

## BEES

I'm a king bee, baby, buzzin' round your hive.

**ROLLING STONES**

They surround me like bees at the honey; they attack me, as fire attacks brushwood, but in the Lord's name I will drive them away.

**PSALM 118:12**

Auto-da-fé and judgement  
Are nothing to the bee;  
His separation from his rose  
To him seems misery.

**EMILY DICKINSON**

Last night, as I was sleeping, I dreamt- marvelous error! That I had a beehive here inside my heart. And the golden bees were making white combs and sweet honey from my old failures.

**A. MACHADO**

Although naturalized to northern Canada, the bee plays an important role in good health. Today, most of the commercial beehives in are over-wintered both for cost; and more importantly, to prevent the introduction of disease from the south. Alas, not with complete success.

In 1998, Alberta exported over 4 million kg. of honey worldwide, for a value of just over \$10 million.

Native peoples made infusions of wild honeybee and gave it to those suffering from suppressed urine. The same remedy also assisted those needing to suppress sexual over-indulgence. Ironically, in Europe, newly wed couples drank a honey wine called **HYROMEL** every night during the first month of marriage; hence the term honeymoon.

The Cherokee used the bee in difficult labour. Alder bark was scraped upwards from the root and a weak decoction made with a pint of water.

A small amount of dried, powdered bumblebee was added to a half cup of the above tea. A single tablespoon was taken and seldom needed repeating.

The Cree of Northern Alberta refer to the bee as **AMO**, and the honey from the hive, **AMOMEY**.

The Dene Nation of northern Canada, burned bee and wasp hives into ash, for application to swellings, boils, and skin rashes. Celine Eyakfwo says "they light the beehive and burn it when it turn to ashes. When they burn it really good then they add a little bit of water into ashes. When they smear it on our swollen part it feels like burning. It just feels like burning and hot. When they do that then it would go away. If it would go away then it goes away. And if it has to break open it would break open".

In 17th century Europe, the bee was killed with sulfur fumes, baked and powdered and given for urinary stone and other obstructions.

The ashes of bees were added to oil of rose to cause rapid hair growth. In Syria, bees were roasted in olive oil to help turn gray hair black.

It is worth noting that beekeepers have the lowest incidence of cancer of all the occupations. Those handling bees have long known that the insects dislike alcohol, and will attack keepers who have ingested any amount.

And it is worth noting that substances from the beehive are mentioned in every religious text written; including the Bible, Koran, Torah, Book of Mormon and Scrolls of the Orient.

Throughout history, humans have been functional cleptoparasites of honeybees.

The first bee-keeping images were put on cave walls in Valenica, Spain around 7000 BCE.

The Bee goddess, representing the Mother and the hive representing her womb, was found painted on a vase dating around 6000 BCE.

The bee appears quite frequently as a symbol of the soul. In the Orphic teachings of Greece, the bee was the emblem of the soul. Priestesses at Eleusis were known as bees and were Essence priests. In the Christian tradition the term beehive is used to describe either the church or monastic communities.

A bee's honey and sting represent sweetness and pain.

In Siberia, the Buriats depicted the soul as a bee visible when issuing from the mouth of a sleeping person. It was born of the tears of the Egyptian Sun God Ra.

In Hittite mythology, the bee saved the world from drought by finding the lost son of the Weather God.

Indo-Malaysian and Moslem traditions also speak of the soul as a bee. In India, a blue bee on the forehead symbolizes Krishna, on a triangle, Shiva, and on a lotus, Vishnu.

The Mayans used the same word for the world and for honey. In fact, Ah Muzen Cab, was the Mayan God of Bees, whom the books of the Jaguar Priest say created the world. They would sometimes add a toad (*Bufo marinus*) to their honey mead. The toad's venom contains DMT, which added a certain psychedelic twist to the drink. The honey was produced from the flower of the Turina corymbosa, in itself a powerful hallucinogen. Mayans still collect this honey to make **BALCHÉ**, a narcotic mead. The honey was used to induce labour during childbirth due to ergoline alkaloids that stimulate uterine contractions.

In early Christian mystical writings, the bee came to symbolize virginity, perhaps because no one ever saw them mating. In Slavic folk tradition, the bee is linked with the Immaculate Conception. The feast of St. Anna, mother of Mary, is held on July 26, the time for beekeepers to pray for the conception of healthy new bees.

Hildegard de Bingen, the 12th century mystic, wrote "for anyone on whom ganglia grow, or who has had some limb moved from its place, or who has any crushed limbs, take bees that are not alive...put a sufficient amount on a linen cloth, and sew it up. Soak

this cloth, with the bees sewn within, in olive oil and place it over the ailing limb".

She recommended "a person whose eyes are cloudy should take the small bladder from between the head and stomach of the bumblebee. One you has deep scabies on his head should often smear the same liquid over his head and he will be cured".

Bee larvae are a popular food, in countries such as Thailand, Japan and Korea. The honeybee larvae is a richer source of protein than pork, and is similar in vitamin and mineral content to chicken and shrimp.

The leafcutter bee (*Megachile* sp.) is a typical solitary. There are no workers, and all females are capable of motherhood. She will cut neat round or oval pieces from rose leaves and fashion cylindrical cells in a tubular hole in rotten wood. When complete, it is filled with a mixture of pollen and nectar, and egg is laid and the mother bee puts on the lid and builds another cell on top.

The introduced honey bee is the official insect in twelve different states of America. It makes possible the reproduction of 80% of the world's grains, fruits, vegetables and legumes.

The communal life of bees has inspired architects and artists. Several interesting people come to mind, including Juan Antonio Ramirez. He published a book *Beehive Metaphor* in 1998 that explores relationships of communal buildings and social creatures, such as insects and humans.

Those interested in such connections may wish to look at the work of Antonio Gaudi, Mies van der Rohe, Charles Jeanneret and Frank Lloyd Wright. The last three all lived in Berlin at the same time, and this may have set the inspiration of collective harmony in their future work.

The uncontrolled use of antibiotics is now creating *Candida* and other infections in beehives, which cause high mortality amongst both pupae and larvae.

Antibiotics, if used at all, should be discontinued at least 14 days before the flow of nectar.

New Zealand beekeepers do not use antibiotics to control American foulbrood for example, because their residue free products receive preferential access to Japan and other countries.

Both larvae and pupae are a tasty protein rich food. Oven dry at 70-80 C or fry up in butter.

Varroa resistant bees may be coming, as the honeybee genome has been sequenced. In 1920, Rudolf Steiner warned that artificial breeding of queens would lead to dire effects.

When a beekeeper in the audience objected, he said they should talk again in a century.

## **HONEY**

**CONSTITUENTS-** various sugars, including 38% fructose, 31% glucose, 7.2% maltose; inhibine (hydrogen peroxide), enzymes including glucose oxidase, invertase, amylase, catalase, and acid phosphatase; numerous flavonoids and phenolics including naringenin, pinocembrin, p-coumaric acid, cinnamic acid, kaempferol, galangin, chrysin, quercetin and techochrysin (2-18 micrograms/ gram). Honey also contains various acids, including gluconic,

butyric, acetic, formic, lactic, succinic, pyroglutamic, malic, citric, and oxalic.

Buckwheat honey contains high amounts of hydroxybenzoic and hydroxycinnamic acids.

Honey is the food of foods, the drink of drinks, and the remedy of remedies.

### **ISLAMIC SAYING**

To make a prairie it takes a clover and one bee.

**EMILY DICKINSON**

Once a rare and divine medicine- honey was called the perspiration of the sky, the saliva of the stars...

**THEODORE ZELDIN**

"Eat honey, my son, for it is good" was advice given by Solomon around 1000 B.C. The word honey is believed derived from the Hebrew **GHONEG**, which means literally, delight.

Pliny could not decide whether honey was the sweat of the sky, the saliva of the stars, or a juice formed from the air as it cleared itself. Aristotle called it dew distilled from the stars and rainbows.

St. Francis de Sales in 1708, mentioned that "all kinds of precious stones cast into honey become more brilliant thereby".

Medicinal honey was extolled in Sumerian tablets carved over 4,000 years ago. The ancient Egyptians, Assyrians, Chinese, Romans and Greeks all used honey to treat wounds and diseases of the gut.

An Egyptian myth recalls the sun god Ra crying, and tears dropping from his eyes turned into bees making honey.

The ancient Persians used honey to cleanse mortals of sin, because it came from sinless bees who created the precious fluid without touching the flowers.

Honey was so highly prized by the ancient Anglo-Saxon chiefs that portions were demanded as taxes and tribute. It was prized for making mead, a honey wine, or methgelyn beer. The Greeks also made a kind of mead or "hydromeli", as did the Romans, who called their honey and wine must compounds, *Mulsum*.

Galen mentions oxymeli, honey mixed with vinegar as a medicine, no fewer than 221 times.

In fact, Attila the Hun drank so much mead on the day of his wedding that he suffered a heart attack.

A similar liqueur is today distilled in Georgia and called *Santlis*, while the national drink of Ethiopia, *Tej* is also made from fermented honey.

The Slavs used honey in love potions, and the Magyars of Hungary smeared honey on genitals of young men and women to make them more attractive to opposite sex.

