Mountain Area, has a processing capacity of 40 Mt blueberry a year.

### \*Exportation

About 4,000 MT of blueberry a year.

Most are frozen by IQF (Individual Quick Frozen) or by cold room in harvest period and then take out to air in winter.(below  $-20^{\circ}\text{C}$ ).

### \*Price:

fresh berry in producing area, about US\$ 250 per ton

**\*Blueberry from Da Xin An Mountain is regarded as a green food,**

because it is far away from agriculture area, no fertilizer and pesticide. It is also remote from human activity.

**\*Vitamin E and SOD** are two active anti-decrepit compounds

Other fruits contain no or little  $V_E$  and SOD, so blueberry was regarded as the New Century fruit to China consumers.

Vitamin E content and SOD activities in fruits of blueberry (in fresh wt.)

Cultivars	Vitamin E (ug/g)	SOD
<b>Lowbush blueberry</b>		
7917	6.2	9.69
NB-3	9.5	9.69
Chignecto	5.6	5.39
Blomidon	6.3	20.77
<b>Half-highbush blueberry</b>		
Northsky	3.0	37.39
5415	2.7	52.62
5115	2.7	52.62
Northsky	3.9	48.46
North country	9.1	29.08
<b>Highbush blueberry</b>		
Patriot	3.7	55.39

**\*Inorganic element of blueberry fruits** (ug/g in dry wt.)

Cultivars	Al	Fe	Ca	Mg	Cu	La	Mn	P	Sr	Zn	Ba
<b>Lowbush blueberry</b>											
7917	4.4	14.0	520	114	2.0	0.2	6.0	152	2.0	3.3	2.0
NB-3	5.0	10.2	880	246	2.0	0.5	5.3	157	3.0	4.1	4.0
Chignecto	2.2	10.0	880	182	1.4	0.5	8.0	98	3.0	4.3	3.0
Blomidon	0.1	10.4	292	155	2.0	0.3	3.2	154	1.5	3.1	1.0
<b>Half-highbush blueberry</b>											
Northsky	6.0	23.8	920	246	2.0	0.4	10.6	334	3.6	4.3	4.0
5415	0.1	30.0	540	157	1.4	0.2	7.5	79	2.2	2.1	1.0
5115	4.0	15.0	360	249	2.4	0.3	1.2	477	1.2	3.4	1.0
Northsky	1.0	5.6	360	229	2.2	0.4	3.6	172	2.3	3.7	1.5
North country	2.0	7.6	340	157	2.0	0.2	0.8	274	1.8	3.0	1.0
<b>Highbush blueberry</b>											
Patriot	6.4	10.4	220	222	1.0	0.2	7.7	230	0.8	4.1	1.4

**\*Amino acid content of blueberry fruits** (percentage in dry wt.)

Cultivars	Total	Asp	Thr	Scr	Glu	Gly	Ala	Val
<b>7919</b>	1.420	0.156	0.046	0.054	0.291	0.095	0.117	0.109
<b>NB-3</b>	1.882	0.191	0.064	0.085	0.362	0.125	0.141	0.310
<b>Chignecto</b>	1.572	0.169	0.055	0.079	0.312	0.118	0.128	0.115
<b>Blomidon</b>	1.618	0.187	0.061	0.080	0.317	0.108	0.133	0.122
<b>Northsky</b>	1.728	0.199	0.059	0.078	0.360	0.114	0.140	0.127
<b>5415</b>	1.383	0.150	0.043	0.062	0.287	0.085	0.103	0.098
<b>5115</b>	1.085	0.121	0.040	0.045	0.197	0.071	0.093	0.089
<b>Northsky</b>	1.828	0.203	0.063	0.079	0.369	0.132	0.141	0.131
<b>Northcountry</b>	1.255	0.140	0.043	0.056	0.255	0.085	0.107	0.097
<b>Patriot</b>	2.549	0.296	0.094	0.116	0.540	0.166	0.199	0.178

(continue) **Amino acid content of blueberry fruits** (percentage in dry wt.)

Cultivars	Ile	Lcu	Tyr	Phc	Lys	His	Arg	Prc
<b>7919</b>	0.065	0.124	0.040	0.067	0.029	0.023	0.130	0.074
<b>NB-3</b>	0.079	0.243	0.049	0.086	0.046	0.033	0.165	0.082
<b>Chignecto</b>	0.071	0.129	0.052	0.071	0.035	0.025	0.137	0.076
<b>Blomidon</b>	0.073	0.139	0.047	0.071	0.037	0.040	0.122	0.081
<b>Northsky</b>	0.073	0.139	0.049	0.076	0.037	0.030	0.164	0.083
<b>5415</b>	0.060	0.114	0.048	0.065	0.027	0.035	0.144	0.062
<b>5115</b>	0.053	0.097	0.034	0.055	0.021	0.019	0.087	0.063
<b>Northsky</b>	0.082	0.162	0.054	0.100	0.035	0.040	0.152	0.085
<b>Northcountry</b>	0.058	0.107	0.037	0.058	0.025	0.022	0.106	0.059
<b>Patriot</b>	0.109	0.209	0.076	0.106	0.059	0.058	0.249	0.094

**Chinese Reference:** Blueberry

No.	Article name	Magzine, vol. and page
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2	Status and exploitation of the genetic resource of two species of blueberry in China	World Forestry Research, 1998(2), 64-69
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7	Studies of effect on anti-virus and anti-bacteria of blueberry flavonoid	ACTA Chinese Medicine And Pharmacology, 1992(5),46-47
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9	The resource and development of blueberry in Da Xin An Mountain	Quarterly of Forest By-Product and Speciality in China,95(3),42-
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12	Studies on dynamic change of nutritious constituents of blueberry juice	Food Science, 1992(6)26-28
13	Application of blueberry color in cosmetic	Fragrance, Flavor and Cosmetics, 94(1), 45-49
14	Experiment research on blueberry flavonoids to help cough and asthma	*

Note:

\* Master thesis