



# A Brief Introduction to Apitherapy Health Care

Fang Zhu\*

Siriwat Wongsiri†

Apitherapy health care, or apitherapy for short, involves making use of bee acupuncture, bee products and the comprehensive natural factors of bee activities and apiaries to provide humans with medical care. Apitherapy was developed from traditional Chinese medicine, pharmacology and the subject of health preservation. It has since developed to a certain extent and has become a major frontier science between bees on one side and pharmacological science on the other. Beekeepers, including specialists and amateurs, and consumers of bee products have priority in acquiring apitherapy health care.

Acquiring apitherapy health care is a basic right for human beings struggling to survive. Contemporary society vies with one another and strives to enable members to attain a good medical condition. At the current level of medical science and technology, the condition of the medical care relates to the medical insurance and medical care systems in society, as well as self-health care. Therefore, popularizing and spreading apitherapy, which has been effectively used for thousands of years, is worthwhile because it is a simple, convenient and available method of self-health care.

\*International Society of Apitherapy, Yunnan Province, China

†Faculty of Science, Mae Fah Luang University, Chiang Rai Province, Thailand

## History and Current Situation

### Chinese apitherapy

The history of making use of bees and their products to provide humans with medical health care is a very long one. From ancient times wild pigs, black bears and other animals sought honey comb, and primitive man also learned to look for beehives in rock outcrops and the holes of trees. These bee colonies stored honey, pollen and pupa combs; they were certain to be targets for primitive men who suffered stings in getting these products. In fact, when they looked for the larvae and pupas of bees, ate honey and suffered stings, they were the first people to have received apitherapy.

China's ancient prescription book, *Fifty-two Prescriptions*, was written on a silk scroll and found in the third century B.C. in Han tomb No. 3 of Ma Wang Dui, located in Changsha, Hu'nan Province. It contains two prescriptions involving bees, one of which uses honey to treat diseases.

It was recorded in *Li Ji Nei Ze* that 2,300 years ago sweet honey had been used to show filial piety and respect for the elderly; moreover, bees and the larvae of cicada, which have a high nutritional value, were the food of monarchs and the other nobility.

*Sheng Nong's Herbal* came out 2,000 years ago; it records 365 kinds of medicinal materials, of which honey, beeswax and bees are considered higher grade

drugs capable of treating diseases and maintaining health.

*Prescriptions for Diseases* (25~88 A.D.), a manuscript written on 92 pieces of bamboo containing information on medicine and pharmacology, records that honey was the main ingredient in honey pills and an instant herbal mixture for treating cough associated with asthma. The *Treatise on Cold-induced Febrile Diseases*, written by Zhang Zhongjing, a medical saint in the Han dynasty, documents Mi Jian Dao Fang, which is a kind of honey suppository to treat frail patients' constipation. *Medical Treasures of the Golden Chamber*, also written by Zhang Zhongjing, is a prescription book on treatment for miscellaneous diseases. The book records that honey soup with liquorice powder was used to treat stomach ache caused by bellyworms and regulate Qi with beeswax for treating diarrhea. It contains 262 prescriptions, about 20 of which are pills and 80 per cent of them are honey pills. From that time on for nearly 1,800 years, honey pills have always kept this proportion.

*Prescription for Emergent Reference*, written by Ge Hong in the Jin dynasty, *Focuses of Shen Nong's Herbal*, written by Tao Hongjing (452~536 A.D.), *Collection of Proved Recipes*, written by Yao Sengyuan (499~583 A.D.), *Treatise on Property of Drugs*, written by Zhen Qian (541~643 A.D.), *Supplement to Invaluable Prescriptions and Supplement to Invaluable Prescriptions for Ready Reference*, written by Sun Simiao (581~682 A.D.), *Treatise on Dietetic Therapy*, written by Meng Xi (621~713 A.D.), *Chuan Xin Fang* (841 A.D.), written by Liu Yuxi, and *Taiping Royal Prescriptions* (992 A.D.), compiled by the Official Institute of the Imperial Physicians in the Song dynasty, are all ancient Chinese books, written over a thousand years ago. They have narrated the functions of bee products in medicine, pharmacology, dietetic therapy, the preservation of one's health and for anti-decrepitude.