Various Brazilian tribes conduct fall honey festivals, after gathering it in spring and hanging it in gourds from ceilings. A creation myth of the Caduveo of central South America, tells of a falcon seeing honey forming in gourds and told the creator god to put it in the middle of trees so humans had to work to retrieve it.

Honey was considered in 17th century medicine to be 'hot and dry', and not good for the liver and spleen in those with hot temperament.

The Chinese believe however, that crude honey is cool, and the purified product is warming and digestive. According to old Hindu medical writers, new honey is laxative, and honey older than a year much more astringent.

Ancient Syrians mixed honey and hot water to inject into their nostrils for phlegmatic congestion or head pain.

Honey has been used in Egypt as an embalming liquid; and Alexander the Great was buried with a honey coating. Mummies in Egypt were traditionally covered with beeswax, the name derived from the Egyptian name for wax, **MUM**.

The Talmud said honey was a remedy for gout and heart trouble and would heal the wounds of men and beasts.

Honey is gathered from the nectar of flowers and brewed between 80-85 degrees F. To manufacture one kilo of honey requires an average of 200,000 loads of nectar, or about ten million visits to individual flowers. To put it another way, each bee during her lifetime produces 1/12<sup>th</sup> of a teaspoon.

The average hive of 20,000 bees needs about 15 kilos of honey to overwinter. Bees reduce both brain activity and the size of their brain in winter, and then enlarge brain activity when flowers bloom in spring. Meyer-Rochow et al, *Ethology Ecology and Evolution* 2002 14.

Today, raw, unpasteurized honey is still prized for its nutritional and medicinal value. Containing fructose and laevulose; it is not metabolized through the pancreas in the manner of refined sugar.

Work by Plachy in 1944 suggests honey from high altitudes is stronger anti-bacterial than honey produced in valleys.

Recent research out of Poland suggests that organic honey may be more desirable for consumers. Work by Glinski, *Medycyna Weterynaryjna* 2000 56:10 looked at honey contaminated with sulfa drugs, and its allergic and suppressive action on the immune system.

A recent human clinical trial showed that daily consumption of honey helps prevent lipid peroxidation, the damaging of free radicals, and the precursor to atherosclerosis and cardiac disease.

In one trial, 25 men aged 18-68 drank a mixture of four tablespoons of honey in water daily for five weeks, with significant improvement of blood antioxidant levels.

Specialty honeys, of course, hold and transfer the energetics of specific flowers to the consumer. Sweet clover, fireweed, dandelion, buckwheat, goldenrod, and willow are a few available on the prairies. Sunflower honey is considered good for fevers, linden flower honey for insomnia, and Thyme honey for stimulating digestion.

Manuka honey from New Zealand is a strong anti-microbial.

Honey collected from the high aluminum soils of North Carolina, for example, has a bluish hue; most unattractive as a food.

The so-called Pine Honey is in fact honeydew, a sweet sticky liquid exuded by the aphids that live in pine forests, and feeding on the sap of young shoots. This is collected and processed by bees in the manner of honey, as conifers do not bear nectar-producing flowers.

Honey derived from dandelions, canola or other members of the Brassica family crystallize in 2-3 weeks, often while still in the comb.

And Linden nectar, while pleasant in honey form to humans, has a stupefying effect on bees. Honey from the nectar of Belladonna, Henbane and other Solanum genus retains some of the plant alkaloids psychoactive effect. Even multiple bee or wasp stings can induce euphoria and heighten perceptions of colour and geometric forms.

Buckwheat honey has been shown, in studies by Peter Chang et al, to contain high concentrations of kaempferol, making it high in anti-oxidant value. Work by Engeseth et al, U of Illinois found in a human trial that the higher the ORAC value, the greater the inhibition of oxidation.

A study in China, found Buckwheat honey inhibited *E. coli* and *Salmonella* species at full strength.

Bee Well Laboratories from Israel have developed very unique medicines, based on honey infused with therapeutic properties. Treatment for asthmatic bronchitis, to gynecological problems, to simple wounds and ulcers are produced by feeding the bees medicinal herbs, as well as various ferments and micro-elements which the bees turn into honey.

If you are interested in different honeys from around the world, you must visit Les Abeilles in Paris. The owner has a private collection of over 200 honeys, and vast varieties are for sale. The shop's owner is involved with a society for city beekeepers with some 300 rooftop hives around the city.

Another fun adventure is the annual Sagra del Miele held each October in Sicily. Local varieties are for tasting and sale. Rose honey, tasting almost licorice like, sells for 136 Euros per pound!

Honey is very useful in chronic bronchitis, and healing peptic and duodenal ulcers.

A new study is trying to determine if honey can kill the *Helicobacter pylori* bacterium that can cause ulcers. One study of twenty cases of ulcers showed complete healing in 15 patients, and progress in three, with pain completely disappearing in 18 and decreased in other two. Patients took one third cup of honey three times daily before meals.

It helps clear the most chronic constipation with its laxative effect; as well as chronic diarrhea from either a bacterial or viral origin. It is safe for pregnancy and taken first thing in morning for constipation.

It is sedative and works well for insomnia. In moderation, it is healing to the kidneys. The Bible mentions honey as "healing to the bones", perhaps in reference to the stimulation of new white blood cell production.

In cases of hypochromic anemia, take 80-100 grams of honey each day in three divided doses, to increase blood cells and hemoglobin counts.

Honey is alkaline and potassium rich, and helps to counteract the acidity that accompanies arthritis.

Burns of the skin heal with little scarring, and quick pain relief from the application of raw honey.

In short, its properties are antiseptic, diuretic and demulcent- perhaps helping to explain the use of honey for urinary problems. It is also hygroscopic, meaning it dries the area around it. And its hypertonic effect draws water from the bacterial cells, causing them to shrivel and die.

Both gram-positive and gram-negative bacteria are destroyed by unpasteurized honey. Inhibitory effect has been reported for *Salmonella*, *Staphylococcus aureus*, and even the tubercle bacillus. Honey is also effective against MRSA (multiple-resistant *S. aureus*), and clearing up wounds infected with multi-resistant bacteria.

One active principle, inhibine, is an enzyme, glucose oxidase, secreted by the pharyngeal glands of the bee. The formula glucose plus glucose oxidase forms gluconolactone and hydrogen peroxide. The latter is a powerful disinfectant, and gluconolactone equilibrates with gluconic acid, a mild antibiotic. Inhibine is destroyed by light and heat.

Cavanaugh et al, in 1970 found that honey applied twice daily into extensive wounds following operations for carcinoma of the vulva, healed them remarkably well. Fournier's gangrene, a rapidly spreading infection that usually requires aggressive surgery, has also been successfully treated with honey.

Honey on wounds has a natural debriding effect on wounds, so that surgical debridement is either unnecessary or only a minimum cutting of dead flesh is required.

Honey then promotes healthy granulation tissue, which helps the skin regenerate with little or no scarring. Stimulation of new blood vessels in the bed of wounds has also been observed.

A review of 22 clinical trials of more than 2000 patients concluded that honey cleans up existing wounds, protects against infection, reduces swelling and minimizes scarring, as well as speeding up the growth of new tissue. *Int J of Lower Extremity Wounds*, Mar 1 2006.

Honey is used extensively in face packs, face creams and hair conditioners.

It may give great relief in seborrheic dermatitis. It has a number of origins, including excessive protein intake, or inability to breakdown properly, leading to bacteria in the bowel metabolizing these amino acids into cadavrine, putrescine and spermidine. These enter the bloodstream and remove a brake on skin cell growth that multiplies and produces excessive amounts of sebum.

Many medications are implicated including dopamine for Parkinson's, hydralazine for congestive heart failure and hypertension, isoniazid for TB,

penicillamine for kidney stones, rheumatoid arthritis, Wilson's disease and oral contraceptives.

Honey diluted in warm water was applied to 30 patients with chronic lesions of the face, scalp and chest and left for three hours. Itching and scaling disappeared in one week, skin lesions healed in two weeks. Fifteen patients who followed up for six months had no relapses, while 12 of 15 who did not continue honey use had recurrence of lesions in 2-4 months. *Al-Waili, Eur J Med Res* 2001 30 6:7.

Honey is used in numerous cosmetics; including shampoos, moisturizers and skin masks to good effect. Research is currently underway to develop a process of using honey to create alpha hydroxy acids (AHAs). Examples include Johnsons Baby Shampoo, Honey and Vitamin E, Avon Rare Pearls Eau de Parfum spray, and Revlon Professional Cuticle Massage Night Cream.

Honey extracts are used in Suave shampoos, Salon Selectives Conditioner, and Happy Daisy Relaxing Baby Bubbles.

Local honey (raw and unpasteurized) taken for three months in advance of the hay fever season can be taken one teaspoon daily to prevent the unpleasant symptoms.

It will diminish milk secretion in nursing mothers; and may be used for weaning when desired.

In 1936, Professor Haydak set out to subsist for three month's diet of cow's milk and honey (100 grams per litre of milk). His ability to work remained normal, and clinical work showed maintenance of weight, normal bowel movements, absence of protein or sugar in the urine and a slight rise in hemoglobin levels. Only towards the end was a Vitamin C deficiency noticed.

It is used to keep tobacco moist, and to spray on coffee beans during roasting. And of course, it is fermented in the making of mead.

The work of Subremanyam is of interest. It was found that honey has an antiseptic effect that is useful in connection with skin grafting surgery.

