

ROYAL JELLY



ROYAL JELLY

- Royal jelly has been known about for ages but has only been available in the last 50-60 years in quantities large enough for human consumption.
- China is the largest producer (over 2000 tons) and consumer (about 1000 tons).

Why are the Chinese so interested in Royal Jelly and why should we care?

- There are legends of Chinese rulers who enjoyed remarkably long lives and great sexual prowess as a result of a diet high in royal jelly.
- If that is not enough...

Royal Jelly is reported to

- Stimulate better memory and mental function
- Increase sexual vitality and rejuvenation
- Increase vigor and physical strength
- Regulate and balance hormonal activity and increase fertility
- Normalize blood pressure
- Improve skin smoothness and elasticity
- Regenerate bone tissue
- Promote building of soft tissues and muscles
- Enhance wound healing
- Decrease arthritic symptoms
- Protect the liver
- Decrease depression and calm anxiety
- Stimulate the immune system to fight infections and tumors
- Lower cholesterol and blood lipid levels
- Stimulate production of red blood cells
- Prevent hair loss
- Help in some CNS disorders including Parkinson's Disease

Where does Royal Jelly come from?

- Honey is processed into Royal jelly in the hypopharyngeal and mandibular endocrine glands of nurse bees between 5 and 15 days old.

What makes a queen?

- All bee larva are fed royal jelly for the first three days after they are laid. Thereafter, only those larva destined to become queens get royal jelly.
- With royal jelly a larva turns into a queen bee which can live for up to 6 years and can lay up to 2500 eggs a day. She is fed only royal jelly for the rest of her life.
- Deprived of royal jelly a larva turns into a worker bee with a life expectancy of 6-8 weeks.

Mechanism of RJ Effect on Bees

- Queen and Worker bees have the same DNA
- An unknown component in RJ silences a specific methyltransferase gene which adds methyl tags to DNA in the larvae destined to be workers.
- Nutritional Control of Reproductive Status in Honeybees via DNA Methylation, Kucharski, R., Science, 2008 Mar 28; 319(5871):1827-33

Queen Bee

- Eats royal jelly
- Grows in 15.5 days
- 17 mm long
- 200 mg
- Lives 4-6 years
- Sting is curved and smooth
- Defends her position

Worker bee

- Eats honey and pollen
- Grows in 21 days
- 12 mm long
- 125 mg
- Lives 4 to 6 weeks
- Stinger is straight and barbed
- Defends her colony

Queen Bee Longevity

- A 3-fold difference in the peroxidation resistance of their phospholipid membranes accounts for the order of magnitude difference in the longevity of queen honey bees compared to worker bees.
- Haddad LS, Kelbert L, Hulbert AJ. Exp Gerontol. 2007 Jul;42(7):601-9.

Royal Jelly Production

- In honey trace and mineral element concentrations varied substantially depending on botanical and geological origin.
- In the associated royal jelly samples the concentrations of trace and mineral elements were highly constant.
- **Thus, bees are able to make homeostatic adjustments of trace mineral and element concentrations in royal jelly.**
- Trace and mineral elements in royal jelly and homeostatic effects. Stocker A, Schramel P, Kettrup A, Bengsch E, J Trace Elem Med Biol. 2005;19(2-3): 183-9. Epub 2005 Oct 24

ROYAL JELLY- Composition

- Water- 67%
- Proteins- 13%
- Sugars- 11% Fructose 6%, Glucose 4%
Sucrose 1%
- Fatty Acids 5% shorter chains than usual
for insects 8-10 carbons vs. humans 14-20
- Minerals 1% Ca,Cu,Fe,Mg,Mn,Na,K,Zn,Si
- 7-9 different sterols-sitosterol, cortisol, cholesterol
- 4 phospholipids from which cell walls are made
- 5 glycolipids which provide energy

Vitamins in Royal Jelly

- Only trace or insignificant amounts of vit B12, vit C, and lipid soluble vitamins A,D,E and K

