



Quality Should Never Compromise to Price



Introduction of Pine Pollen **From Yunnan Province belong to Himalayan Mountains** **TCM Adaptogen Warehouse**



TCM ADAPTOGEN WAREHOUSE Quality Should Never Compromise to Price

TCM Adaptogen Warehouse-a high-tech enterprise for researching and manufacturing natural ingredients **for around 10 years with 46,000.00 sqms areas, Agilent 1260 Infinity HPLC&SHIMADZU UV Visible Photometer dectectors,100,000 level purification workshop**, this is how we keep superior quality and competitive cooperation for global valued customers.

At TCM Adaptogen Warehouse, we are focused on providing Traditioanl Chinese Medicine extracts powders and other natural ingredients with the highest levels of customer satisfaction – we will do everything we can to meet clients' expectations. Our featured products include **horny goat weed (epimedium) extract(icariin), duanwood reishi mushroom extract, ginseng extract, chaga mushroom extract, tongkat ali root extract,nettle root extract, pine pollen** and other natural ingredients.

We bear advanced extraction, isolation, purification, synthesis, fermentation equipment and technology with rich production experience and strict quality control system, and we have built a sophiscated sale service system, products are exported to Europe, North and South America, Asia and other Oceanian countries with good reputation.

We believe that quality is the life of TCM Adaptogen Warehouse. All our products are manufactured strictly complied with ISO9001: 2000 quality management system during the whole entire production process. **"Quality Never Compromises to Price"** is core value of our enterprise to offer our customers the reliable products and services that they expect and deserve.



Pine Pollen Powder

Particle Size: 300 mesh

Appearance: Light yellow fine powder

Specification: Cell-broken ratio >98%; Protein >10%

Botanical Source: *Pinus Massoniana Lamb*

Features:

- * 100% natural selected by hand
- * Far from industrial contamination
- * No pesticide residue

Our cell broken pine pollen



finer particle, higher viscosity, weaker flowability and stronger smell.

Common pine pollen

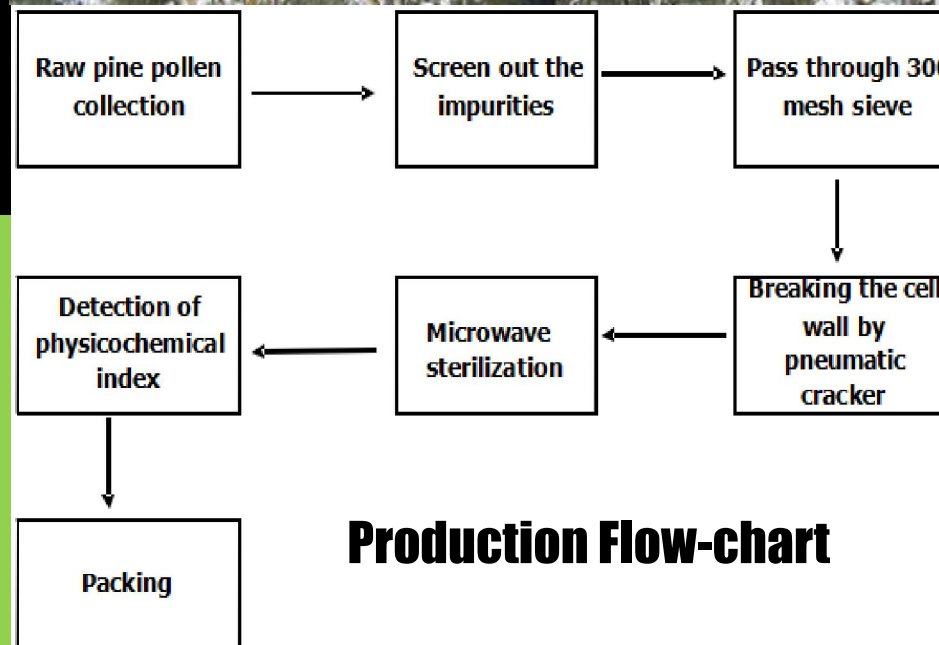


Rough particle, lower viscosity, higher flowability and weak smell.

Collection of raw pine pollen: Workers cut down the Ripe Pine Pollen Catkins from the pine tree by hand.