*Treatise on Food*, written by Li Gao (1180~1251 A.D.), *Prescriptions for Universal Relief* (1406 A.D.),

which is the largest prescription book in China, *Compendium of Materia Medica*, written by Li Shizhen (1518~1593 A.D.) and *Chi Shui Xuan Zhu* (1584 A.D.), written by Sun Yikui and others, have further enriched apitherapy.

For a thousand years, bees and their products have been used in medical health care and regimens for hairdressing, and the method is currently being popularized throughout China. Traditional Tibetan medicine uniquely uses the application of bee products. About 1,200 years ago, the elder Yu TuoYuan Dan Gongbu, a Tibetan expert, wrote *Si Bu Yi Dian*, after amendment by Tibetan physicians. It was recompiled every dynasty; in the 11th century A.D., the book was again recompiled and amended by his 14th offspring, the new Yu TuoYuan Dan Gongbu. The book records drugs made of honey, yellow wax, hydromel, wild bees and bumblebees; it contains 100 prescriptions for treating diseases by eating honey or only using honey as a component.

*Dang Ha Ya Long*, the Dai nationality's ancient medical book, is also a huge book on medicine and pharmacology. It records treating diseases by using folk prescriptions: honey comb of *Apis dorsata* and *Apis florea*, branches of beehives and hives of the fossorial wasp. *Nie Su Nuo Qi*, the Yi nationality's book on medicine and pharmacology, narrates the medical function of honey, honeycomb, and bees, as well as antidotes to poisoning caused by poisonous honey. Zi Feng liquor, produced by an institute on national medicine and pharmacology in Simao, Yunnan Province, is used to treat rheumatic diseases and arthropathy. It is the same as used by the Gao Shan nationality's compatriots in Taiwan; they use bees to make alcohol and treat diseases or maintain health.

### **Current Apitherapy Health Care**

In the 1950s, countries with developed techniques for bee keeping began to explore the use of bee venom, royal jelly, and propolis. To develop traditional Chinese apitherapy, explore bee products and utilize them

to serve human health-care needs in an all-round way, on February 14, 1958, an article entitled *Bees - A Friend of Health*, written by Dr. Fang Zhu, was published by the *People's Daily*; it advocated the popularization of apitherapy health care. In August 1959, the Chinese Medicine Association compiled and published *People's Health Care* and *Chinese Magazine on Dermatology*, which presented papers on treating diseases using bee venom and propolis respectively. Dr. Fang Zhu was the first person to come up with the technique of bee acupuncture combining meridians and points. On January 16, 1960, Marshal Zhu De wrote to the central leadership of the Communist Party, Chairman Mao himself, to advocate that China develop the beekeeping industry and enthusiastically praised bees as the friend of people's health.

In the 1960s, the Chinese drug industry produced royal jelly products and venom injections. In September 1962, the Chinese Insect Institute held a beekeeping symposium on the use of royal jelly and bee venom. Participants exchanged observations about the therapeutic effects of these products and lab research results on royal jelly, bee venom, propolis and honey.

In the 1970s, Chinese apitherapy pharmaceuticals, such as the Feng Huang Tai Tablet and Rhinitis Ling, a preparation of honeycomb, and Chinese herbals' mixed in a prescription of royal jelly, for example, Peking Royal Jelly, came out. From June 27 to July 3, 1979, upon the establishment of the Apicultural Science Association of China, apitherapy papers were presented at a symposium, and the Bee Products Utilization and Apitherapy Team was established to discuss and exchange information.

In the 1980s, apitherapeutic pharmaceuticals, such as Propolis Tablets, Prostate Kang, a kind of a bee pollen preparation, and a new type of injection using a solution made from bee venom powder, were released in Jiangsu and Zhejiang provinces. Traditional bee products, which combined honey, royal jelly, propolis, beeswax and bee larvae, were used for pro-

tecting the skin and hairdressing in Beijing and Shanghai city, as well as in Jiangsu, Hubei and Zhejiang provinces. Between, November 1 and 5, 1980, the Apicultural Science Association of China held an academic seminar on the utilization of bee products in Lian Yungang, Jiangsu Province. A total of 16 provinces, municipalities, and autonomous regions and more than 70 representatives participated in the academic exchange, the main subject of which was the medical and pharmacological applications of bee products. A specialty commission was established at the seminar; Dr. Fang Zhu and Zhou Song were represented as directors and honorary members of the Lian Yungang Apitherapy Research Institute.