According to US Dept of Agriculture Royal Jelly has

- | | | |
|-------|------------------|-----------------|
| • B 1 | Thiamin | 1.5-7.4 mcg/gm |
| • B 2 | Riboflavin | 5.3-10 mcg/gm |
| • B 3 | Niacin | 60-150 mcg/gm |
| • B 5 | Pantothenic Acid | 65-200 mcg/gm |
| • B 6 | Pyridoxine | 2.2-10.2 mcg/gm |
| • B 7 | Biotin | 0.9-0.5 mcg/gm |
| • B 9 | Folic Acid | 0.16-0.5 mcg/gm |
| • B12 | Cobalamin | 0.015 mcg/gm |
- Royal jelly is the richest natural source known for Vit B5

Other components of Royal Jelly

- Gamma Globulin- mostly immunoglobulins which powerfully strengthen the immune system
- 10-HydroxyDecanoic Acid- 20-60mcg/gm Powerful anti-bacterial and anti-fungal. It keeps RJ sterile.
- Gelatin- Precursor of collagen for skin, tendon, ligaments, etc
- Acetylcholine- up to 1mg/gram of RJ- the richest natural source. Important in nerve transmission and production and release of glandular secretions. “A tonic for the nervous system”. Provokes adrenaline secretion
- Nucleic acids- DNA and RNA the building blocks of genetic material available for repair projects.

52 Royal Jelly Proteins Identified

Other than the major royal jelly protein family and some other previously identified proteins, **42 novel proteins were identified** which are about 3% of the protein in RJ but most of their functions are still unknown.

Comprehensive Royal Jelly (RJ) Proteomics Using One- and Two-Dimensional Proteomics Platforms Reveals Novel RJ Proteins and Potential Phospho/Glycoproteins
J. Proteome Res, June 26, 2008

Pharmaceutical Forms

Fresh Frozen

Lyophilized

1 gram fresh frozen= 200-300mg lyophilized

Tablets, granules, coated pills

Lotions, creams, ointments, shampoos

Emulsions, salves

Suppositories and ovules

Mixtures with other natural products

Royal Jelly- Preservation

- Fresh royal jelly (RJ) was compared by chromatography when stored at -20 , 4 °C, and room temperature for 12 months.

Conclusion: The best way to maintain the quality of RJ is by freezing it.

- Proteomics Analysis of Major Royal Jelly Protein Changes under Different Storage Conditions, Journal of Proteome Research, July 3, 2008
- Combined with honey it can be stored in the refrigerator for three weeks

Royal Jelly Storage

Physiological Activity

- Measured by Growth Rates of Queen Larvae
- Under lab conditions after 6 days larvae fed
 - Fresh royal Jelly 191 to 240mg
 - RJ stored 3 days at 18-20° in light 17.1 to 55mg
 - RJ stored 5 days at 18-20° in light 8mg
 - Lyophilized RJ in distilled H2O 1:2 206 to 241mg

Alles, P. Alles, G. at the 23rd Apimondia Congress, Moscow, USSR
1971, p.5

- Lyophilized Royal Jelly will keep at room temperature indefinitely

ROYAL JELLY- Metabolic Activity

Royal jelly has a stimulating effect on the metabolic activity of proteins, glucose and lipids in part due to its high vitamin B5 content. Vitamin B5 (Pantothenic acid) catalyses the synthesis of co-enzyme A which help synthesize and oxidize fatty acids and helps other enzymes work.

White mice have significantly increased life spans when a sufficient amount of Vit B5 is added to their food.

ROYAL JELLY- Metabolic Activity

Royal jelly has a vasodillating action due to its rich acetylcholine content.

Royal jelly increases the oxygen consumption at tissue level.

The cardioprotective action is due to its capacity to stimulate an increased secretion of adrenaline via acetylcholine.

Stimulates liver to secrete glycogen raising blood sugar levels for more than 24 hrs.