Microwave sterilization: dried and sterilized by Microwave drying sterilizer

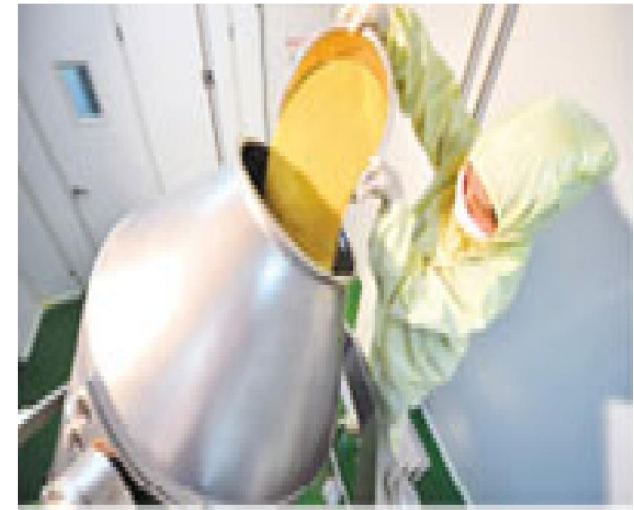
Breaking the cell wall: Since the nutrients of pine pollen is protected by hard cell wall which result in poor absorption of nutrition. By pneumatic cracker, the hard cell wall will be broken (ratio >98%) for a better consumption by human beings.



Production Flow-chart



Processing of Pine Pollen



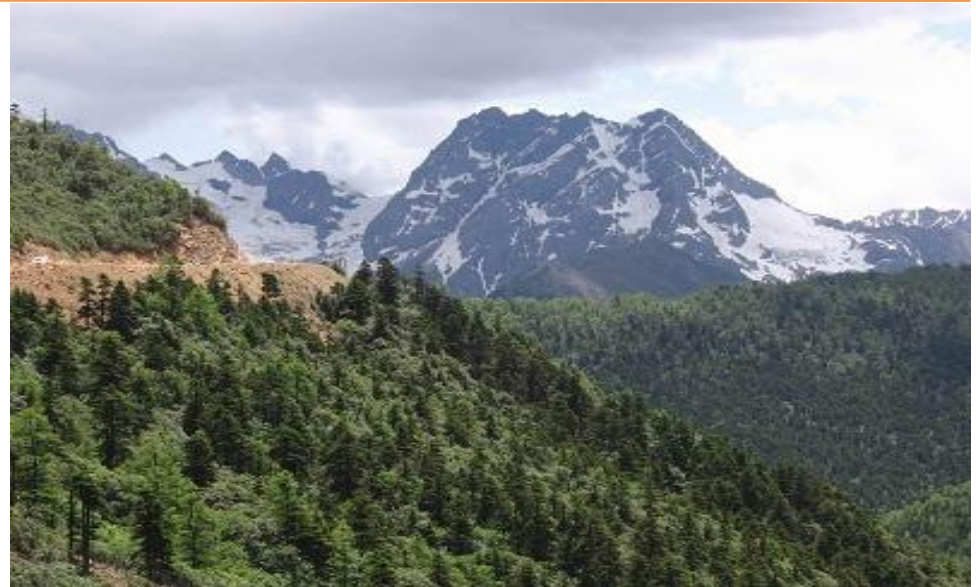


Source: Pinus massoniana grown in Yunnan Province belong to Himalayan Mountains

Our [Pine Pollen](#) is gathered in the Yunnan Province in Southwestern China--an area roughly 152,000 sq miles, with the northwestern region displaying impressive mountain ranges and river valleys--including the vast pine forests. This part of Yunnan is the Tibet Autonomous Zone and is the foot of the eastern most edge of the Himalayan Mountains. This is where our pine pollen is gathered once a year. The Yunnan Province is home to the richest plant life of all of China and has been a top destination for many naturalists from the US and Europe because of its natural beauty and diverse plant and animal life. Because of the geographic isolation and because of the geographic nature of the northwestern area of Yunnan, the forests where our pine pollen is harvested from is far from industry.

Why the Pine Pollen cell wall need to be broken?