At the beginning of the 1980s, besides the Apitherapy Research Institute and the Apitherapy Hospital in Lian Yungang, another 22 provinces, cities and autonomous regions were carrying out applications on and lab research into bee acupuncture and apitherapy health care. They established an apitherapy hospital, research institutes, clinics and apitherapy departments in local areas or army hospitals, and sanitariums etc.

In 2005, the Apicultural Science Association of China organized 11 sessions of the National Specialty Conference on Apitherapy, in which many excellent papers were presented. There were 156 representatives from 23 provinces, municipalities and autonomous regions participating the 9th National Specialty Conference on Apitherapy, held in Xi'an. The conference exchanged 71 papers and published them in various periodicals. The conference began to hold specialty seminars on apitherapy and put forward marketing issues to assure the promotion and popularization of apitherapy health care and the management of bee products.

From January 1993 to September 2006, the specialty commission on apitherapy hosted five lectures on bee products and 42 training classes in which more than, 2,000 participants graduated, thus popularizing and expanding the bee products industry and

apitherapy country-wide. The specialty commission issued various technological data. Special periods were utilized in order to exchange apitherapy technology and research results, and develop apitherapy health care in a powerful manner.

The international group on apitherapy health care attached great importance to the experience of Chinese apitherapy. Chinese apitherapy products won the gold prize at the 31st, 32nd and 33rd International Conferences on Beekeeping from 1987 to 1993.

The International Apitherapy Health Care and International Bee Products Expositions, 1991~2006 were held in China, Japan, Malaysia and South Korea. They were organized by representatives of China, Japan, South Korea, United States and some countries in Europe, Africa and Oceania. Professor Fang Zhu was elected president of IAHPA (International Apitherapy Health Care & Beeacupuncture Association), then known as IABPS (International Apitherapy & Bee-products Society). Professor Fang Zhu was selected as the chairman of the those organizations. The secretariat is located in Singapore at the API Nutrition Center. IABPS strengthens cooperation and exchanges between eastern and western apitherapy practitioners and harmonizes the apitherapy and bee products industry.

Since 1993, Chinese items again repeatedly won laurels at International Bee-products Health Care Expositions. The variety of Chinese apitherapy goods and the high quantity of the products have increased step by step, and they are now sold all over the world.

From 1991 to 2006, president Dr. Fang Zhu of IAHPA joined in the first to the ninth international training classes on apitherapy health care held in China, Malaysia, Thailand and Singapore. More than 100 trainees graduated from those courses. It has proved useful for the bee-product industry and apitherapy specialists to cooperate, observe, exchange information and visit one another. The 9th training class was held in Kunming and the main subject was "relations between liver trouble, cancer and

apitherapy." Bee acupuncture combines bee products and Chinese medicine to provide a new way to treat cancer. It provides a wholly therapeutic effect by playing a compound and cooperative role from many perspectives. Its success provides many people suffering from stubborn diseases with new hope.

Nowadays, the trend is to return to nature. For one thing, people begin to pay greater attention to natural products which have been used for thousands of years; for another, the bee industry and medical groups think increasingly highly of the application of bees and bee products for medical health care.

## Basic Concepts of Apitherapy Health Care

### Utilization of bee products collected from bee honey, bee pollen and propolis

*Sheng Nong's Herbal*, completed 2,000 years ago, described honey as "sweet, gentle, in charge of evil influences in the heart and abdomen, as well as frights, epilepsy and spasm." It describes it as "calming the deficiency of zang organs, replenishing Qi, toning the middle-jiao, alleviating pains, relieving poison, removing diseases and harmonizing medicines." Eating honey frequently can strengthen people's will and make them feel brisk without hunger or weakness. Li Shizhen, a physician and pharmacist in the Ming dynasty, introduced 20 kinds of bee honey prescriptions in the *Compendium Materia Medica* and described the functions of honey, such as "resolving heat, tonifying the middle-jiao, neutralizing poison, moistening dryness and alleviating pains," etc.