Royal jelly is stimulant, tonic and euphorisant

ROYAL JELLY- Metabolic Activity

Endocrine and Hormone Balance

- Hypothalamic-pituitary functioning generally declines with aging.
- Reportedly RJ has favorable effects on the hypothalamic-pituitary axis.
- RJ can compensate for age- associated decline in pituitary functions in rats.
- Effects of Long term administration of Royal Jelly on Pituitary Weight and Gene Expression in Middle-Aged Female Rats, Yulio Narita, Shozo Ahta, et al., Biosci. Biotechnol. Biochem., 73, 80556-1-3, 2009

ROYAL JELLY- Metabolic Activity

Anti-oxidant and Anti-aging

Decreases intra-cellular oxidation by acting as a scavenger of reactive oxygen species. It also affects protein expression.

- Jamnik P, et al. Antioxidative action of royal jelly in the Yeast Cell, University of Ljubljana, Food and Science Technology Department, Slovenia
- Inoue, S. et al. Royal Jelly prolongs the life span of C3H/HeJ mice: correlation with reduced DNA damage, Exp. Gerontol, 2003 Sept;38 (9):965-9

ROYAL JELLY- Metabolic Activity

Anti-aging

Royal jelly peptides (RJPx) isolated from hydrolysates of water-soluble royal jelly proteins prepared with protease P exhibited significantly stronger hydroxyl radical-scavenging activity, and antioxidant activity against lipid peroxidation.

This data suggests that RJPx may inhibit LPO both in vitro and in vivo and help prevent cell damage.

- Royal Jelly Peptides Inhibit Lipid Peroxidation In Vitro and In Vivo, Journal of Nutritional Science and Vitaminology, Vol. 54 (2008) , No. 3 pp.191-195

ROYAL JELLY- Metabolic Activity

Antioxidant and Anti-aging Properties

Enzymatic hydrolysates were prepared from royal jelly using three enzymes- pepsin, trypsin, and papain.

The antioxidative activities and scavenging activities against active oxygen species such as superoxide anion radical and hydroxyl radical of each hydrolysate were high.

- Royal jelly will act as a medicinal food in the human body.

Antioxidant properties of enzymatic hydrolysates from royal jelly. Nagai T, Inoue R, Suzuki N, Nagashima T. Department of Food Science and Technology, Tokyo University of Agriculture, Hokkaido, Japan. J Med Food. 2006 Fall;9(3):363-7

Japanese Cosmetic Company Uses Royal Jelly

- **Cosmetics Makers Focus on Anti-Aging Products**
Nikkei Weekly (Japan), 12/19/05

A growing number of products are being promoted by cosmetics makers for their ability to restore and reinvigorate tired skin. . .

Last month, Kose Corp. started selling Ultimation Stretch Comfort, which comes in a package containing a beauty essence and a mask.

Users spread the essence, which contains a rich blend of such nutrients as royal jelly, on the face, then wear a jelly-type mask for about 15 minutes.

Royal Jelly cosmetic use

- Skin shows a marked reduction of wrinkles and better skin tone when royal jelly is applied topically.
- Skin with radiation damage heals rapidly
- Royal Jelly in Dermatologic Cosmetics, Hans Weitgasser, MD.,
Medizinische Kosmetick

ROYAL JELLY- Hormonal Activity

Estrogenic Effects

- It is said that fatty acids found in the royal jelly are effective towards autonomic imbalance, perimenopausal symptoms, osteoporosis, and other conditions. These effects may be due to the interaction of the fatty acids of royal jelly with an estrogen receptor inside the human body.
- A Theoretical Insight into the Interaction of Fatty Acids Involved in Royal Jelly with the Human Estrogen Receptor β Toshiaki Matsubara¹), Hiroyuki Sugimoto²) and Misako Aida¹, 1) Center for Quantum Life Sciences and Graduate School of Science, Hiroshima University 2) Yamada Apiculture Center, Inc.