[Pine Pollen](#) is surrounded by hard cell/shell which like an armour to protect the nutrition inside the cell wall. The cell wall of pine pollen can stay the same when soaked in caustic soda or in boiling water, as well as strong radioresistance character. A study conducted by a Japanese scholar on pine pollen by increasing the radiological dose on [Pine Pollen](#) and found that the cytoplasm dead volume is 77.4-129 C/KG while the human radiation lethal dose is only 0.15 C/KG; which can show that pine pollen cell wall has extraordinary strong stability and radioresistance character. Digestive juice of human or any monogastric animal can not break the [Pine Pollen](#) cell wall. Therefore, for better consumption of nutrition inside the cell wall, physical breaking of pine pollen cell wall is necessary.



Cell-broken process can help pine pollen nutrition absorption

Pollen grains are wrapped in the solid shell, which protects the nutrients and hereditary substance in it as an "armor". The pollen wall has a great capacity of not only with standing being soaked in caustic soda and boiled in water but also resisting radioactivity. Experiments made by Japanese scholars by increasing the radioactive dose shows that the lethal dose of radiation on human beings is 0.15 coulomb/kilogram whereas a dose of 77.4-129 coulomb/kilogram on pollen cells demonstrates the marvelous solidity and anti-radioactivity properties of the pollen shell.

It is originated in Japan that the digestive juice of human beings and monogastric animal can not break down the sporoderm of the pollen, thus the sporodem has to be removed before all the nutrients in pollen can be absorbed. However, European and American countries that have popularized pollen products hold that the pollen with a sporoderm or without a sporoderm can both be absorbed by the body. For many years, no agreement has been reached on this issue whether it is necessary or not to break the pollen sporoderm. This argument has captured the great attention of nutritionists. Many studies have been carried out on the sporoderm-breaking of pollen by experts at home and abroad as a scientific research subject.

Cell-broken process can help pine pollen nutrition absorption

The study on the microforms and nutrients has been made by the Trace Element Research Laboratory of the General Hospital of the PLA with an analytic comparison on the nutrients of natural pollen and sporoderm-broken pollen and a discussion has been provided on the effect of the sporoderm breaking on the pollen structure and nutrients after an observation on the changes of the microforms before and after the sporoderm is broken with the scanning electron microscope.

Pine pollen is a kind of faint yellow powder with a light texture easy to flow and a soft feel of lubricity. The fluid property of pine pollen can be perceived when a bottle with it is being shaken but the fluid properties are lost when its sporoderm is broken with the high speed airflow pulverization method causing the change on its physical properties, unable to flow due to the tremendous adhesiveness of the sporoderm-broken pine pollen.

The vesicae shed and separate themselves from the pollen grains under the mechanical force while they are crashing with one another under the force of the high speed airflow during the sporoderm-broken process. The main bodies of the sporoderm-broken pollen grains are relatively enriched due to the fact that the vesicae are easy to be carried by the high speed airflow for its special physical structure and get lost with the force of the airflow.

Appearance Comparison



原粉
raw pine pollen

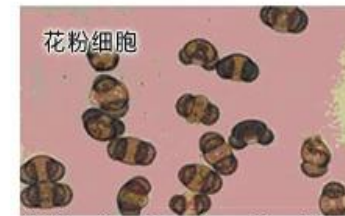
Golden yellow, stronger granular sensation, bitter



破壁粉
cell-wall
broken pine
pollen

Light yellow, smooth fine powder, bitter taste

Cell comparison under microscope



花粉细胞

Before breaking the cell wall



破壁后细胞

After breaking the cell wall



Comparison of our pine pollen with others

1. Our cell broken pine pollen powder

Most of our cell broken [Pine Pollen](#) suspend in water which is easier for consumption, with high cell broken ratio.

2. Pine pollen from other suppliers

Most of pine pollen float in water, less suspended and sedimentary substance in water, with low cell broken ratio.

3. Raw pine pollen

Float in water, seldom pine pollen powder dissolve in water, bad consumption for human.



