

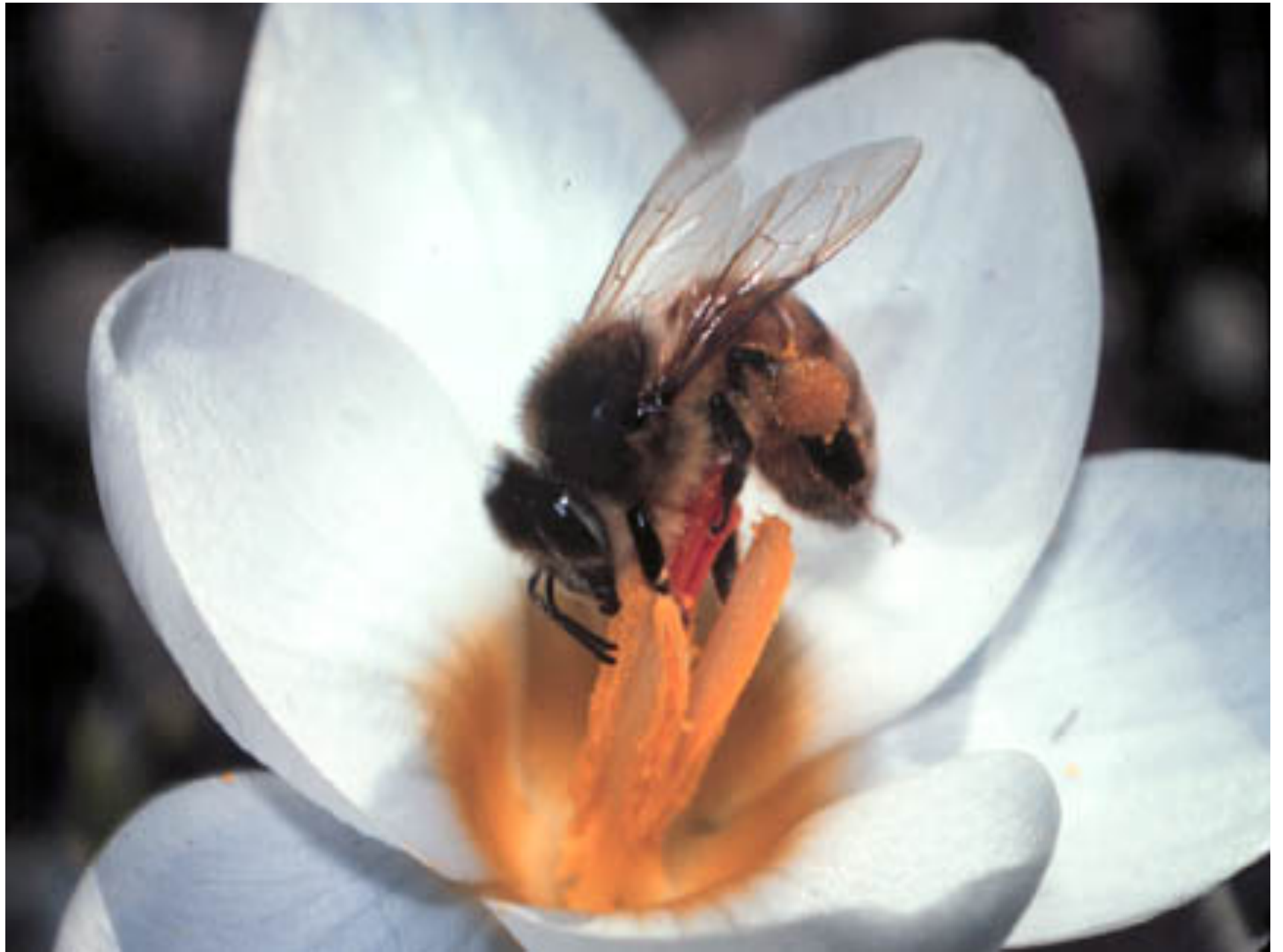
BEE POLLEN - Biochemical Composition and Mechanisms of Action



POLLEN

- Pollen grains are small, male reproduction units (gametophytes) formed in the anthers of the higher flowering plants. The pollen is transferred onto the stigma of a flower (a process called pollination) by either wind, water or various animals (mostly insects), among which bees (almost 30,000 different species) are the most important ones.