ROYAL JELLY- Hormonal Activity

Estrogenic Effects

- At concentrations 10-100µg/ml RJ displayed a small but significant estrogenic activity via ER α , whereas it was a complete estrogen antagonist via ER β at a concentration range 50-200µg/ml .
- These findings suggest that RJ methanolic extract may be a **potent natural modulator of estrogen** signaling mediated via the estrogen receptor alpha and estrogen receptor beta subtypes.
- Abstract- Apimondia 2009, Royal jelly of Greek origin modulates the activity of the estrogen receptor subtypes ER α and ER β , A.Tsiapara, E.Melliou, I.Chinou, P.Moutsatsou, Department of Biological Chemistry, Medical School, University of Athens

ROYAL JELLY- Hormonal Activity

Estrogenic Effects

- This study demonstrated RJ competition with 17 beta-estradiol for binding to the human estrogen receptors alpha and beta and provides evidence that RJ has estrogenic activity through interaction with estrogen receptors followed by endogenous gene expressions.
- Royal jelly has estrogenic effects in vitro and in vivo. Mishima S, Suzuki KM, et al., J Ethnopharmacol. 2005 Oct 3;101(1-3):215-20

ROYAL JELLY- Hormonal Activity

Estrogenic Effects

- Henry Hale fed lab rats royal jelly and documented increased ovarian activity within a few days and a increase in fertility.

RJ Treatment of Menopausal Symptoms

- 3000 mg a day orally. It may take 1 to 2 weeks to notice a significant response in terms of lessening of symptoms like night sweats and hot flashes.

ROYAL JELLY- Metabolic Activity

Healing Collagen

With aging one loses the ability to renew collagen.

RJ contains the basic components of collagen and stimulates the production of TGF-beta 1 (transforming growth factor-beta 1) which is an important factor for collagen production.

Identification of a collagen production-promoting factor from an extract of royal jelly and its possible mechanism. Biosci Biotechnol Biochem, 2004 Apr;68(4):767-73

ROYAL JELLY- Metabolic Activity

Healing Collagen

- Identification of a collagen production-promoting factor from an extract of royal jelly and its possible mechanism.
Koya-Miyata S, etal. Biosci Biotechnol Biochem. 2004 Apr;68(4):767-73.
- Identified 10-hydroxy-2-decenoic acid derived from Royal Jelly as the factor which stimulates a fibroblast cell line to produce TGF-beta 1 which then stimulates collagen production

ROYAL JELLY- Metabolic Activity

Wound Healing

- **Royal Jelly Enhances Migration of Human Dermal Fibroblasts with Decreased Levels of Triglycerides And Cholesterol in In Vitro Wound Healing Model**
FASEB J, 2010 24:922.6
- RJ treatment significantly accelerated migration of fibroblasts in a dose dependent manner at 8hr.
- Among various lipid classes of fibroblasts, the levels of triglycerol and cholesterol were significantly decreased with 5 ug/ml RJ.

ROYAL JELLY- Metabolic Activity

Wound Healing

- Royal Jelly was applied topically to the tympanic membranes of guinea pigs after surgical perforation.
- After 3 months, the tympanic membranes of the guinea pigs showed marked fibroblastic orientation and well-organized connective tissue. Application of royal jelly also improved the success rate of closure compared to placebo.
- Effectiveness of Royal Jelly on Tympanic Membrane Perforations: An Experimental Study, Otolaryngol Head Neck Surg, 37(2):179-84

ROYAL JELLY- Immunologic Activity

Anti-cancer

Bisphenol A (BPA) is an environmental estrogen that stimulates proliferation of human breast cancer MCF-7 cells. Royal jelly inhibited the growth-promoting effect of BPA on MCF-7 cells

Effect of Royal Jelly on Bisphenol A-Induced Proliferation of Human Breast Cancer Cells. Nakaya M, Onda H, Sasaki K, Yuki Yoshi A, Tachibana H, Yamada K. Biosci Biotechnol Biochem. 2007 Jan 7

ROYAL JELLY- Immunologic Activity

Anti-Cancer

- Fraction RJP30, obtained by precipitation of RJ with ammonium sulfate, decreased by 2.5 fold the initial cell density of HeLa human cervicouterine carcinoma cells, after seven days of treatment.
- Screening of biological activities present in honeybee (*Apis mellifera*) royal jelly. Salazar-Olivo LA, Paz-Gonzalez V., Toxicol In Vitro. 2005 Aug;19(5):645-51.