Pine Pollen Certificate of Analysis

General Information			
Botanical Name:	<i>Pinus massoniana Lamb</i>	Herbal Part Used	Raw pollen
Batch #	TCM170825PE	Produce date	2017-08-25
Expiry Date	2019-08-24	Representative QTY	1000kg
Item	Specification	Method	Result
Physical Property			
Appearance	Fine Powder	Organoleptic	Conforms
Color	Light yellow	Organoleptic	Conforms
Odour	Characteristic	Organoleptic	Conforms
Mesh Size	100% pass 80 mesh size	USP32<786>	Conforms
General Analysis			
Identification	Identical to R.S. sample	HPLC	Conforms
Protein	10%	HPLC	Conforms
Loss on Drying	≤5.0%	Eur.Ph.6.0[2.8.17]	3.19%
Ash	≤5.0%	Eur.Ph.6.0[2.4.16]	3.40%
Contaminants			
Solvents Residue	Meet Eur.Ph6.0<5.4>	Eur.Ph 6.0<2.4.24>	Conforms
Pesticides Residue	Meet USP32<561>	USP32<561>	Conforms
Lead(Pb)	≤3.0mg/kg	Eur.Ph6.0<2.2.58>ICP-MS	2.1
Arsenic(As)	≤2.0mg/kg	Eur.Ph6.0<2.2.58>ICP-MS	1.6
Cadmium(Cd)	≤1.0mg/kg	Eur.Ph6.0<2.2.58>ICP-MS	0.7
Mercury(Hg)	≤0.1mg/kg	Eur.Ph6.0<2.2.58>ICP-MS	0.07
Microbiological			
Total Plate Count	≤1000cfu/g	USP30<61>	120
Yeast &Mold	≤100cfu/g	USP30<61>	40
E.Coli.	Negative	USP30<62>	Conforms
Salmonella	Negative	USP30<62>	Conforms
Shelf Life			
24 months under the conditions below, no antioxidant used			
Package&Storage			
Standard packed in fiber-drum and two plastic bags inside			
N.W: 25kgs. I.D. 35 x H51 cm;			
Store in a cool,dry place away from Moisture, Light, Oxygen			
Manufacturer			
TCM Adaptogen Warehouse Co., Limitd			

Pine Pollen Nutritional Analysis

According to the research, the nutritious components are categorized into five groups:

- (1) 20 kinds of amino acid, 8 of which are essential to the body.
- (2) 14 kinds of vitamins.
- (3) 30 kinds of mineral elements.
- (4) about a hundred kinds of enzymes and active substances.
- (5) nucleic acids, fibrins, unsaturated fatty acids, flavonoids, choline, etc.

Over 20 Amino Acids including all 8 Essential Amino Acids	Full Spectrum of Food Source Vitamins	A Complete Mineral Profile	Other Medicinal Compounds
Alanine	Vitamin A	Calcium	Rich in Plant Sterols
Arginine	B-Carotene	Copper	Nucleic Acids
Aspartic	Vitamin B1	Iron	Unsaturated Fatty Acids
Cysteine	Vitamin B2	Manganese	Oleic acid
Glutamic Acid	Vitamin B3	Magnesium	Alpha Linolenic Acid
Glycin	Vitamin B6	Molybdenum	Lignin
Isoleucine	Folic Acid	Phosphor	Methylsulfonylmethane (MSM)
Leucine	Vitamin D	Potassium	Fiber
Lysine	Vitamin E	Selenium	Living Enzymes & Co-Enzymes
Methionine		Silicon	Flavonoids
Phenylalanine		Sodium	Monosaccharides & Polysaccharides
Proline		Zinc	Superoxide dismutase
Serine			Antioxidants
Threonine			Androstenedione*
Tryptophan			Testosterone*
Tyrosine			Dehydroepiandrosterone (DHEA)*
Tyrosine			Androsterone*
			A Bio-available Phyto-Androgen

Benefits of Substances in Pine Pollen

Plant hormone in Pine Pollen

Pine Pollen is health food without any animal hormone, insect hormone, dope and toxic side-effects.

Plant hormones are natural organic compounds that can regulate plant growth and belong to the steroid or simple organic acid family. Despite the use of "hormone", they differ greatly from animal hormone in terms of the origin, biological synthesis, transmission process and effects in that it is just a growth factor for plants without any negative effect on the body.