Many nutrients, monosaccharides, enzymes, organic acids, elements, microelements and so on comprise honey. Honey is available for patients with liver, kidney and cardiovascular trouble, among other conditions. It is better for patients with hepatic disease to eat honey instead of sugar. Animal experiments have also proved that honey maintains the liver, promotes regeneration of hepatocytes and prevents the formation of a fatty liver. Bee honey has a good effect

on treating enterogastropathy, neurasthenia, anemia and tuberculosis and in helping patients to recover from surgery. Therefore, children who eat honey frequently have a faster growth in weight and higher quantity of hemoglobin. Honey can build up their ability to resist diseases; moreover, it is useful for health and longevity.

Mature honey has an antibiotic effect. It can be used externally to treat chronic ulcers of the crura, skin wounds, stomatocace, pediatric thrush, frostbite, burns and some forms of dermatopathy. Honey is an essential ingredient in many skin-protection creams and cosmetics. Honey is commonly used for correcting flavors, excipients, binders in pharmaceuticals. Refining honey into pills is a preparation of traditional Chinese medicine. Special medicaments of bee honey can be used to treat disease in five sense organs; its aerosol can treat pathological changes of the respiratory tract; a suppository can treat the anus, as well as the intestines and can be used even in gynecopathy. In recent years, the operation of organ transplantation has become well developed; it has been proved that if honey is used as an ingredient to maintain organs, persons will receive good effects.

Because of different origins, bee honey has different color, fragrance, flavor, ingredients and effect. Honey of a single-flower, for instance, honey of *Codonopsis pilosula*, loquat, mint, and Chinese goldthread, has a bright future. Ceromel is an excellent natural and mature honey with great value in dietetic therapy.

Pollen is the only source of essential protein in bees and bee larvae. Each group of bees collects of more than 30 kg of useful pollen every year; protein and sugar account for more than 50 percent of the pollen. Pollen includes all necessary amino acids needed by human beings and in the right proportion; most lipids in pollen are unsaturated fatty acids, which give humans the necessary linoleic and linolenic acids. Life demands essential microgenes, e.g. various vitamins, major elements and microelements. Above

all, there are many bioactive substances in pollen, such as kinase, flavone compound, hormone, immune protein and calmodulin and they can regulate organs in two ways. Pollen can strengthen the organic ability of the body to overcome the effects of stress and greatly improve one's health, and prevent senescence. With regard to sports, it has been proved that pollen could strengthen athletes' physical force, resistance, dispel fatigue rapidly and maintain a good athletic condition. In recent years, many athletes participating in the Olympic games have eaten pollen products regularly and their body's constitution and records have improved. Chinese scholars used pollen to prevent acute altitude stress. They used the double-blind method and validated it in Kun Lun Mountain, in Ka La, Sinkiang and Tang Gu La Mountain, in Tibet. It is known that the altitude there is above 5,000 meters.

According to observations on the clinical applications of bee pollen, it has a good effect on treating prostatosis and sexual dysfunction in men; middle-aged men and the elderly should take pollen to prevent excessive hyperplasia of the prostate and thus preclude the need for surgery. Hundreds of infertile men were able to produce babies after bee-pollen treatment. It is also useful for treating diseases such as chronic and active hepatitis, bad appetite, weak digestion and absorption, and in preventing duodenal ulcer, hemorrhage, chronic atrophy gastritis and habitual constipation. Pollen is used to cure menopausal syndrome, psychopathy, depressive syndrome and chronic alcoholism and atrophy of the nervous system. It can strengthen one's constitution, prevent or treat the poor permeability of capillary vessels, cerebral atherosclerosis and diabetes. Pollen plays an active role in many human functions, promoting growth and development, preventing malnutrition and accelerating recovery after operations and illness. Taking pollen frequently or using it as a kind of cosmetic is effective for protecting the skin and in hairdressing; moreover, it can eliminate acne, flecks, nevus, age pigment and small wrinkles.

As is the case with many plants bestowed by nature and used for medical health care, pollen has special plant functions. After processing by bees, pollen becomes more active and effective. Nature bestows humanity with rich pollen resources every year; however, only a few of them are currently used for medical health care. In recent years, Chinese people use cole, tea, corn, and sunflower. For fruits, they use pollen or powder of apples, Chinese chestnut, etc. For medicinal materials, they use *Codonopsis pilosula*, mint, fructus schizandrae, fruit of Chinese magnolia, wild chrysanthemum and so on. Pollen has huge potential that needs to be explored and made use of.