Protects against Chemotherapy and Radiotherapy

- 100 mg/kg of body weight doses of both Royal Jelly and Green Tea provided protection against cDDP (cisplatin)-induced nephrotoxicity, and both products can act as protector agents against cDDP-induced kidney damage in adult albino mice

Protective effect of royal jelly and green tea extracts effect against cisplatin-induced nephrotoxicity in mice: a comparative study. Yapar K, Cavusoglu K, Oruc E, Yalcin E. J Med Food. 2009 Oct;12(5): 1136-42.

RJ Treatment of Cancer Treatment Side Effects

Offers Protection against chemotherapy &
radiation therapy

Mixture containing 25 grams pollen
+ 2 grams royal jelly
+ 223 grams honey.

Take 1 - 3 teaspoons /day

RJ Protective against cancer Treatment

- In children with leukemia RJ was effective in improving general condition of patients with increased appetite and weight gain.

ROYAL JELLY- Immunologic Activity

Antibacterial

- An antibacterial protein, royalisin, found in royal jelly has potent antibacterial activity at low concentrations against Gram-positive bacteria, but not against Gram-negative bacteria.
- A potent antibacterial protein in royal jelly. Purification and determination of the primary structure of royalisin. Fujiwara S, Imai J, Fujiwara M, et al., J Biol Chem. 1990 Jul 5;265(19):11333-7

ROYAL JELLY- Immunologic Activity

Anti-bacterial

- Four varieties of honey and one variety of fresh royal jelly (RJ) were used to evaluate their additive action against *Staphylococcus aureus*
- In a first step honey and RJ were used separately to determine their minimum inhibitory concentration (MIC) against the tested strain. In a second step, concentrations of honey and RJ than the MIC were combined.
- A strong linear correlation was noted between the MIC decrease of all varieties of honey and RJ.
- Additive Action of Royal Jelly and Honey Against *Staphylococcus aureus*. Boukraa L, Nair A, Benbarek H, Benhanifia M. J Med Food. 2008 Mar;11(1): 190-2.

ROYAL JELLY- Immunologic Activity

Anti-bacterial

- Four varieties of honey and one variety of fresh RJ were used to evaluate the additive antimicrobial action against *Pseudomonas aeruginosa*. The MIC of RJ dropped by 50 percent when used with a one-third MIC concentration of honey.

Additive Activity of Royal Jelly and Honey Against *Pseudomonas aeruginosa*, Altern Med Rev, 2008 Dec; 13(4):331-334

ROYAL JELLY- Immunologic Activity

Anti-bacterial

- Dr. Ahmed G. Hegazi reported that 2 guinea pigs covered with tuberculoid lesions were injected with royal jelly and recovered fully.

ROYAL JELLY- Immunologic Activity

Anti-bacterial

- Honey was found to have an inhibitory effect on *Helicobacter pylori* the bacterium which has found to be implicated in causing ulcers of the stomach.
- Inhibitory Effect of natural honey on *Helicobacter pylori*, A.T. Ali, M.N. Chowdhury, et al. *Tropical-Gastroenterology*. 1991 Jul-Sept: 12(3): 139-43

ROYAL JELLY- Immunologic Activity

Anti-viral

- In the 1940's Russian researchers injected chicken embryos with two different viruses. Some were also injected with royal jelly and others not. Those injected with RJ lived the others did not.

ROYAL JELLY- Immunologic Activity

Anti-viral

- In two groups of hospitalized patients, one was given royal jelly and propolis and the other nothing. In the treated group 6% got a viral illness. In the untreated group 40% became ill.
- Clinical Value of Royal Jelly and Propolis against Viral Illness, B.Filipic, M. Likvar, University of Sarjevo

ROYAL JELLY- Immunologic Activity

Antifungal

RJ contains Decanoic acid which is both anti-fungal and anti-bacterial

RJ Treatment of Bladder and Urinary Tract Infections

Mix: 10 g powdered cranberry
5 - 10 drops of raw unprocessed honey
1 queen cell (150 mg liophilized) royal jelly

Make pea sized tablets

Take 3 tablets/day under the tongue until dissolved

ROYAL JELLY- Indications

- Physical Exhaustion-

Antifatigue effect of fresh royal jelly in mice. *J of Nutr Sci Vitamin (Tokyo)*, 2001 Dec; 47(6):394-401

Royal Jelly- Neurogenic Effects

Brain Injury Healing

- The effects of AMP N1-oxide on the proliferation and/or differentiation of cultured neural stem/progenitor cells (NSCs) were examined...