Flavones in Pine Pollen

In phytochromes, bioflavonoids have a great amount in fruits and vegetables with colors. Pollen is the very part of the plant where pigments accumulate. Carotenoids and flavonoids are the most common plant pigments. Every 100g of pine pollen contains 29.26mg total flavonoids (rutin). Flavonoid has a lot of functions such as lowering blood pressure, reducing lipidemia, preventing thrombosis, strengthening immunity, improving cardiovascular and cerebrovascular blood circulation, etc. Flavonoid, similar to vitamin C, is metabolized quickly, and evacuated by urine when it is in surplus.

As far as scientists are concerned, flavonoid is a newly discovered natural nutrient necessary for the body. The lack of flavonoid in the body will lead to cerebral dysfunction, inadequate cardiac function, blood vessel cirrhosis and brittleness. With small molecules it is easily absorbed by the body and enter fat tissues through blood barriers; hence, it has a general effect for many health conditions, such as anti-inflammation, anti-allergy and anti-tumor, restraining bacteria and virus, and preventing liver diseases and thrombosis.

Flavonoid should be taken consistently. With a fast metabolism it does not accumulate in the body. Meanwhile, it has to be obtained from food, it can not be synthesized in the body.

Vitamins in Pine Pollen

The term of vitamin, meaning the element to preserve life, was first put forward by FUNK in 1912. Through constant researching, over 20 kinds of vitamins have been found out to be essential to the body. Vitamin can be divided into water-soluble vitamin (vitamin B family and vitamin C) and fat-soluble vitamin (vitamin A, β -carotene, vitamin D, vitamin E and vitamin K). Vitamin is an organic compound essential for maintaining the natural physiological functions of the body. They can not be synthesized in the body (or little is synthesized) and must be taken from the food. Each kind of vitamin has its own physiological function and can not be substituted. The body needs quite a small amount of them but they are absolutely indispensable.

The vitamins in the pine pollen exist in a biologically natural form in the cells, with full bioactivity and good absorptivity. They work together in the body. For example, vitamin A, C and E protect one another from being oxidized, and best effect will be obtained when they supplement each other; Vitamin B, B2 and B6 must be supplemented in the proportion of 1:1:1; Vitamin E and selenium supplement each other; Vitamin C can help the absorption of iron; Vitamin D helps the absorption of calcium. The absorption of the nutrients is a complicated process and more absorption does not mean better effect.

Benefits of Substances in Pine Pollen

Minerals in Pine Pollen

Minerals are the inorganic components in the body. It can be divided into constant-element and trace element according to the content of them in the body. Constant-elements in the pine pollen are: potassium, sodium, calcium, magnesium, phosphor, silicon, etc. Trace elements are: iron, zinc, selenium, manganese, molybdenum, etc. Each mineral in the body has its own physiological function. They can keep the acid-base balance in the body fluid. They are components and activators of many enzymes. The minerals in the pine pollen exist in the natural plants in the form of naturally biological form, with the characteristics of good absorptivity and no toxic side effect. Meanwhile, some mineral elements in pine pollen work with vitamins to keep the balance of the micronutrients in the body.

Amino acid in Pine Pollen

Amino acid, whose physiological function is to synthesize protein, is the fundamental unit of protein, which is the physical basis for life. It can maintain the nitrogen equilibrium and is the raw material for different enzymes, antibodies and some hormones and can also regulate their physiological functions. It provides heat energy for the body, promotes growth, replenishes the metabolic consumption, and maintains the normal osmotic pressure of capillary. Amino acids can be divided into essential amino acid and non-essential amino acid according to their nutrient value.

Under proper condition, the body can synthesize some kinds of amino acid and eight kinds of them have to be provided by foodstuffs. The eight kinds of amino acid are essential to the body, so they are called essential amino acids which fulfill an important physiological functions on the body. These eight kinds of essential amino acid are: isoleucine, leucine, lysine, methionine, tryptophan, threonine, phenylalanine and valine. Children also need histidine.

The body needs a certain amount of each essential amino acid and they can only be fully utilized with a corresponding proportional pattern. WHO has laid down the standard for that and the food whose proportion of the essential amino acids meets the standard is considered highly nutritious. Pine pollen is basically up to the standard.