If keepers of western bees open the beehive in the summer or autumn, they will find the cover cloth conglutinated, usually by filemot propolis. In the dark beehive, bees fly in and out frequently and the spaces are narrow; moreover, the temperature and humidity are suitable for the growth of microbes, yet the colony remains clean all the time: it is impossible to find trichia and mold or decay. Why? Propolis plays an important role in beehive sanitation. It is known that propolis is a unique substance that restrains the growth of mildew in the hive; in addition, propolis can control bacteria, viruses and protozoa, so it has wide biological activity. In terms of bees transferring the effective components of plants to humans, propolis is a kind of natural medicine and health product with high efficiency.

Propolis contains many flavone mixtures, benzoic acid, cassic acid and alcohol, hydroxybenzene, aldehyde, ketone, ether, a mixture of olefin and terpene with pharmacological and biological activities, and fatty acids, steroids, amino acids, enzymes, amylose, vitamins and 30 chemical elements. Propolis not only possesses broad-spectrum biological activity, but it also cooperates with some antibiotics to neutralize some bacterial exotoxins. Taking acheomycin for a long time may cause an imbalance in the alimentary canal of parasites, as well as affect the development

of thrush, staphylococca enteritis and so on. Experiments on animals and clinical observations however show that frequently taking propolis will not result in disequilibrium of bacteria; instead, it improves organic immune functions. Many Europeans take propolis frequently to prevent epidemic influenza and other epidemics in autumn and winter; besides, it has been successfully used as an adjuvant immune agent of many bacterins.

As a folk medicine, propolis has been used to treat helosis and tumors for many years. During the war (1899~1902) between South Africa and England, it was used to treat wounds. Modern medicine proves that externally applied agents made with propolis have a good effect on treating herpes zoster, tinea, burns, chilblain, chap, common acne, eczema and dermatitis, chronic ulcers of the lower limbs and other skin problems, e.g. patients with herpes zoster take propolis tincture to stop pain and eliminate the occurrence quickly; propolis aerosol can be used to treat asthma and inflammation of the alimentary canal. Taking propolis orally is useful in treating diseases such as gastric and duodenal ulcer, chronic gastritis, enteritis, hyperlipidemia and constipation. Lab research and clinical observation globally have proved that propolis tincture can heal gastric and duodenal ulcers with high efficiency. Many special formulations of propolis are available for treating wounds, ulcers, inflammation connected with surgery, gynecology, the anus and intestines, stomatology and the five sense organs. For instance, the medical line of propolis developed for ligation and propolis tincture used for naevus have a high rate of cure, being used to cure recurring aphtha. Propolis tincture compounded with anesthesia is used for dental extraction. A small number of people may react negatively to propolis, producing symptoms such as contiguity dermatitis, urticaria, hypernaemia and dropsy of the mucous membrane, but those symptoms will disappear once its administration has been stopped.

Recently, it has become popular to make propo-

lis into drugs and health foods. Experiments have proved that propolis also has the following effects: anti-fatigue, prevention of hyperlipidemia, anti-inflammation, anti-oxygenation, prevention of ulcers, anti-tumor, local anesthesia, pain relief, liver maintenance strengthening the brain, wit benefit, relief of constipation with laxatives, blood sugar regulation, relief of itching and promotion of tissues healing in injuries. It has a surprising effect on many stubborn diseases.

The above three products are made of ingredients collected from plants. At the beginning, people only paid attention to honey and used that product. Honey and pollen powder are the food of bees. People took honey and pollen for nutritional health care and some other medical and pharmacological purposes; the research into and exploration of propolis occurred later, but bees also collect propolis to protect the bee colonies and defend against pests, so propolis is called the medicine of the bee colony. Therefore, propolis has a bright future as it has the largest potential for use in medical care.

The secretions of bees, namely stings, royal jelly, beeswax and bee venom, are fragrant and clear. They are secreted from the acid and alkali glands of the sting organs of bees, and flow out of the vesicle through stingers when the bees are stinging.