A trial comparing honey and silver sulfadiazine, a common burn dressing, in 52 patients with partial thickness burns and found 87% of those treated with honey healed in 15 days compared to 10% using the silver dressing. *British Journal of Surgery* 1991.

Another study looked at wound healing after cesarean section and hysterectomy surgeries. Compared to the group receiving iodine and alcohol, the honey treated group was infection free in fewer days, healed more cleanly and had reduced hospital stays.

Despite the historical and folkloric use of honey in medicine, it was not until 1976, that two physicians, on two different continents conducted clinical trials on incurable bedsores, and burn related infections with 98-99% success in both five year studies.

Honey contains high levels of hydrogen peroxide, a natural antiseptic. Well, actually, glucose oxidase converts glucose to gluconolactate, which in turn yields gluconic acid and hydrogen peroxide. Catalase then converts peroxide to water and oxygen. Pasteurized honey has no such enzyme.

The sugars in honey create "osmotic pressure", literally sucking the water from germ cells so they shrivel and die. And sugars retard collagen growth, which produces scarring. The acidity of honey also prevents ammonia from bacterial metabolism being harmful to body tissues. And of course, honey supplies a wide range of vitamins, minerals and amino acids to the cells for healings.

A study by Cooper et al, Letters in Applied Microbiology, 2000,31:1, revealed all 20 strains of antibiotic resistant *Burkholderia cepacia* in the sputum of cystic fibrosis patients, showed sensitivity to honey. This suggests honey may have a potential role to play in the clinical management of these infections. The enzyme acid phosphatase removes inorganic phosphate from organic phosphates.

Work by Engeseth et al at the U. of Illinois found drinking honey water lead to significant increases in blood antioxidant levels within 60-90 minutes. This same team identified Buckwheat honey as the richest anti-oxidant product.

Work by Al-Walli et al, J Med Food 6:2 found honey taken for fifteen days by 12 adults positively lowered serum levels of thromboxane B<sub>2</sub>, PGE<sub>2</sub>, and PGF<sub>2α</sub> by 48%, 63% and 50% respectively. It also increased serum iron by 20%, copper by 33% and decreased IgE by 34%. The latter is a sign of allergic response.

Honey serves to create a film of liquid between the tissue and dressing, which allows them to be lifted off painlessly and with tearing of re-grown cells.

Pinocembrin, one antioxidant unique to honey, is currently being studied for its antibacterial activity. Other studies have found honey active against *E. coli* and *Candida albicans*.

Honey combined with royal jelly reduced by 50% the minimum inhibition concentration against a variety of bacteria. Boukraa et al, J Med Food 2008 11:1.

Work published in the same journal by Rakha et al, found honey has cardio-protective properties associated with nitric oxide and protecting against ill effect of epinephrine.

In Switzerland, honey was used against sickness resulting from radiation treatment. Buman et al, 1953.

Honey is frequently recommended for feeding and medicating falcons; to make meat attractive to them, to revive tired birds, and to encourage the growth of new feathers in place of broken plumes.

Of course, it is also a quick source of energy, passing into the bloodstream in about ten minutes.

" The taking of honey each day is advised in order to keep the lymph flowing at its normal tempo, and thus avoid degenerative disease which shortens life. The real value of honey is to maintain a healthy flow of the tissue fluid called lymph. When this flow rate slows down, then calcium and iron are precipitated as sediment. When the lymph flow is stagnant, then harmful microorganisms invade the body and sickness appears.

Dr. Jarvis, M.D.

A recent study of 39 weight trained athletes, both male and female, who underwent an intensive workout

and then immediately ingested a protein, as well as sugar, malto-dextrin or honey, found the latter group maintained optimal blood sugar levels throughout the two hours following workout. Muscle recuperation and glycogen restoration was most favorable in those taking the protein-honey combination.

Recent studies suggest a benefit to cardiovascular health. Work by Al-Waili et al, J Med Food 2004 7:1 looked at diabetic, high cholesterol and healthy subjects for 15 days, giving either dextrose, artificial honey or the real thing. In healthy subjects, plasma glucose was elevated at one and two hours and decreased after three. Honey levels elevated for one hour and decreased after three. Elevation of insulin and C-peptide was significantly higher after dextrose than honey.

Honey consumed by healthy subjects for 15 days lowered cholesterol by 7%, LDL by 1%, triglycerides by 2%, C-peptide by 7%, homocysteine by 6% and plasma glucose by 6%. HDL, the good cholesterol increased 2%.

In high cholesterol subjects, it decreased 8% and C-peptide by 75%. In diabetic subjects, honey caused significantly lower plasma glucose.

Work by Mesaik et al, Phytother Res 2008 22:10 found honey taken internally helps modulate immune function during phagocytosis.

Bee bread, a mixture of pollen and honey fed to bees in the hive has been found to contain anti-oxidative properties and inhibit ACE, or angiotensin-converting enzyme, associated with cardiovascular risk. Nagai et al, Z Naturforsch 60.

A 1976 editorial in the Archives of Modern Medicine wrote that honey is in a category of "worthless but harmless substances". Ho hum!

**CAUTION-** Honey may contain Clostridium botulinum spores, harmless to adults and children over one. It should never be given to babies, either raw or pasteurized, as these spores may produce a toxin that causes infant botulism.

For medicinal benefit, it should not be heated above 40 C. It also deteriorates in sunlight, and should be kept dark and cool. When replacing sugar in recipes use 20% more and reduce water by same.

## BEE VENOM

**CONSTITUENTS-** over 40 components including 11 peptides (melittin, apamin, adolapin, and mast cell degranulating peptide); and five enzymes, the most important being phospholipase A. Eighteen components have been found to be pharmacologically active.

When attacked, an alarm substance called isoamyl acetate is released, and detected over considerable distance. Beekeepers avoid this alarm pheromone by using a smoker that generates clouds of smoke, so that it cannot be detected.

The bees gorge themselves on honey, producing a narcotic, tranquilizing effect.

Otherwise, the potential for barbed venom attacks are quite high.

Bee venom therapy (BVT) was first described by Hippocrates while the first modern report is found in the *Lancet*, dated 1910.

In 1888, an Austrian physician Phillip Terc advocated deliberate bee stings to treat rheumatism. In the 1930's, a German firm Mack began commercial bee venom production. They worked out a system where the bees are gently shocked and sting a piece of paper. A Czech company in the 1960s developed a material so thin that the bees can withdraw their stinger and live again. Bees could then inject the paper ten times in only 15 minutes, and the venom is collected.

Many people now practice bee venom therapy for relief of symptoms from arthritis, lupus, cancer and multiple sclerosis. In this therapy, the live bee is placed on the skin until it stings.

In the U.S. alone, it is estimated 5-10,000 sufferers of MS use BVT to ease their disease.

Some practitioners use injectable venom extracted from the honeybee by electric shock; others the live bee. The injection is generally applied to the same trigger points used in acupuncture.

Some therapists combine bee venom with procaine for injection into scar tissue, painful joints, and hair loss. Clinical observations include relief of chronic herpes zoster neuralgia, post 3rd degree, fibromyalgia, bursitis, kidney failure, chronic fatigue, depression and TMJ, or facial pain.

Recent research in Australia attached bee venom to mouse antibodies- creating an antibody that attacked only cancer cells.

Over one thousand papers on this therapy have been produced in the last hundred years, mostly from Europe and Asia.

No one knows how it works but it seems to stimulate the immune and endocrine systems. Studies have shown that bee venom is 100 times more anti-inflammatory than hydrocortisone, or adolapin. It is thought to affect the transmission of messages along the nervous system.

Melittin is a molecule that kills cells by slicing through the cell membranes. A research project in Australia hopes to modify the structure of the molecule to remove the part that causes allergic reaction, while still maintaining the ability to kill cells. Another problem they face is targeting the killing activity to cancer cells only and not to normal, healthy cells. They plan to achieve this by attaching the modified melittin to an antibody molecule that specifically recognizes cancer cells. This combination of a toxin and antibody is known as an immunotoxin. Melittin binds to calmodulin, associated with inhibition of superoxide production.

Research in Germany has shown melittin to exhibit anti-tumour activity. Melittin has recently been found capable of suppressing HIV-1 gene expression, and inhibits infection in both acutely and persistently infected t-lymphoma and fibroblastoid cells at an IC50 of 0.5 to 1.5 microM.

It may inhibit cell associated HIV-1 production at the transcription level.

The therapy has shown improvement in rheumatoid arthritis, multiple sclerosis, depression, chronic fatigue, shingles, skin tumours and premenstrual syndrome.

One study of bee venom therapy on fifty sufferers of arthritis showed 84% benefit. Another, by Masoud et al in Egypt, used bee acupuncture and indomethacin on 40 rheumatoid arthritis patients. After three months, the bee acupuncture group had better results than those taking 50 mg of indomethacin daily.

Also in Egypt, Hegazi et al studied ten patients with multiple sclerosis, four cases quadrapalegic and 6 cases paraplegic. The patients all received honey, pollen, royal jelly and propolis, as well as bee acupuncture for six months, starting with one and moving up to 25 stings per session.

Four out of six paraplegia patients showed improvement in gait, control of bowel, constipation and urination; while three of four quadriplegia patients improved in movement in bed, bed sores, bowel control, motor power improvement, and two cases were able to stand for a few minutes. Both vision and sleep were improved.