These results suggest that AMP N1-oxide is one of the components that facilitates astrogenesis by NSCs through activation of STAT3...

Our present results suggest that AMP N1-oxide may be a good tool for protection against and therapy for certain brain injuries, because astrocytes play important roles in brain development and the response to injury...

- AMP N1-oxide Potentiates Astrogenesis by Cultured Neural Stem/Progenitor Cells Through STAT3 Activation
Biomedical Research, Vol. 28, pp.295-299 (2007)

RJ Treatment to Improve Memory

- Mix royal jelly and 40% vodka 1:2
- Take 5 - 10 drops 3 - 4 per day 1/2 hour before meals.
- Moderate amounts of alcohol were found to decrease incidence of dementia including Alzheimer's Disease in people over age 60
- Alcohol Consumption as a risk factor for dementia and cognitive decline: meta-analysis of prospective Studies, Anstey KJ, Mack HA, AM J Geriatr Psychiatry,2009;17:542-555

ROYAL JELLY- Metabolic Activity

Cholesterol Management

- The addition of royal jelly to the daily diet increases the HDL cholesterol, especially in older patients.
- Royal Jelly Increases High Density Lipoprotein Levels But in Older Patients Only, The Journal of Alternative and Complementary Medicine, April 2009, 15(4): 329-330

ROYAL JELLY- Metabolic Activity

Cholesterol Management

- Rats with experimentally induced hyperlipidemia were fed lyophilized royal jelly at about 100mcg/kg for 6 weeks.
- The investigators found decreased serum cholesterol and increased HDL with a $p \leq 0.01$

ROYAL JELLY- Metabolic Activity

Cholesterol Management

- In humans 50 to 100 milligrams dry weight of royal jelly per day decreased total serum cholesterol by 14% and lipids by 10%. The patients were given royal jelly by mouth and by injection but the results were very similar for both delivery techniques.
- Effect of Royal Jelly on Serum lipids in experimental animals and humans with atherosclerosis, Vittek, J. Experientia, Vol 51,(1995), Sept 29, pp 927-935

ROYAL JELLY- Metabolic Activity

Cholesterol Management

- Fifteen volunteers were divided RJ group N=7 took 6 g per day for 4 wk. Their serum total cholesterol (TC) and serum low-density lipoprotein (LDL) decreased significantly compared with those of the control group ($p < 0.05$).
- **Royal jelly supplementation improves lipoprotein metabolism in humans, Guo H, Saiga A, Sato M, et al. J Nutr Sci Vitaminol (Tokyo). 2007 Aug;53(4):345-8.**

ROYAL JELLY- Metabolic Activity

Aids bone formation

- RJ as a whole or some of its individual components stimulates production of type I collagen and other activities for bone formation through action on osteoblasts through up-regulation of procollagen I alpha1 gene expression.
- Royal Jelly Stimulates Bone Formation: Physiologic and Nutrigenomic Studies with Mice and Cell Lines. Narita Y, Nomura J, et al., Biosci Biotechnol Biochem. 2006 Oct 7; [Epub ahead of print]

ROYAL JELLY- Metabolic Activity

Glucose Metabolism

- To study the effect of royal jelly ingestion on the glucose metabolism of healthy humans. Twenty volunteers underwent the standardized oral glucose tolerance test (OGTT) and afterwards a second OGTT after ingestion of 20 g of royal jelly. Serum glucose levels after 2 hours and the area under the curve for glucose were significantly lower ($P = .041$) after royal jelly administration.
- Royal jelly reduces the serum glucose levels in healthy subjects. Munstedt K, Bargello M, Hauenschild A. J Med Food. 2009 Oct;12(5):1170-2.