POLLEN

- It is important to know that pollen from each species is different and no one pollen type can contain all the characteristics ascribed to "pollen" in general. Therefore, pollen will always refer to a mixture of pollen from different species, unless otherwise mentioned.





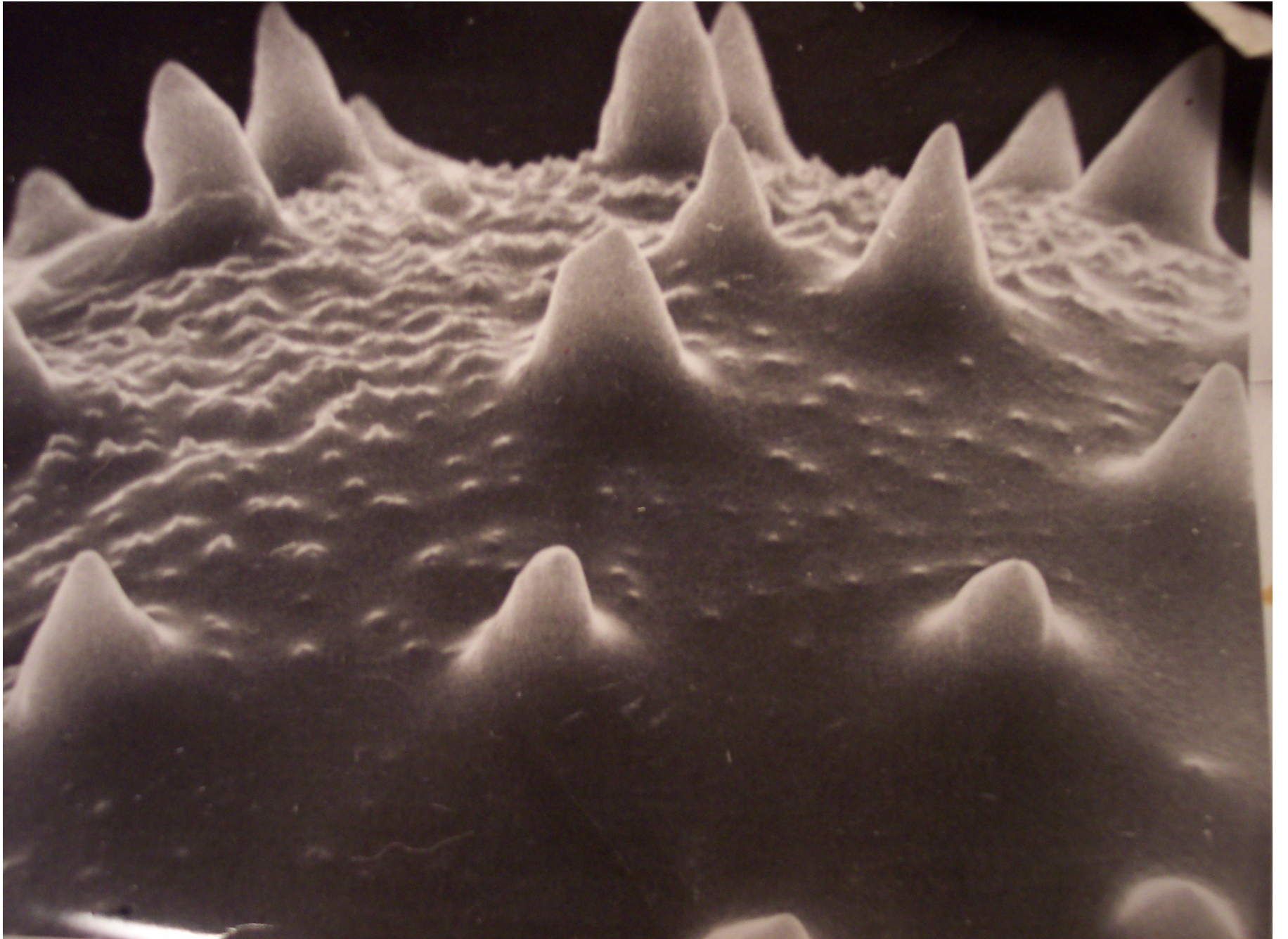


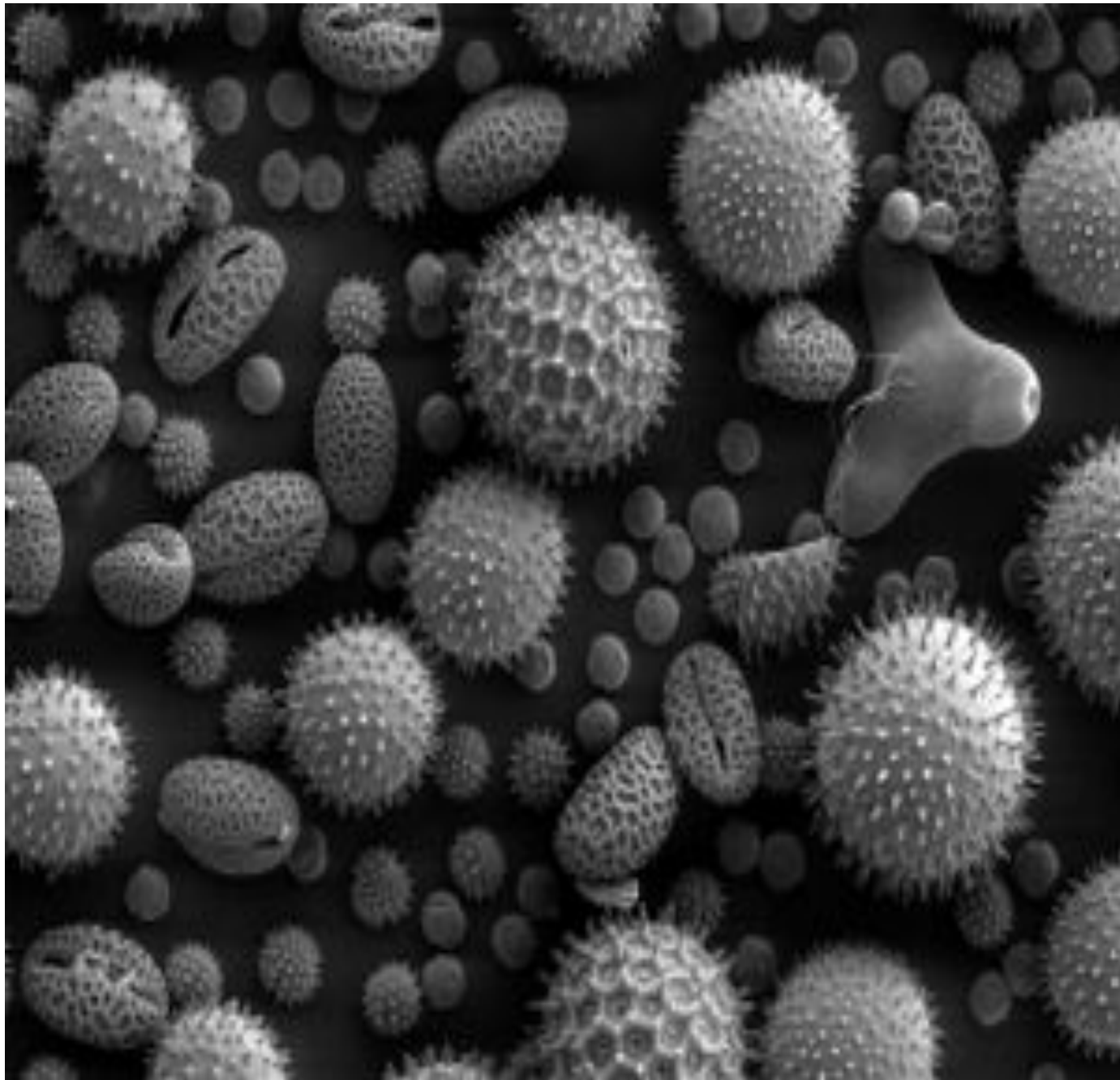


- A foraging honeybee rarely collects both pollen and nectar from more than one species of flowers during one trip. Thus the resulting pollen pellet on its hind leg contains only one or very few pollen species.
- The different colors are due to different flavonoids and carotenoids which besides being anti-oxidants are also pigments.



- Most pollen grains have a very hard outer shell (sporoderm) which is very difficult or impossible to digest. It is so durable that it can be found in fossil deposits millions of years old.
- There are, however, pores or holes in the shell which allow germination and also extraction of the interior substances.