In all, bee venom is anti-inflammatory, anti-fungal, anti-bacterial, anti-pyretic, stimulates ACTH, and vascular permeability. It obviously stimulates the adrenal glands to produce cortisol but much remains unknown. Melittin is highly anti-bacterial against both gram positive and negative bacteria.

Adolapin is a painkiller and anti-inflammatory. Apamin enhances nerve transmission, and is believed to be a mood elevator.

The Canadian firm Micrologix Biotech has fused melittin from honeybee venom, with another peptide- cecropin from the giant silkworm moth- and have created a whole new class of antibiotics.

These Bug Drugs function differently, and may prove useful for treating drug resistant bacteria.

Mast cell degranulating peptide (MCDP) is said to rival the effectiveness of hydrocortisone as an anti-inflammatory agent.

Hyaluronidase augments the permeability of the sting site, enhances blood flow and provides some relief.

Work by Kim et al, *J Ethnopharm* 99:2 found aqua-acupuncture utilizing bee venom helps in rheumatoid conditions and production of osteoblast cells.

Bee venom induced apoptosis in human U937 leukemic cells, via activation of caspase-3, 6 and 9. It also down regulates anti-apoptotic protein such as Bcl-2.

Bee venom may also be of benefit in the treatment of liver disease. Park et al, *Arch Pharm Res* 33:2.

Those interested can contact [neuralt@aol.com](mailto:neuralt@aol.com) or [www.beevenom.com](http://www.beevenom.com)

Bee venom has veterinary use. One study by Choi-SeokHwa et al, *Korean J. of Vet Clin Med*, 2000, 17:1 looked at 69 calves with bacterial diarrhea. They found the bee venom more effective than either ciprofloxacin or berberine chloride.

## PROPOLIS

**CONSTITUENTS-** Up to 55% resin and balsam, up to 30% wax, and .3-1.5% fragrant essential oils (eugenol, guaiol, anethole, pinene). It is rich in fatty and amino acids, especially proline and arginine; Beta eudesurol, benzyl benzoate, 3-methyl-but-2-enyl caffeate, caffeic, ferulic and coumaric acid, benzyl-trans-4-coumarate, cinnamyl alcohol, 7-methoxyquercetin, luteolin, apigenin, hydroquinone (0.1%), acacetin, esculetin, zinc, aluminum, manganese, iron, copper, silicon, tin, nickel, vit B.

Also, flavonoids including chrysin, galangine, pinobanksin, pinocembrine, quercetin, iso-kaempferol, kaempferol, iso-quercitrin, and iso-hamnetin.

Caffeic acid phenethyl esters (CAPE) has been determined to be the strongest anti-oxidant. Caffeic acid and its esters comprise from 2-20%.

Propolis comes from the Greek **PRO**, meaning before or protect; and **POLIS**, meaning city; here referring to the hive. In the Old Testament of the Bible it was known by the Hebrew name **TZORI**.

Bees do not make propolis- they gather it. In the north, it is collected from poplar buds and the cracks in bark of poplar, willow, birch and pine trees. The resins are mixed with saliva and placed near the opening of hives to sterilize and protect from infection. Propolis and wax will be used to encase any small animal mis-fortunate enough to enter the hive. Each hive contains from 100-200 grams of propolis. Hives set under the influence of power lines have been shown to increase propolis production to help counteract radiation.

The Egyptians may have studied the bees, because their dead were often buried in mixtures containing honey and wax.

Historically, propolis was used for treating ulcers and sores of the skin by Hippocrates and others. Pliny, the Roman educator said "Current physicians use propolis as a medicine because it reduces swelling, soothes pains in the sinews and heals sores where it appears hopeless for them to mend".

In Rome, every legionnaire carried a small amount to battle, for both speeding up wound healing and analgesic effect.

The Inca of South America used it for febrile infections.

It was used extensively during the Boer War for leg ulcers and battle wounds.

Today, it is used in the Soviet Georgia for buccal and dental infections, and in numerous veterinary medicines. It is added to toothpaste and dental floss. Topical applications to dental sockets show enhanced epithelial growth. Magro-Filho et al, J Nihon Univ Sch Dent 1990 32:1.

The same authors in volume 36:2 found a propolis mouth rinse repairs intrabuccal surgical wounds.

Propolis has been used in the treatment of over 300 conditions, too numerous to list. Those interested are referred to the Apitherapy Reference Data Base, at [www.sci.fi/~apither](http://www.sci.fi/~apither), which contains over 900 titles on the scientific research of propolis. Some are listed below. Burdock et al, Food and Chem Tox 1998 36 give a good summation of its benefits.

Matthew Wood considers propolis a specific for dust and mold allergies as well as laryngitis and hot, raw bronchitis.

More recent investigations show that propolis is effective against bacteria, protozoa (*giardia*), and fungus. Cuban studies have found propolis more effective than tinidazole in treating giardiasis, a common intestinal parasite, also known as Beaver Fever. One study showed a 52% success rate in children, and a 60% rate in adults given propolis extracts. Combining with Oregon Grape Root may be a good combination. Work by Freitas et al, J Phytomed 13:3 has found propolis at 125 mcg/ml inhibits 50% of giardia, and plays a role in detachment from mucus membrane walls.

Recent work by Koo et al, Archives of Oral Biology, 2000, 45:2 showed significant inhibition of several actinomyces species, inhibition of cell adherence and of water insoluble glucan formation.

It has shown laboratory effect against the viruses responsible for influenza, hepatitis B, and avian herpes. Propolis helps prevent recurrent genital herpes. Nolkemper et al, Phytomed 2009 Aug 17.

In studies, it has shown cholesterol-lowering effect, helps impotence, relieves depression, and suggests strong immune enhancing properties. It appears more effective against gram-positive than gram-negative bacteria; as well as *Trichomonas vaginalis*.

Work by Orsolich et al, at the University of Zagreb, Croatia, has shown water-soluble derivatives of propolis are potent inhibitors of metastasis formation in lungs.

Banskota et al, J of Ethnopharm, 2002 80:1 found propolis active against various cancer cell lines.

Work by Sharma et al, Indian J Pharmacol 1997 29 found propolis protective against tetrachloride induced liver toxicity in rats.

Polish studies from 1987 showed that propolis acted synergistically with standard antimycotic drugs like natamycin in killing *Candida albicans*, and *Staphylococcus aureus* isolated from human skin and mucous membranes.

Propolis significantly decreased the toxic side effects of doxorubicin according to work by Tavares et al, Planta Med 2007 73.

Further research in the same country by Scheller et al, in 1990, showed propolis extracts to possess anti-oxidant and free radical scavenging ability.

Work by Bhadwauria et al, Food Chem Tox 46:8 found propolis provide liver protection in a manner similar to silymarin, from Milk Thistle seed.

CAPE has been found to inhibit two enzymes involved in formation of eicosanoids, that produced in excess can worsen arthritis, asthma, psoriasis and allergies. Propolis has been found to inhibit glycosyltransferases, myelo-peroxidase, ornithine decarboxylase, lipoxigenase, tyrosine protein kinase and arachidonic acid metabolism.

Since CAPE's enzyme inhibition has selectively killed precancerous cells mutated by viral infections, and left the healthy cells alone, in cell culture, more research is warranted. Ether extracts possess cytostatic activity against cultured human nasopharynx and uterine

cancer cell lines. Hladon et al, *Arnz Forsch*, 1980 30:1.

CAPE has been found to suppress the growth of human melanoma and glioblastoma multiforme cell line, suggesting anti-tumor activity. Guarini et al, *Cell Mol Biol* 1992 38:5.

One compound, artepillin C, identified by Matsuno et al in 1997, was found to reduce tumours in animal trials by Kimoto et al, *C. Pathol Int*, 2000:50.

A later study by Sugimoto et al, 2003 found artepillin C reduced tumour multiplicity by 72%, when lung tissue was exposed to one of the most powerful carcinogens associated with tobacco.

Researchers have found various CAPE compounds prevent colon cancer in animals by shutting down the activity of two enzymes, phosphatidylinositol specific phospholipase C and lipoxygenase. Both of these are involved in the production of cancer causing compounds.

Work by Orsolice et al, in Croatia in 2006 found CAPE and caffeic acid have pronounced anti-tumor activity, due in part, to immune modulating activity.

Apigenin, also found in chamomile, plantain and other herbs, inhibits hyaluronidase, an enzyme that stops the breakdown of hyaluronic acid. This acid is an important part of the extracellular matrix that holds cells together; preventing invasion of bacteria, viruses and tumours that depend upon this breakdown for opportunistic growth.

Arginine stimulates mitosis and enhances protein biosynthesis, while proline promotes buildup of collagen and elastin, two major components of connective tissue.

A study of 190 rheumatic patients in a single blind, placebo controlled trial showed beneficial effect. Bela et al *Orvosi Hetilap* 1996 137.

The work of Dr. Lavie has shown that there is no propolis more potent than that produced by balsam poplar. He found that various propolis did not possess equal antibiotic effect. He then discovered chrysin, common to both poplar and propolis. He made extracts from the buds and found the activity almost identical, proving this theory. See Poplar for more details on chrysin.