ROYAL JELLY- Biologic Activity

Glucose and Insulin Response

- Investigation of the effects of RJ on insulin resistance, 10-week-old rats, a type 2 diabetic model, were treated for 4 weeks with RJ (10, 30, and 300 mg/kg, p.o.). RJ treatment tended to decrease systolic blood pressure and significantly decreased serum levels of insulin and the HMA ratio, an index of insulin resistance.
- **These results suggest that RJ could be an effective and functional food to prevent the development of insulin resistance.**

Effect of Long-term Treatment with Royal Jelly on Insulin Resistance in Otsuka Long-Evans Tokushima Fatty (OLETF) Rats. Nomura m, Maruo N, et al., Department of Clinical Pharmaceutical Science, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University. Yakugaku Zasshi, 2007 Nov;127(11):1877-82

RJ Treatment for Blood Vessels

After heart attack, stroke, and for
cardiovascular problems take 15 -20 mg
fresh royal jelly 2 - 4 times per day
30 - 60 min before meals for 5 - 6 weeks
Keep the royal jelly under the tongue until it
dissolves

RJ Treatment of High and Low Blood Pressure

Mix 5 g of fresh royal jelly with 100 g of raw
unprocessed honey

Mix well for 20 - 30 min

Keep tightly closed

Take 1 teaspoon 3 - 4 times per day under the
tongue until it dissolves

Take the mixture for 3 - 10 weeks depending on
your condition

RJ Treatment of Chronic Fatigue and Immune Dysfunction

Use rectal candles made by
compounding pharmacist in
dosage

2-50 gram of royal jelly depending
on the age and size of the person

Royal Jelly Protects against Wastewater Toxicity

- **Protective role of Royal Jelly (Honeybee) on Genotoxicity and Lipid Peroxidation, Induced by Petroleum Wastewater**

Environmental Technology, Volume 30, Issue 11 October 2009, pages 1205 - 1214

- Wastewater is contaminated with heavy metals. Seeds of *Allium cepa* L. were exposed to WW, RJ and WW+RJ. Royal Jelly exerted a dose dependent protective effect on the concentrations of heavy metals, decreased lipid peroxidation and caused recuperation of anatomic structural damages induced by the wastewater

Adverse Effects/ Cautions

Asthma/Allergic reaction

- Asthma, together with, in some cases, anaphylaxis, was observed in seven subjects following ingestion of royal jelly, a secretion of honey bees which is used as a health tonic.
- Conclusion: Symptoms of asthma and anaphylaxis seen in subjects following ingestion of royal jelly were true IgE-mediated hypersensitivity reactions.

Asthma and anaphylaxis induced by royal jelly. Thien FC, Leung R, Baldo BA, Weiner JA, Plomley R, Czarny D. Clin Exp Allergy. 1996 Feb;26(2):216-22.

ROYAL JELLY- Administration

- Daily maintenance dose 100-500 mg/ day
- Anti-viral 5000 mg/ day
 - Careful not to cause hormonal disorder
- According to Chinese texts to get optimal results it is necessary to pre-treat a patient for three weeks with royal jelly prior to beginning bee venom therapy

- **[Influence of royal jelly on the excretion of gonadotropins in healthy males] [Article in Slovak] Toman A, Kreze M. Bratisl Lek Listy. 1972 Mar;57(3):349-52**
- PMID: 5014059 [PubMed - indexed for MEDLINE]
- **[Effect of royal jelly on the exertion of corticoids] [Article in Slovak] Kreze A., Toman A. Vnitr Lek. 1969 Apr;15(4):341-6**
- PMID: 5780936 [PubMed - indexed for MEDLINE]
- **Biologically active substances in royal jelly.** Rembold H. Vitam Horm. 1965;23:359-82.
- PMID: 5326344 [PubMed - indexed for MEDLINE]
- **Effect of royal jelly on regeneration.** Hoja S, Vittek J., Folia Biol (Praha). 1963 Jun;9:230-2