Enzymes in Pine Pollen

Enzymes, formerly called "ferments", are complicated proteins with catalytic functions. Its catalytic capacity is regarded as the viability of enzymes. They are characterized by their high specificity. Nearly all the chemical changes of the organism take place under the catalysis of the enzymes. Enzymes have high catalytic efficiency, for one enzyme molecule catalyzes hundreds to millions of substrate molecules in one minute. Enzymes are usually named after their substrate or the characteristics of their functions. For example, amylase acts on the amylum, chymosin promotes the coagulation of milk, and glucose oxidase catalyzes the oxidation of glucose. Enzymes are also of great significance to the cure and diagnose of diseases, to the understanding of the nature of biological phenomenon as well as to the industrial and agricultural production.

Coenzymes are the small non-protein organic molecules essential for the catalysis of the enzymes. Most coenzymes are the derivatives of vitamins, for example, vitamin B12 participates in some physiological functions in the form of coenzyme. Pine Pollen naturally contains nearly a hundred kinds of enzymes needed by the body. They can promote the peristalsis of stomach and intestines, whet the appetite, regulate the assimilating function of the body and promote digestion and absorption. It has a good repairing effect on the gastric ulcer, duodenitis, atrophic gastritis, etc. It can regulate the immune system and endocrine system of the body. Having various kinds of natural enzymes and coenzymes as its major component is the prominent feature of the pine pollen among other health foods.

Benefits of Substances in Pine Pollen

Dietary fiber in Pine Pollen

Cellulose is a polysaccharide made with repeated glucose units bonded together and the major component of the plant's cell wall. The cellulose in the pine pollen is the major component of inner and outer wall of pine pollen's microspore. It is always attached to the lignin, semicellulose, pectin, etc., with the content up to 29%. The content of lignin is especially high, which is of great significance to the digestive function of the body.

In the past twenty years, after an in-depth research, medical experts and nutritionists have confirmed the nutrient value of dietary fiber and list it the seventh nutritious elements in the world. In recent years, FAO, U.S., Canada, Japan, China and other countries all have mentioned in authoritative works that dietary fiber is one of the essential nutrients for the balance of the diet structure.

The effects of dietary fiber in pine pollen are:

- (1) Preventing colonic cancer. Colonic cancer is caused by the long stay of certain excitants or poisons in the colon. If the content of the cellulose in the food is too low, the long-stay of harmful substances in intestines will poison the intestine wall. Gradually, it will induce colon cancer. In the case of a higher content of dietary fiber, the cellulose that enters the large intestine will be selectively decomposed and fermented by the inner cells and this accelerates the mass reproduction of beneficial bacteria (diplococcus and lactobacillus), meanwhile, it stimulates the intestine mucosa, quickens the excretion of feces and normalizes the intestine function.
- (2) Preventing coronary heart disease. The dietary fiber is effective in preventing and improving heart disease caused by coronary arteriosclerosis. That's because, the cellulose can restrain or postpone the absorption of cholesterol and glyceride in lymph by certain action. With normal diet, prevention and cure of coronary arteriosclerosis and heart disease can be achieved by the proper increase of the dietary fiber intake and decrease of the fat intake, which will reduce the level of cholesterol in the body.
- (3) Regulating the blood sugar level of diabetics. Inadequate intake of the dietary fiber is one of the major causes for the high incidence of diabetes. The blood sugar level can be regulated by increasing the content of dietary fiber in the food, which will improve the sensitivity of ending tissues to the insulin.
- (4) Bringing about the early feeling of repletion of the stomach, reduce foodstuff intake and prevent adiposity. It has a good effect on weight-losing for the obese.
- (5) Reducing the intake of bile acid, change the speed of assimilation of food and the secretion amount of the digestive juice. It can prevent cholecystolithiasis, duodenitis, hemorrhoids, ulcerative colitis, large intestine cancer and other diseases.