Propolis tincture is invaluable for reducing inflammation of the mucous membranes of the mouth and throat; including tonsillitis. Clinical trials in Austria have confirmed the efficacy of propolis for treating stomach ulcers. For this treatment, fill "OO" capsules with tincture and take two immediately before each meal. This also works well for irritable bowel or spastic colon, again taken before meals.

Work by Dr. Ralph Galen, reported in the *Townsend Letters for Doctors*, about a case of ulcerative colitis that responded to propolis therapy.

Studies in Russia show propolis ointment effective in acne, gum infections and shingle pain.

Work by Filbov et al, *J Nihon Univ Sch Dentistry*, 1990 32:1, found propolis extracts enhanced epithelial growth when applied to dental sockets.

Romanian researchers have published reports of successful clinical trials in wound healing, treating tuberculosis, and fungal infections. Japanese

researchers have found 3-methyl-but-2-enyl caffeate isolated from poplar buds and propolis reduced herpes simplex virus (type 1 or cold sores) replication by 32 fold.

Work by Vynograd et al, *Phytomed*, 2000, 7 found propolis more effective than acyclovir or placebo in treating genital herpes.

Propolis appears useful in treating rhinovirus infections. Szmaja et al, *Otolaryngol Pol* 1989 43.

French research by Amoros et al, *J. Nat Products*, 1992, 55:12 found that propolis combined with bioflavonoids is even more effective.

Some Israeli scientists believe it stimulates interferon production. The work of Heil et al, from Germany postulates that after propolis is taken up in the human body, the phenolic part of the caffeoylic compound in propolis is oxidized to a quinone structure, which then forms covalent bonds with amino acids from either structural or functional proteins. This resulting compound gives it both anti-viral and anti-cancer activity.

Isolated compounds from propolis do not work as well as the synergistic effect of whole product, according to work by Sforzin et al, *J Ethnopharm* 98:3. This should be no surprise to herbal students.

Prostapin is a suppository based on bee products such as pollen, royal jelly, propolis, honey and wax. Saraf et al, in Russia, conducted a clinical trial on 36 male patients suffering acute and chronic prostatitis, 24 males with prostatic-megaly, and 22 female patients with vaginitis. Suppositories were administered once a day for 30 days, with control groups administered placebo.

Nearly 90% of the first group had significant change, with pain relieved, urethral excretions removed, and the function and secretion of prostate, basic blood and urine values normalized.

Prostate size, and improvement was noted in only 67% of second group; while vaginal inflammation in female patients showed 82% improvement.

Work by Song et al, *J of Ethnopharm*, 2002 82:2 found propolis produces estrogenic effect through activation of estrogen receptors. Implication for use during menopause or hormonal cancers in humans has not been determined. The study does suggest that propolis produces estrogenic effect via receptors, and increases uterine weight in lab animals.

The effectiveness of antibiotics such as tetracycline and penicillin has been increased from 10 to 100 times when combined with propolis.

Work by Prokopovitch in Russia (1957), estimated its analgesic strength to three times greater than cocaine and 52 times greater than novocaine. Frenkel, also from the former USSR, used 10-30% concentrations of propolis for surgery of the nose, ear, stoma and dental roots, for both anesthetic effect, and to reduce the risk of post-operative infection.

Propolis is a surface anaesthetic with peripheral action on the mucus membrane of the eye greater than the activity of cocaine, and with infiltrative action equal to procaine. Ghisalberti, *Bee World*, 1979 60.

Its anti-inflammatory properties have been tested successfully in Poland, where it is used to treat

rheumatism. In particular, consider propolis if a viral component is aggravating polymyalgia rheumatica or if joint pains become progressively worse after a viral or lung infection.

CAPE has been shown to be a potent chemopreventative agent that helps combat diseases associated with strong inflammatory or oxidative stress. Frenkel et al, *Cancer Res* 1993 53:6.

Propolis has been shown effective in promoting regeneration of bone and dental pulp, collagen and cartilage.

A 1978 study by Stojko et al, found an increased rate of bone regeneration after treatment with propolis extracts.

This may be due in part to the large amount of proline in propolis that combines with vitamin C to form collagen. This is elastic tissue that attaches bone to cartilage, and gives elastic tone to arterial walls. Other compounds of propolis protect against the deposit of cholesterol crystals, and lipofuscins that accelerate aging of heart muscles, liver and nerves.

Magro-Fiho et al, *Journal of the Nihon University of Dentistry* 1994 suggests propolis for treating a variety of oral and dental complications, including fungal infections (moniliasis), and to encourage postsurgical healing. Dentists in the former Czechoslovakia use propolis to provide temporary pain free dental fillings. Work by Kosenko et al, *Stomatologia*, 1990 69:2 found 4% alcohol solution of propolis added to root canal fillings in cases of severe periodontitis was highly efficacious.

Panova et al, in Sofia, Bulgaria researched the use of propolis suppositories (3%), for treating colpitis endocervicitis, adnexitis, parametritis, and alterations of the trophopathy of genitalia. Two out of 60 women suffered allergic response, while those that continued realized complete disappearance or substantial decrease of the pathological content of the vagina.

Work by Santana et al found in a double blind study that 5% propolis vaginal dressings for ten days had significant positive effect on women suffering acute cervicitis relative to controls. *Rev Cubana Enfermer* 1995:11.

The Chinese have researched propolis and have found it effective in treating hypertension, arteriosclerosis, and coronary disease.

Work by Matsui et al, *Biol Pharm Bull* 2004:27 found propolis exerts hypoglycemic effect, with the compound 3,4,5-tri-O-caffeoylquinic acid the most prominent in activity.

Recently, the popular press has reported the successful use of propolis to treat Alzheimer's. Sister Carole, an English nun was using propolis to help clear up a bacterial chest infection that did not respond to antibiotics.

Not only did the infection clear up after five days, but the Alzheimer's patient became more alert and responsive. Studies on 22 other patients are showing good results.

A recent human study found propolis extract reduced respiratory infection in young children. In a double-blind study of 50 subjects, the propolis group became symptom free more quickly than the control group.

Most importantly, propolis shows no effect level (NOEL), meaning it has no known toxic levels. In 1998, Burdock and Associates published in *Food Chemistry and Toxicology* that over 90 days of feeding 1400 mg/kg of body weight per day showed no ill effect on mice.

In studies on calves, with neonatal diarrhea, propolis was as effective as enrofloxacin in reducing symptoms.

Propolis is used in some soaps and cosmetics, and in varnishes for high quality violins, or at least that is what Stradivari believed. It is used to repair accordions.

**DOSE-** raw propolis the size of a corn kernel is chewed for sore throats or upper respiratory complaints. *Salvia* activated by the resins moves throughout the entire region.

For tinnitus, take four parts olive oil to one part propolis tincture. Soak a plug of cotton batten and insert into ear for 36 hours.

Propolis differs greatly between fresh and aged product. For example, it takes a minimum fresh propolis of 80 ug/ml to inhibit *Bacillus subtilis* and *Staphylococcus aureus*, but 100 ug/ml in aged. Flavonoid content is 20% less in aged propolis.

Propolis from Cottonwood Poplar appears to be more highly sensitizing and capable of allergenic reactions. The scent is due to the content of cinnamyl cinnamate.

## POLLEN

**CONSTITUENTS-** amino acids, enzymes, every known vitamin, and rare trace minerals. It also contains more than 5,000 enzymes and coenzymes, according to Susan Smith Jones. It contains up to 23% protein; is rich in pantothenic acid and B12, with a pH of 6.

Flower pollen is gathered by bees, in the process of gathering nectar. Back at the hive it is shaped into grains and used as nourishment for young larvae. When fed pollen, the larvae increase their weight by 1500 times in less than one week.

These small orange, yellow and brown grains, upon closer examination, exhibit every colour of the rainbow.

Fireweed pollen is turquoise, Snowdrop the colour of a chicken egg yolk, Red Dead Nettle pollen is blood red, Asparagus is bright plastic orange, Raspberry is grey and Oriental poppy, bright blue.

It is nutritious for humans; and contains all five major tastes- sweet, spicy, salty, sour and bitter. More chemical constituents are found in pollen than any other concentrated food on the planet.

The 1948 *Journal of the National Cancer Institute* noted "the development of mammary tumors in mice can be decreased by the ingestion of pollenized food". Recent experiments with pollen have shown incredible potential for the production of SOD, or superoxide dimutase. This free radical quencher is useful in reducing inflammation and prolonging the aging process. It is, however, destroyed by stomach acids.

An experiment by Robert Delpere of the Royal Society of Naturalists of Belgium and France, fed rats

on bee collected pollen and water for several generations, with all remaining healthy and fertile.

In one study at Long Island University, 189 patients with rheumatic knees and elbows received significant relief with bee pollen poultices.

Pollen is used for impotence, and prostate inflammation. A study conducted in 1995 in the Journal of Medicinal Chemistry showed that one fraction of pollen extract, designated FV-7, inhibited the growth of prostate cancer cell lines. After all, pollen is THE male reproductive substance of plants.

It is rich in aspartic acid for rejuvenating the sex glands. Other hormonal content includes gonadotrophic hormones similar to those produced by the pituitary. Acetic, butyric and propionic acids provide energy for the liver.

Bee pollen extracts show significant improvement in menopausal symptoms including headache, urinary incontinence, vaginal dryness and decreased vitality, in various double blind studies.