The method for applying bee stings to treat diseases has a long history in China; it is called "evil must be driven out by evil." Since the 1960s, the combination of biochemical analysis and pharmacological study has gradually revealed the functions and active constituents of the liquid secreted from the stingers. More than 10 active peptides have been identified in this fluid, of which melittin accounts for more than 50 percent by dry weight. Enzymes, e.g. phospholipase A2 and hyaluronidase, some biogenic amines, e.g. histamine and catecholamine are also active constituents, and they have medical activities as well.

The liquid is a kind of self-defensive toxin of bees to defend against enemies. If people are not

allergic to bee venom, they will suffer pharyngitis, hemolysis and the other toxic symptoms upon receiving approximately 200 - 300 bee stings. A person will usually die of paralysis of the respiratory center if stung by 700 - 1,000 bees. In order to treat diseases, people are administered several stings or preparations of bee venom after assuring that they do not have an adverse reaction. Experience shows that the liquid secreted from the bee stings produces a good medical effect in the treatment of rheumatism, rheumatoid arthritis, sciatica, trigeminal neuralgia, facial paralysis, cerebrovascular sequela, hypertension, deep thrombophlebitis, bronchial asthma, allergic rhinitis, conjunctivitis, iridocyclitis, erythema nodosum and psoriasis.

Bee keepers attending hives frequently suffer stings; most of them will develop immunity against bee venom sooner or later. They will not have serious reactions if they are stung by up to hundreds of bees at a time, although some of them may be sensitive to the venom. Persons who are allergic will have strong localized responses or a general reaction even though they are stung by only one bee; they may even suffer an allergic reaction and go into shock. The pure medicament of bee venom can be used to treat allergies and make diagnostic skin tests and for the purpose of desensitization.

With the application of the technology of extracting bee venom electrically, loyphile powder injection, ointment and cream of purified bee venom have efficiently come into the market one by one at stable prices. The chemical constituents of bee venom have been deeply researched; although three kinds of bioactive peptides can be synthesized in the lab, prepared natural bee venom still provides the best medical medicament.

Royal jelly is used to feed the queen bee and larvae of worker bees in the colony. Oosperm grows more quickly after taking royal jelly in a three-day period and its weight can increase by as much as 250 times. The larva in the queen comb is fed with royal

jelly by worker bees; the single larva will develop into a new queen bee with healthy and wholesome female organs. The larvae in the hive of worker bees are fed with a mixture of honey and pollen powder after three days of age. The larvae will develop into worker bees, with dyshematopietic female organs, on the 21<sup>st</sup> day. The body form of a queen bee is larger than that of a worker bee. The queen bee is highly fecund. The weight of its eggs exceeds its own weight.

The life span of the queen bee is also longer than that of worker bees. Usually, the queen bee can live for three to five years, but worker bees live for only 30 to 60 days in the collecting season, and five to six months at the end of winter. Although the queen bee and worker bees are also developed from oosperm, they have greatly different body functions and life span, which has aroused people's interest in royal jelly.

In the 1950s, Europeans began to attach great importance to the medical effects of royal jelly. In 1956, the health of the 80-year-old Pope was endangered. His doctor-in-charge had used up all ways to help him, but in vain. In desperation, he gave the Pope royal jelly and it brought him through. Then, the pontiff joined in the 16th International Conference on Keeping Bees and introduced his own experience that royal jelly enabled him to recover. Clinical practices have shown that royal jelly has a good effect on treating caducity and weakness, menopausal syndromes, psychoneurosis, insomnia, anorexia, anemia and hyperlipidemia. Besides, it is also used to treat diabetes, leucocytopenia, sterility, hepatitis, arthritis, dysthymia and cerebrarteriosclerosis. Patients with a malignant tumor can receive a stronger therapeutical effect and experience fewer side effects from radiotherapy or chemotherapy if the treatments are combined with royal jelly.