Nucleic acids in Pine Pollen

Nucleic acids are the most important components of biological cells. They fall into two kinds: ribonucleic acid (RNA) and deoxyribonucleic acid (DNA). The research of nearly 50 years shows that nucleic acids carry all the genetic information of a life. They exist in the chromosomes of nucleus, determine the biologic heredity, guide the protein synthesis, control the differentiation and growth of cells and provide cells with nutrition and energy. So it can be said that from birth to death, the whole process of the life is dominated and controlled by nucleic acids. They are the foundation of life. All the signs of aging, such as the degeneration of the skin, hair loss and graying hair, loss of physical strength, fatigue of the body, weakening of the brainpower, fall of the eyesight, are all caused by the inhibition of nucleic acid synthesis or the insufficient supply of nucleic acids, which consequently cause the discontinuous production of new cells. People should supplement nucleic acids constantly to postpone aging and stay young. Foods rich in nucleic acids are sardine, salmon, lobster, crab, living oyster, liver, marine fish and mollusk. Soybean, haricot bean, onion, yeast and other foods also contain nucleic acids and substances which can produce nucleic acids. Nucleic acids should mainly be taken from food. However more supplement is not bound to mean better. Pine Pollen contains nucleic acid, with 48,65mg nucleic acid in each 100g of pine pollen.

Benefits of Substances in Pine Pollen

Folic acid in Pine Pollen

Pine Pollen contains folic acid, with 934ug in each 100g of pine pollen.

Folic acid, also named vitamin Bc or vitamin M, is one member of the vitamin B family. It exists widely in the green leaves of plants and in the liver or kidney of animals. The yeast also has a good content of it. Folic acid deficiency in the body will cause anemia of giant cells, accompanied by leukocytopenia, pathological changes of gastrointestinal track as well as the stagnation of growth. Recent research has shown that folic acid has more other physiological functions for the body and can prevent many diseases.

(1) The homocysteine in the blood is a metabolic product of methionine. It will cause plaques by damaging the endothelial cells of heart and blood vessels. The folic acid in the blood can convert the homocysteine into methionine. Sufficient folic acid in the body can prevent the production of homocysteine, which will lower the incidence of cardiovascular diseases.

(2) Folic acid deficiency of pregnant women will damage the key parts of the baby's spine and cause malformation of the baby's neural tube, which will lead to death or deformity of the baby. Therefore, it is essential for the pregnant women to supplement an appropriate amount of folic acid. The WHO suggests that each fertile woman should take 400ug folic acid each day.

(3) Folic acid deficiency for women will cause a low level of folic acid in the blood, thus the genes of the cervical cells are easily damaged by the virus, increasing the incidence of cancer. Research has shown that women having a low level of folic acid are five times more likely to get cervical cancer than those with a normal level of folic acid. It is the same case with the rectum cancer.

Folic acid is mainly extracted from such foods as green leaves vegetable, orange and tangerine, soybean, carrot, meat, corn, milk, rhizome vegetables (e.g. potato), etc. But folic acid can't endure light and heat. Most of it will be damaged when heated. Due to this factor, together with others such as malabsorption, metabolic disorders, increase of excretion people have to take folic acid from other food.

SOD (Superoxide Dismutase) in Pine Pollen

Before we get to know SOD, we should first know about free radicals. Why will people get ill, age and die? Recent research in biological and medical field has shown that they are caused by free radicals, which are high-energy particles that ricochet wildly and damage cells. Free radicals can be produced by metabolism in the body or enters the body from outside. If the "garbage" and toxin in the blood can not be cleared away in time, they will produce free radicals. If the toxic substances from the outside enter the body through respiration or contact of skin, they will deposit to produce free radicals. Free radicals can destroy the cell membrane of the organism or even cut off the DNA chain, thereby quicken the aging of cells and reduce the immunologic function of the organism or even induce cancer. Now it is confirmed that semi-quinone free radical may cause lung cancer, lipid free radical may cause breast cancer, superoxide free radical does harm to all kinds of tissues. So free radical is called the cell-killer. Substances which can eliminate free radical are vitamin C, vitamin E, vitamin A, coenzyme Q, glutathione, peroxidase, superoxide dismutase (SOD) and so on.

SOD is regarded as the most valuable substance to scavenge free radicals, inhibit cancer and aging, improve the immunity of the organism and control inflammation, etc. It was found by Mocord and Fridovich in 1968. Superoxide dismutase is an enzyme directly involved in antioxidation process, whose components include zinc, copper, manganese and other trace elements. Pine pollen contains a large amount of antioxidant, such as vitamin E, vitamin B, β -carotene and trace elements, etc. All these can slow down peroxidation of lipid and protein in the body thereby fulfills the function of postponing aging. Regular intake of pine pollen can regain youth, eliminate the age pigment and prolong life.



TCM Adaptogen Warehouse

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