Pollen possesses antibiotic effect, as well as giving allergy relief. Various flower pollen allergies in your own region can be effectively neutralized by ingesting small amounts of local pollen prior to the allergy season. Dr. Leo Conway of Denver, Colorado has compiled over 60,000 documented cases of the successful use of local pollens for treating allergies.

Work by Ishikawa et al, J Med Food 2008 11:1 found bee pollen inhibits the IgE receptor mediated activation of mast cells, suggesting a pathway for alleviation and prevention of allergies.

Asthmatics should approach the use of all bee products with some caution as they are powerful foods. It can be used in cases of chronic fatigue syndrome to good success.

Bee pollen supports low blood pressure, but it contraindicated in cases of hypertension. Recent German studies have reported a lowering of cholesterol and triglycerides with regular daily intake of pollen. It has been shown by Dr. Kilmer McCully of the Harvard Medical School, that heart disease is often initiated by B6 deficiency and a methionine increase. It follows that foods with a high B6/methionine ratio may help prevent some heart disease. Carrots are 15 to 1, bananas are 40 to 1 and bee pollen is 400 to 1.

A recent study showed that taking bee pollen before meals, reduced food consumption by 15-20%, assisting in weight reduction.

It allays depression, and increases hemoglobin and calcium retention.

It boosts the immune system; and is helpful in reducing the side effects of chemotherapy and radiation, treating cervical cancer.

It also helps sleep disorders, nausea, urinary and rectal dysfunction.

When pollen was taken three times daily with meals for three days before, during, and following radiation treatments, patients did not suffer side effects such as hair loss.

Bee pollen contains as yet unidentified compounds that slow the growth of breast cancer.

According to Smith, it is effective in treating constipation and colitis, diverticulosis, coli bacillosis, anemia, circulatory disorders, neurasthenia, skin fragility and hair loss.

At an annual Congress of Physicians in Stockholm, impressive results for the treatment of encephalitis, hepatitis, bronchitis, and some forms of sclerosis were presented.

Russian studies by Georgieva et al, 1971 showed bleeding gastric ulcers responded to pollen therapy. Chinese experiments by Peng et al, J Chin Med 1990 70 investigated the use of pollen to help high altitude sickness (hypobaropathy). It was concluded that pollen increased the ability to adapt to high altitudes with low oxygen content.

There is one note of caution. Insulin and bee pollen should probably not be used at the same time; that is, bee pollen is contraindicated in some forms of diabetes.

Use local pollen, as imported pollen is sterilized and radiated, and therefore lacking many enzymes and nutrients. It may also contain heavy metals, particularly from countries like China.

Bee pollen has a hard membrane that cannot be digested by enzymes in the human body. Therefore it must be well chewed, or crushed into a very fine powder and then put in capsules.

Bee pollen is used in cosmetic applications due to its restoring, dissolving, softening, anti-infectious, anti-inflammatory, and tissue repair properties. It is very useful in formulas for skin ulcers, scabs, sores, boils and abscesses. In concentrations of 0.0008-0.004%, pollen extracts significantly improve cell proliferation. Bee pollen, added at the rate of 1.5% to the rations of broiler chickens, promotes earlier development of digestive system.

The villi, for example, increased in length by 37%, suggesting an investment would lead to increased nutrient absorption in later life. Wang et al, J Med Food 10:2.

## **ROYAL JELLY**

**CONSTITUENTS-** water (66%), protein (12%), royalisin, lipids, thiamin, riboflavin, niacin, pantothenic acid, B6, biotin, inositol, folic acid, vit C, gamma globulin, acetylcholine, and up to 15% of HDA or 10-hydroxy-trans-(2)-decanoic acid, methyl paraben, 3-hydroxydodecanedioic acid, sebacic acid, and neopterin.

In the larval stage, there is absolutely no difference between a queen and worker bee. In the first three days of life, the larvae are fed special milk by the nurse bees, secreted only from the sixth to tenth day of life from their hypo-pharyngeal gland. This is called royal jelly.

It is similar to the beebread that is a mixture of pollen, honey and worker bee secretions, but contains ten times more pantothenic acid and bipterin, as well as the secretions.

Royal jelly is milky-looking, acidic, protein rich, and possesses the highest natural source of pantothenic acid (B5); 20 times higher than liver. This is

invaluable in certain forms of asthma and prevention of hay fever.

It is so potent that only the next queen continues to be fed this special delight. She continues to grow 50% larger and lives forty times as long.

China is the world's largest producer with approximately 500 tons exported annually. It is French beekeepers in the 1950s that pioneered commercial use by creating artificial queen cells and sucking out the jelly with small pumps. One hive produces just 7 ml and hence the high price.

Besides B5 and B6, royal jelly is also the richest natural source of acetylcholine. This fluid allows the nerve impulses to pass from one nerve to the next. Deficiency of the substance is often found in the tangled nerve bundles of patients suffering Alzheimer's and other nerve related disorders.

Royal Jelly does essentially four things. It strengthens the body, builds up immunity to disease, treats anemia and increases personal stamina.

It has been found to possess anti-tumour activity in experimental laboratory mouse leukemia, due to effect of medium chain hydroxy-fatty acids.

Some menopausal women find royal jelly and bee pollen a potent combination in smoothing the hormonal transition.

Recent work by Mishima et al, J Ethnopharm 101:1-3 found royal jelly's estrogenic activity was due to interaction with estrogen receptors followed by endogenous gene expression.

Royal jelly helps improve hair, nails and skin. A recent study by Krylov et al in Russia with Vasilisa, on a cream with 0.5% propolis and 2% royal jelly, showed good results treating skin conditions after just 5-7 days.

It is a proven anti-viral and anti-bacterial substance, effective against staph and strep infections. HDA is 25% less active than penicillin, and seems to be pH dependent.

A new potent antibiotic protein, royalisin, has been isolated by Fugiwara et al, and reported in J of Biol Chemistry, 1990, 265; 19. It is active against gram positive, but not gram-negative bacteria.

The component 3-hydroxydodecanedioic acid is active against *Staphylococcus aureus*, *S. epidermidis*, *Streptococcus mutans* and *S. viridans* in the range of 0.17-0.36 mg/mL.

Sebacic acid shows moderate anti-fungal activity.

It accelerates bone tissue formation, lowers cholesterol, as well as regulates and normalizes blood pressure by making the arteries more flexible.

It inhibits ACE, or angiotensin converting enzyme, associated with cardiovascular risk. Nagai et al, J Food Ag Envir 2009 7:2.

In one human study, a dosage of 50-100 milligrams daily decreased total cholesterol levels by 14% in patients with moderate to severe elevations ranging from 210-325 mg/dl. A better quality product may have produced even more significant benefit.

Work by Hidaka et al, eCAM 2006 3:3 found royal jelly helps prevent osteoporosis by enhancing intestinal calcium absorption. Although a rat study,

royal jelly was 85% as effective as 17beta-estradiol in preventing femur bone loss.

The compound 10-hydroxy-2-decenoic acid appears to benefit RA, or rheumatoid arthritis. Shang et al, J Ethnopharm 128:2.

Apinhalin, is a suspension inhalant with royal jelly and propolis, used in Russia for bronchitis and bronchial asthma. It is used in cosmetology for different skin diseases such as blackhead rash, herpes and dermatitis, as well as more serious conditions like diabetic foot or leg ulcers.

Royal jelly regulates low blood sugar and encourages the breakdown of fatty, adipose tissue; thus aiding weight loss regimes. One study in the Lawrence Review of Natural Products (1992), suggests that royal jelly can affect the adrenal cortex and produce hyperglycemia.

Neopterin, also known as 2-amino-6-(1,2,3-trihydroxypropyl)-4(3H)-pteridinone) is found in royal jelly and humans, where it appears to play an important, and yet, unexplained role in the immune system.

Apalbum 1 from Royal Jelly exhibits anti-hypertensive activity. Work by Tao et al, J Ag Food Chem 2008 56:20 investigated implanting this compound into silkworm larvae for possible commercialization.

**NOTE-** Because of its volatility, royal jelly must be kept chilled, frozen or freeze dried to retain any potency. It should be stored fresh at 4 C, or frozen below -17 C to retain any nutraceutical or functional value.

It takes a thousand three day old Queen cells to harvest a pound of royal jelly. Furosine is the marker associated with freshness and quality, the lower the number the better. Highest anti-oxidant levels are noted in royal jelly harvested 24 hours after larval transfer. Liu et al, J Ag Food Chem 56:23.

There has been one case of fatal royal jelly induced asthma, reported in the Medical Journal of Australia 1993-94. Allergic reactions are generally rare; in fact a study by Jian-Guo suggests that pure natural royal jelly should not cause allergic reaction. Work by Thien et al, Clin Exp Allergy, 1996,26 found nearly half of patients with food or respiratory allergies demonstrated IgE antibody reactivity to royal jelly proteins.

**DOSE-** 0.3 grams daily.

## BEE LARVA

Many ancient peoples used bee larvae for food. They contain more vitamin D than fish oil, by weight.

In Chinese medicine they are good for the stomach and spleen, and reputedly beneficial for leprosy.

Bumble Bee larva, known as **TU FENG**, is indicated for swollen infected boils.