- Clinical tests show that orally ingested pollen is rapidly & easily absorbed. Most of its components pass directly from stomach into blood stream.
- Bee pollen contains “all” the necessary nutrients for humans but not in the exact ratios we need.
- It supplies about 250 calories per 100 grams

POLLEN- Chemical Composition

Proteins and free amino acids

Protein contents of above 40% have been reported, but the typical range is 7.5 to 35%

Contains all 22 amino acids humans need to live. High amounts of proline and hydroxyproline building blocks for collagen. 30 grams (two tablespoons) of pollen a day satisfies the human need for amino-acids.

POLLEN- Chemical Composition

Sugars (mono-, di-, oligo- saccharides)

Sugar content ranges from 15 to 50% and starch content is very high (up to 18%) in some wind-pollinated grasses (Schmidt and Buchmann, 1992).

Pollen has mono-saccharides which can be directly absorbed by the gut without enzymatic intervention.

POLLEN- Chemical Composition

>200 enzymes

enzymes, coenzymes, and hormones (including growth hormones) that may be at least partially active in humans.

The antioxidant enzyme superoxide- dismutase (sod) is commonly found in pollen.

POLLEN- Chemical Composition

Lipids

Primarily free unsaturated fatty acids, lecithin/ phospholipids (the main compounds in the structure of biological membranes), and phytosterols/ cholesterol (the main precursor of bile acids and steroid hormones). Lipids in pollen are an important energy source. Some esters of the free fatty acids are considered growth factors- Auxins, brassins, gibberellines, and kinins.

Levels low in anemophile (wind pollinated) plants 2%

Levels high in entomophile (insect pollinated) 14%

POLLEN- Chemical Composition

Minerals

macro-elements and oligo-elements which regulate enzymatic processes

Elements: Mn, Fe, P, Zn, Cu, Mg, Ca, K, Na, Ni, Bo, Cr, Mo, I, F, Se.

POLLEN- Chemical Composition

Vitamins

hydro and lipid soluble act as enzyme cofactors

B1 Thiamin	9.2mcg/gram of Pollen
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B2 Riboflavin	18.5
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B3 Niacinimide	200
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B5 Pantothenic acid	30-50
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B6 Pyridoxine	5
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B9 Folic acid	3-7
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A	0.5-0.9 (very low)
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C	7-15mg
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POLLEN- Chemical Composition

- Hydrooxycinnamic acid (HCA) amides are involved with flowering but have anti-viral and antibiotic activities
- Flavonoids-antioxidants,anti-inflam, anti-cancer, piments (red,yellow,purple)
- Carotinoids- antioxidants, pigments(yellow and orange),
- Gonadotropins- stimulate the testes and ovaries
- Estrogenic cmpds.- compete with and substitute for estrogens at different times
- Rutin- anti-inflam, anti-oxidant, decreased platelet aggregation
- Phytosterols- decrease cholesterol, help the heart
- Lecithin- phospholipid, part of all cell walls, decrease cholesterol

Total Phenolic Content

a measure of antioxidant activity

• Red Grape	0.34
• Red Delicious Apple	0.42
• Mango	0.47
• Granny Smith Apple	0.64
• Black Plum	1.01
• Raspberry	2.09
• Blackberry	2.53
• Raisin	3.675
• Cranberries	5.575
• High Desert Bee Pollen Lot # 667-M	15.05

Pollen collection and Processing

- Fresh pollen contains 10% to 12% water
- Dried pollen has 4% water
- It is estimated that in drying it in the sun it loses about 50% of its potency due to oxidation of its antioxidants.
- Best is to dry it 20 hrs at 30°C/86°F in dark
- One alternative is to freeze it immediately upon collection, another is to dry it by contact with a silica gel.

- All body systems benefit from bee pollen with special emphasis on:
 - -reproductive
 - -immune
 - -nervous
 - -lipid metabolism

History of Use

- As far back as 2735 B.C. Shen Nung, a Chinese emperor had medical texts discussing the merits of pollen.
- Egyptian papyri refers to Pollen as life giving dust.
- Hippocrates recommended pollen as a remedy for several conditions
- The Hindus taught that eating honey and pollen could produce health, vigor, happiness and wisdom.