External use of fresh royal jelly can moisten the skin, and treat dermatitis and baldness, etc. Concerning its constituents and the physiological and pharmacological functions of royal jelly, researchers have

investigated them systemically but the results could not explain its magic-like bioactivity, and this needs further study. For health care, the dosage of fresh royal jelly is 2~3g daily, taken sublingually in the morning and evening, which enables the bioactive constituents to be absorbed through the mucous membrans of the mouth. If the illness is serious, the dosage can be increased by 5 to 10 times. Small packets of loyphile powder are easy to keep and apply. They can be taken in 0.5g doses sublingually. Fresh royal jelly must be kept under conditions of low temperature, even to freezing, in the absence of sunshine, because the bioactive constituents may be influenced by light, and heat, among many other factors. It is difficult for the type of oral liquid on the market to maintain the bioactivity of fresh royal jelly, because its content is too low to treat diseases. Frequently used compound preparations add ginseng and membranous milk vetch roots. This produces a kind of compound reaction of Chinese medicine. It has been found that 10-HDA is peculiar to royal jelly and it can defend against bacteria, restrain the metastasis of tumors in animals, help patients recover and improve the immune system.

*Sheng Nong's Herbal*, regards beeswax as a top-grade spirit and describes beeswax as sweet, lukewarm, useful for curing dysentery, pus and blood, invigorating the middle-jiao, healing wounds or sores, and benefiting Qi; Ben Cao Tong Xuan claims that beeswax can reproduce muscles and stop pain. Fifteen kinds of beeswax prescriptions in the ancient books were selected for inclusion in the Big Dictionary of Chinese Medicine. Beeswax treatment, which uses the melting beeswax as a heat medium to conduct heat throughout the body to treat diseases, has a very long history. Information about it can be found in detail in the *Supplement to Invaluable Prescriptions for Ready Reference* and the *Chuan Xin Fang* of Liu Yuxi, in the Tang dynasty.

Modern pharmacology usually uses beeswax as the raw material for making ointment, plaster and



cream for medical use and protecting the skin; moreover, beeswax is also used to make the shells of some capsules and pills and tooth models, etc. Currently, in the operation of transplanting electronic instruments into the human body, the rubber membranes used by physicians also contain beeswax.

When people eat ceromel and chew honeycomb, symptoms of rhinitis have been found to improve; for this reason liquor of Rhinitis Ling was formulated. Patients can take 10~15g of comb with a little honey on it or prepared honeycomb pills and chew these for 30 minutes, then spit out the dregs. This is done twice a day and continued for 10~15 days. The pill form produces a good therapeutic effect on chronic rhinitis. Although it has a quick effect on treating allergic rhinitis, symptoms will recur once it is no longer taken. The honeycomb pill also has produced a better therapeutic effect on patients with a short course of chronic assistant nasal sinusitis, but a bad effect on treating those with a long course of pachymucosa in the sinusal cavity. In the course of treating rhinitis with honeycomb, complications such as hepatitis improved; it also plays an important role in treating hepatitis. Preparations of honeycomb are used to treat chronic hepatitis B surface antigen (HBsAg) carriers and its rate of returning to yin is 35.0~42.22 percent. The data are higher than those for groups of transferring factors (15%) and immunity ridonucleic acid (RNA) therapy (12.5%); the dynamic demonstration of immune reactions before and after treatment indicates that preparations of honeycomb can improve the immune functions of organs.

Different from *Nidus Vespa* in Chinese herbals, honeycomb has different functions. *Nidus Vespa* is the comb of *Vespida* insects, Japanese bees and wasps. Experiments have proved that the infusion of honeycomb can exterminate hepatitis B surface antigen (HBsAg); meanwhile, it can restrain the growth of golden staphylococcal bacteria, bacillus pyocyaneus, escherichia coli, shigella dysenteiae, typhoid bacillus and some viruses. The chemical components of hon-

eycomb are complex; they include resin, tannic acid, amino acid, enzymes, insect hormone and the other bioactive components, but these mechanisms need further research. Maintaining bioactive components that cannot resist heat in the honeycomb serves to expand the applicable scope of honeycomb preparations.

### **Utilization of bees and colonies of bees: bee brood, bee body, bee stings and apiaries**

The terms bee brood, or bee fetus, refer to the larvae and pupas of bees. In ancient times, Chinese people had used bees for medical health care. *Sheng Nong's Herbal* made it the top-grade spirit and recorded that it is sweet, smooth, "good for curing head madness, getting rid of poison produced by venomous insects, invigorating weakness and benefiting middle-jiao." Taking it over long periods will make the skin bright. *Ling Biao Lu Yi Ji*, written by Liu Xun, in the Tang dynasty, described that the method for making brood products.