In Romania, two patented products called Apilarnil and Apilarnilprop are produced from the drone honeybee larvae.

The adult honeybee contains potent anti-bacterial peptides, apidaecins and abaecin. Casteels et al, Eur. J. of Biochemistry, 1990, 187:2.

Bee larvae, known as **FENG ZI**, are used in TCM, and is a sweet and balanced medicine, used for head wind, to eliminate toxins and supplement vacuity and languor.

## **BEE'S WAX-CERA FLAVA**

**CONSTITUENTS-** myricin (up to 80%), cerolein, myricyl alcohol, fatty acids, cerotic and aliphatic acid, lactones, pollens and resins, cholesteryl esters. It melts at 62-64 degrees C, with a saponification value of 87-104, ester value of 70-80, and acid value of 17-24. The specific gravity is 0.967.

Wax is secreted from the abdominal rings or scales of the bee, and is used to form cells where food or eggs are kept. It is extracted by boiling the honeycomb in water and skimming the wax from the surface. An estimated ten pounds of honey are consumed to produce one pound of wax, leading to the hexagonal frugality of the comb.

Vergil says that Pan made his pipes by "joining with wax the unequal reeds".

The ancient Egyptians used wax for the airtight seal on urns, jars and coffins. The Persians and Syrians both covered the bodies of important dead with wax before burial. A cere cloth was wax impregnated and wrapped tightly around bodies to keep out the air.

The Romans found that wax covered wooden tablets were ideal for writing notes and letters. They also used the wax to seal legal documents; as official seals are used today.

Throughout Europe, beeswax has been used for birth, circumcision and marriage.

Later wax was used for casting molten metal statues, and eventually for the famous Tussaud wax museums. Ceromancy is the art of divination by dropping melted wax into water, and reading the future by observing the shapes formed.

Traditionally, wax was much used for eye salves, and today for ointments and salves.

In China, beeswax is dissolved in hot wine and is drunk for diarrhea, hiccups and inflammation. It is considered a great vaccine against hay fever.

The antibiotic present in beeswax is active against certain types of entero-bacteria.

In the West it has mainly found use as an emulsifier and thickener in cosmetics or candle making. It is also used for dressing and polishing leather and furniture, modeling fruits, transparent papers, engraving and lithography, chewing gum, food products and finishing textiles. Clapham's Beeswax Products is a British Columbia company that specializes in beeswax hand creams, as well as salad bowl and furniture polish products.

They can be contacted at [roger\\_clapham@bc.sympatico.ca](mailto:roger_clapham@bc.sympatico.ca).

Revlon, Cover Girl, Aussie, Avon, Ponds, and, of course, Burt's Bees use the wax in a variety of personal care products, from mascara, to lip liner and lipsticks, to night creams and moisturizers.

In Arabia, Avicenna used beeswax for ulcers of the bowels and to increase the flow of urine and semen.

It stimulates the stomach and relieves heart pain. Honey and wax are both yin and considered restorative to the spleen.

Dogs, given the opportunity, will choose beeswax as a natural antibiotic, and will eat it. Caroline Ingraham, in The Animal Aromatics Workbook, writes "I have noticed that dogs with ear infections and gastrointestinal problems relating to infection (indicated by diarrhea) frequently choose beeswax, especially with rosehip extract added.

Myricyl alcohol, one of the constituents, has been shown to be a plant stimulant; increasing yields of tomato, cucumber and lettuce.

Beeswax has long been praised for slowing the aging process, increasing potency and desire for love, and invigorating both physical and mental capacity.

Beeswax is the only fuel that can be burned safely in closed quarters; and the only fuel on the planet that emits negative ions.

Originally, the mass candles used by the Roman Catholic church had to be 100% beeswax. In 1851, this was reduced to 65%, later to 51% and now to only 25%; corresponding some would say in direct proportion to church attendance.

German artist, Wolfgang Laib sculpts with slabs of beeswax, building four metre towers like ziggurats, ancient Assyrian temples. He uses the wax to build narrow chambers, with an electric bulb to warm the wax and release the honey scent. His works sell for up to \$150,000. His most ambitious project is a beeswax chamber tunneled twelve metres into the Pyrenees near Marcevol, France.

Closer to home, Aganetha Dyck is an artist from Manitoba that collaborates with bees to produce art. She places objects into hives and then waits for bees to transform them by building cells of wax and honey. Some projects take several years to complete.

Working in the Dark, produced in 2000, is a poem by Di Brandt put into Braille and placed in a beehive. When the 54 lines of poetry came out, the bees had made a new language of this translation. More recently, she is working with her son, Richard Dyck, who is a multimedia computer artist, recording the sounds within beehives.

In Ukrainian folklore, bees are believed to have a special relationship with God. Beeswax ceremonies were traditionally performed by Babas who poured molten wax into cold water held over the patient's head. When the dish is overturned, the wax formation is interpreted to find the source of the health issue. Rena Hanchuk conducted over 400 hours of interviews with 23 patients for her thesis in 1994 at the University of Alberta.

Amongst the Kayapo of Brazil, a ceremonial hat is formed from beeswax to symbolize the universe. These are worn by young men, when they receive ceremonial names.

Policosanol is a very effective plant wax, derived from sugarcane. Extensive studies, from Cuba, suggest it

can reduce both total and LDL cholesterol by 10-20%, as well as modestly elevate HDL.

Policosanol can also be derived from beeswax; and because sugar cane wax is less available to U.S. companies, and patent protected; the beeswax derivative may be a good substitute. No studies have yet been conducted, but the supplement company Hauser has recently purchased the rights to this policosanol isolating technology.

Policosanol is composed of long chain primary aliphatic saturated alcohols, the main one being 28 carbon 1-octanisol.

The product may reduce total serum cholesterol and LDL levels in some people. It may help reduce platelet aggregation and benefit in intermittent claudication.

In one recent human study LDL cholesterol was reduced by 24% compared to 22% for lovastatin and 15% for simvastatin. The HDL level increased in the policosanol group, but not the two drugs suggesting a "safe and effective cholesterol reducing agent".

At a dose of 20 mg. daily, policosanol appears as effective as 100 mg. of aspirin for reducing platelet aggregation.

## HOMEOPATHY

### *Apis mellifica* (HONEY BEE)

**CONSTITUENTS-** melittin in both the venom and body.

The familiar stinging, burning pain of a bee sting, along with the live welt it produces are the key symptoms to Apis.

Any acute inflammation, accompanied by stinging and burning, marked redness, swelling and heat calls for Apis.

Lupus erythematosum, chronic nephritis, pharyngitis, and ovaritis are some examples of inflamed, and swollen conditions relieved by Apis.

Dr. Eli Jones suggested this remedy in breast cancer where there is induration and the skin is dark purple, with light yellow discharges.

Sore throats, hives, conjunctivitis, styes, as well as all insect bites and stings are relieved with Apis.

The most typical swellings have a puffy, water-filled appearance.

The inflamed eye with a sty looks like a red bag of water- as if stung by a bee. The throat may appear red, sore and puffy.

Those requiring Apis generally have little thirst, although some crave milk. They may be sad, depressed, or weep constantly, for little reason.

Ovarian inflammation may be worse on the right side, with swollen and red labia that feels better from the application of cold. Sometimes, children that need Apis cannot easily urinate; and are anxious, mutter in their sleep, or are restless and suddenly awakened from sleep.

**DOSE-** Tincture to the 30th potency. In edema, the lower potencies are best. Sometimes the action is slow. For breast cancer indicated above, use 3X at rate of twenty drops to four ounces water. Give one teaspoonful every hour.

Apis mother tincture is created in one of two ways. Live honeybees are put in a bottle and irritated by shaking. For eight days the bottle is open long enough to add diluted alcohol. It is then shaken to anger the bees and get them to emit venom. When they die, the alcohol is poured out, strained, filtered and is the mother tincture.

The other method involves a drop of bee venom secreted with help of tweezers. This drop is then added to dilute alcohol. In a sense, the remedy is a sarcode (made from a live animal) and first created in 1852, by Dr. Frederick Humphries.

### **MEL CUM SALE (HONEY WITH SALT)**

This homeopathic remedy is specifically for prolapsed uterus with inflammation of the cervix. The special symptom is a feeling of soreness across the hypogastrium from ileum to ileum.

Accompanying this is a sensation as if the bladder is too full; with the pain moving front to back.

**DOSE-** 3rd to 6th potency as needed.

## MATERIA POETICA

Honey bee so busy  
I hope you will not sting  
Puff me up with redness  
Swollen painful thing  
Heated like a fire  
Give me something cool  
To settle down this burning pain  
Inflamed, out of control  
Active little worker  
Buzzing round the hive  
I hate to make you angry  
I think I'd rather hide  
You've got a robust way  
Of taking full control  
A swelling up with vigor  
Your stinging takes a toll  
I've never seen you drinking  
You certainly lack thirst  
And when I think of anaphylaxis  
You're practically the worst  
Oh Apis, go ahead  
I'll stay out of your way  
I'll never make you jealous  
You can work away your day!

**SYLVIA CHATROUX MD**

## ESSENTIAL OILS

**HONEY OIL** is an absolute produced by extraction from the honeycomb. The best solvent is 95% ethanol which leaves no toxic residue.

It contains palmitic and hydroxy-palmitic acids.

Honey essential oil has a fragrance that is mild, warm and sweet. It is calming, relaxing and balancing. It may be added to a therapeutic bath for relieving colds.

## **BEESWAX ABSOLUTE**

**CONSTITUENTS** cerolein, cerotic acid,

Beeswax absolute is made from the fresh wax by an alcohol washing. It is mild, oily, and coumarin-like. It yields about 0.1-0.2%. It is reminiscent of good cold pressed linseed oil with a honey trace. In perfume work it is a mellow and modifier of harsh synthetics, and called "absolue cire d'abeille".

A good aromatherapist or perfumist can tell what country or harvest of flowers was associated with the formation of the beeswax.

Beeswax absolute is used in perfumes to knock off the rough or chemical corners of synthetic materials. It blends well with orris, violet, and some meadow like blends.

It is used as flavouring in some alcoholic beverages.

Given the magnitude of the honey industry in Alberta, particularly the Peace Country, a good quality product that can compete on the world market would seem to be a good value added venture.

Propolis essential oil is obtained from steam distillation, and yields from 0.3-1.5%. Composition varies according to the vegetation of the surrounding area, but generally is composed of 40-60% sesquiterpene alcohols like beta eudesmol, quaiol, farnesol, and nerolidol; and from 20-40% of benzyl benzoate, as well as beta-bisabolene, patchoulane and thirty other compounds.

The first dominates in poplar forests; the second in pine regions.

Propolis oil shows good to moderate activity against both gram positive and negative bacteria and various fungi.

In 1998 studies conducted by Damianova et al, in Bulgaria, propolis absolute was found to have a higher fixing ability than conventional fixatives in perfumery.

## **HYDROSOL**

Honey water is leftover from the steam distillation mentioned above. It has a limited, but steady, retail aromatherapy market.

Dr. Fernie mentions honey water is an excellent wash for promoting the growth of hair, either by itself or mixed with spirit of rosemary.

A toilet water very popular in England and France during the 18th century and known as Aqua Mellis, contained honey, coriander, rosewater and other exotic spices.

Brunschwig, in his 1530 Book of Distillation, mentions honey water for restoring and growing hair, old sores and holes, unclean wounds, and eyes.

"Put as much as you will in a crooked glass named retort and stop it well fast and leave forty days in horse dung, that is changed every week. Then put the glass in a wand and distill...the first water is white and clear, put away. The second is yellow and that we shall keep".

## **SPIRITUAL PROPERTIES**

Wax is an important element in Ukrainian folk rituals. Its special symbolism is related to its production by bees, sometimes affectionately called "God's birds" or "God's flies". Beekeeping has a long history in Ukraine, where wax and honey have historically been important commodities.

In most descriptions, melted wax is poured into cold water...although the wax ceremony is said to cure many different maladies, it is most commonly used as a cure for fear...untreated fear is thought to manifest itself in emotional and mental illness.

### **HANCHUK**

There were two adult bees [sewn into each of my mittens], and baby bees were put there as well. These were there so that when a woman in labour has complications I could help ease the delivery.

**SIMON INUKSAQ**

## **PERSONALITY TRAITS**

The bee is an incredibly restless insect that reacts instantly and angrily to any outside interference. It is sensitive to heat and has elaborate systems for cooling down a hive.

In fever, a person may be weepy for no apparent reason. They may be restless and fearful, regarding death or the fear of being left alone. Generally, the Apis personality is quite jealous. A child in a family with a new baby exhibits many of these symptoms. Ironically, they also dislike being touched.

### **PRAIRIE DEVA**

The honeycomb is perfect six-sided hexagon. To the early Pythagoreans, the hexagon was an expression of the spirit of Aphrodite, whose sacred number was six (dual Triple Goddess).

They worshipped bees as her sacred creatures, as they made perfect hexagons.

In Aphrodite's temple at Eryz, the priestesses were **MELISSAE**, or bees.

The Goddess was also called Melissa, the queen bee who annually killed her male partner, and a golden honeycomb her symbol.

As the pythagoreans meditated on the 60° angles, they continued the lines until they met in the centre of adjacent hexagons. This signified, to them, the underlying symmetry of the cosmos.

Honey cakes formed like female genitals were prominent in worship.

This led to medieval hymns that addressed the virgin Mary as a "nest of honey", and "dripping honeycomb".

Bees are hymenoptera or "veil-winged", recalling the hymen or veil that covered the inner shrine of the Goddess's temple, and the officiating nymph called Hymen who ruled over marriage rituals and the honeymoon.

#### **WALKER**

There is a certain sense, said Steiner, in which the individual bee, whether it is a worker, a drone or even the ruling queen, is not an organism in its own right. It is a constituent element of the true organism, the hive as a biological entity.

Save in exceptional circumstances its temperature is maintained at a constant level which approximates to the 37 C of the healthy human being. Rudolf Steiner's intuitive faculties induced him to attach significance to this fact...he taught that the coincidence of temperature between the hive and the individual human being indicates a certain relationship between the latter and the Ego. Another subtle relationship discerned by Steiner was based on the similarity between the regular six-sided cells of which the honeycomb is made up and the hexagonal crystals of various naturally occurring mineral substances.

Anthroposophical medical practitioners see the polarity of the hive as reminiscent of the polarity tendencies of the Ego in the human bio-system- a hardening, mineralizing, sclerotic tendency manifesting itself as the cephalic pole; a softening, warming tendency manifesting itself at the motor-digestive metabolic pole.

#### **KING**

The symptoms of a bee sting—burning, stinging, redness and swelling—and the activities of bees—collecting nectar, converting it into honey, living in hives, building exactly similar honey combs, all serving the queen and the whole family working in harmony, stinging with poisonous venom in defense, flying about slightly erratically—all point to its people picture.

Family orientation is No. 1, so love of family is the first idea. They are busy looking after the family and love them all "to bits". It's just natural for them to be busy looking after and controlling and defending the family.

She is a straightforward person with straightforward sets of activities or tasks. The busy-ness can move toward workaholic tendencies, and they can also be frivolous and fruitless in their family-oriented activity. There is awkwardness, especially dropping things and restless activity. Dreams of flying are typical, but more likely it's an indication for one of the bird remedies. The mother is protective jealousy and irritability, and you can expect to be stung if you cross this person... The golden thread of this remedy is caring for family, the spiritual core is love, the emotion is caring love, and the defense of this by stinging in some way; that's how it feels to the

recipient. The physical result is busy activity in support of the family and the physical pathology is immune protective swelling and inflammation that is caring and protecting on the cellular level.

#### **PETER CHAPPELL**

## **MYTHS AND LEGENDS**

These holy bee-maidens, with their gift of prophecy, were to be Apollo's gift to Hermes, the god who alone could lead the souls of the dead out of life and sometimes back again. The etymology of the word "fate" in Greek offers a fascinating example of how the genius of the Minoan vision entered the Greek language, often invisibly, as well as informing its stories of goddesses and gods.

The Greek word for "fate", "death", and "goddess of death" is **E KER** (feminine); the word for "heart" and "breast" is **TO KER** (neuter); while the word for honeycomb is **TO KERION** (neuter).

The common root **KER** links the ideas of the honeycomb, goddess, death, fate and the human heart, a nexus of meanings that is illumined if we know that the goddess was once imagined as a bee.

#### **BARING**

In the Ukraine, bees are the tears of our Lady, and the Queen Bee of any hive is called Queen Tsarina, a name associated with Mary, Queen of Heaven. Throughout Eastern Europe, Mary is the protectress of bees and beekeepers, and consecrated honey is offered on altars on the Feast of the Assumption of the Virgin Mary on August 15, the date linked with her ascension into heaven.

#### **EASON**

## **RECIPES**

**PROPOLIS TINCTURE-** Take 40-70 grams of dry propolis and macerate for 3 days in 100 ml of 95% alcohol. Shake daily. Use 4-5 drops three times daily. Use more frequently in acute cases. Commercial products standardized to 1.8%-2.2% total flavonoids as galangin are available from European firms.

**OINTMENT-** Five parts of propolis powder and olive oil. Combine with 2 parts lanolin in top of double boiler. Stir under smooth. Remove from heat. Use for burns, shingles, ear infections, and skin problems. Do not use on wet eczema.

**BEE POLLEN POULTICE-** Dissolve one tablespoon of pollen in warm water. Place a cotton towel in water. Wring out and applied to affected joint.

**BEE POLLEN-** one quarter to one tsp. daily as indicated. Should not be taken in cases of hypertension, during pregnancy or breastfeeding or by diabetics taking insulin.

**SCRAMBLED BROOD-** Squeeze freshly sealed brood comb through a colander to obtain a puree of

the larvae and pupae of honeybees. It looks and cooks up like scrambled eggs, only whiter.

**STEAMED BEE BROOD W/ CHILI-** Cut three inch squares of sealed brood comb (fresh). Use new combs to avoid pollens or cocoons from previous generations. Wrap in aluminum foil and steam for 7-10 minutes. The brood will cook and the wax will melt and mix. Add chili sauce for dipping.

**RECOMMENDED READING-** The Sacred Bee by Hilda Ransome is a 2004 reprint of classic 1937 history of this fascinating insect.

The International Bee Research Association in Cardiff, Wales has a library of 60,000 papers, 4,000 books and 130 journals on the subject of bees.