Tissues of bee larvae and pupas contain rich nutrient substances, ecdysone and juvenile hormone. The amino acid of queen bee larvae is similar to royal jelly. Royal jelly obtained while collecting larvae of the queen bee, within 0~70 hours after removing the larvae, will contain a proportion between royal jelly and larvae of about 3:1. The pupas of male bees generated in the season of producing bees; 22 or 23-day-old male bee pupas are used to make products such as loyphile powder. This can be used to concoct many foods, medicaments and cosmetics. In Hangzhou, Zhejiang Province, loyphile powder of queen bee larvae is made into Feng Huang Tai Tablet, and male bee pupas, which are boiled in salty water, are preferred in Japanese bee brood cans.

Bee brood and its products are good for treating weakness, fatigue, malnutrition, neurasthenic patients after a disease or operation, as well as babies, elderly people, and people who need invigoration. Feng Huang Tai Tablet is useful for main farming health and treat-

ing rheumatoid arthritis, liver trouble and leucocytopenia. Tablets of male larvae and pupas are good for treating the obstructed development of children's intelligence and improving male sexual functions as well as strengthening the kidney and invigorate the yang.

Middle-aged bees can be used in medicine as a whole. Folk bee prescriptions may be taken orally and externally to treat rheumatism, gynecopathy, asthma and bronchitis. *Chi Shui Xuan Zhu*, a medical book of the Ming dynasty, recorded that people have used bee prescriptions to heal lymph node problems. Bees should be kept in closed packets after drying over a slow fire and crushing the contents. The packets should be placed on the area with rheumatic pain or on the lower abdomen of gynecopathy patients, using hot bricks pressed on the packet quickly after dipping it into water, fixing it with small sand bags and covering it with a cotton blanket for 30~50 minutes, once a day for 10~15 days at a time. Homeopathy uses drops, pills and ointments made of bee products to treat diseases. All books on homeopathy describe how people employ bees to treat various diseases.

Bee acupuncture cannot work without colonies of bees breeding in the open; therefore, apitherapy specialists should be good at keeping bees.

It is believed that living and working conditions play a very important role in health. N.P. Iolish, a Russian, who has a master's degree in medicine, surveyed the health condition of 390 beekeepers' in the Ukraine; of that number, 273 had worked in an apiary from 5 to 57 years, but were never ill since they began keeping bees. Twenty-two had suffered from rheumatism, but after being stung by bees they become asymptomatic.

A beekeeper said that he had been working in the apiary for 45 years and never got an illness. Three generations of his family had kept bees. His parents were still healthy; his grandfather died of natural causes when he was 105 years old. Another beekeeper

had kept bees for 40 years and never got an illness. His mother was also a beekeeper; in 1951, she was 108 years old and still healthy. One of China's modern beekeepers, Zhuang Yuancheng, lived in Fukien; he died in 1988, at 96 years of age. Wang Boya lived in Hebei; he died in 1991, at 94 years of age, and his wife was still healthy at that time (she was 98 years old); they had always kept bees.

In an open-air apiary, people can smell the fresh air scented by wax, propolis and fragrant flowers, and feel the sunshine that stimulates all life to grow. One can see bees full of life flying in and out of their hive, and listen to bursts of bee sounds, share many fresh and sweet bee products. Such a place is a more pleasant than Utopia. Beekeepers have simple satisfactions, great joys and strengthened abilities in resisting disease; they are still strong even when they become old. Such a place provides a extremely effective "work entertainment therapy." In American cities, the number of residents involved in amateur beekeeping has reached more than 200,000. People living in downtown areas put all kinds of bee hives in their courtyard or on the veranda. American society is extremely competitive and fast-paced; in such a setting more and more people hope to relax their tensions and improve their health by the natural movements involved with keeping bees.

To advocate medical care and prevent disease, we should encourage retired persons and the disabled to acquire joy, health and longevity in the apiary. In addition people with arthropathy, high blood pressure, and psychoneurosis following disease or surgery, and weakness should be engaged in keeping bees.

We should like to suggest that conditioned medical recovery institutes establish apiary recovery programs in unique sanitarium areas. Apiary products can be used for medical care. A bee colony is like a pharmaceutical factory. Doctors can order them and let these flying pharmacists make all kinds of pharmaceutical honey, vitamins and microelements, all of which contribute to people's medical health.