Tolerance

- No contra-indications even in pregnancy
- No incompatibilities with other therapeutics
- No tolerance even in long lasting administrations
- No toxicity even in high dosage

Possible negative effects

- Unpleasant feeling of taste & flavor
nausea
- Light intestinal disorder (light diarrhea)
during first day if high dosage
- Gastric pains (when pellets are not
dissolved)
- Allergic reaction including hives, itching
and anaphylaxis

POLLEN- General Uses

- Increase energy & endurance
- Help with weight loss or gain depending on need
- Multivitamin (especially in pregnancy)
- Allergies and Asthma
- Anemia
- Improves overall immunity
- Aids in health conditions such as: Crohn's disease, seizures, cancer, radiation treatments, hepatitis, prostate diseases, ulcers and more
- Antibiotic

Pollen- Cognitive Performance

- A Summary of Clinical Tests Concluded With Bee Pollen and Other Substances, Naturheilpraxis, 1977
- “Bee-pollen preparations increase mental work performance... In five of eight children who were mentally lazy and doing poorly in school, mental performance and grade point average improved significantly after they took bee pollen for twelve weeks”.
- “ In ten adult patients, a faulty memory and lack of concentration were improved after their diets were supplemented with bee pollen for three months”.

Pollen- Allergy Protocol

- Based on a concept of oral desensitization where a small amount of allergen or parts of an allergen are absorbed directly into the blood stream and the body develops a tolerance.
- It is best to use “local” pollen but some results are obtained even with not local pollen.
- Local raw unfiltered honey has traditionally been used for this purpose but it appears to be more efficient to use straight pollen.

Pollen- Allergy Protocol

- 1st day 1 granule of pollen
- 2nd day 2 granules of pollen
- 3rd day 4 granules of pollen
- 4th day 8 granules of pollen
- 5th day 16 granules of pollen
- 6th day 1/8 of a teaspoon
- 7th day 1/4 of a teaspoon
- 8th day 1/2 of a teaspoon
- 9th day 1 teaspoon
- Continue daily 1/2 to 1 teaspoon

Pollen- Immune Response

- Pollen does not directly attack a tumor. It stimulates the immune system.
- It also can protect the body from cytotoxic damage of chemotherapy
- Antiestrogenic and Antigenotoxic Activity of Bee Pollen from *Cystus incanus* and *Salix alba* as Evaluated by the Yeast Estrogen Screen and the Micronucleus Assay in Human Lymphocytes Eur Journal Med Chem, June 9,2010

Pollen- Cancer Treatment

- Mice bred to develop and die from tumors were fed bee pollen at ratio of 1:10,000 to mice chow. In untreated mice tumors developed in 100% at an average of 31.3 wks. In the pollen fed mice the average onset was 41.1 wks and some of the mice were still tumor free at about 60 wks. when the test terminated.
- Delay in the Appearance of Palpable Mammary Tumors in C3H Mice Following the Ingestion of Pollenized Food, William Robinson, Journal of the National Cancer Institute, 1948

Pollen- Protection from Radiation

- In 1978, 84 female patients getting radiation for gyn cancer were having side effects such as lack of energy, nausea, emesis, diarrhea, anorexia, headache, etc.
- After taking the pollen preparation (with RJ + honey)
 - Fatigue: none 30.5%, “light” 66.7%, still severe 2.8%
 - Anorexia: none 38.9%, “light” 41.6%, moderate 8.3%
 - Nausea: none 44.4%, minimal 50%

Therapeutic Effects of Melbrosin in Irradiation Diseases, Osmanagic, I, Mavric, N., from Univ. of Vienna, 1978

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

POLLEN- Prostate diseases

The Overlapping lower urinary tract symptoms of benign prostatic hyperplasia and Prostatitis,

The author recommends phytotherapies including saw palmetto and bee pollen.

Nickel, J. Curtis, in Current Opinion in Urology, 16(1):5-10, Jan 2006

- The phytochemicals lycopene, beta-sitosterol, other phytosterols and numerous flavonoids contained in bee pollen have been shown to inhibit the growth of prostate tissue and to reduce pain, inflammation and the risk of prostate cancer.

Treatment of Outflow Tract Obstruction Due to Benign Prostatic Hyperplasia with the Pollen Extract, Cernilton

- In a DBPCT 60 patients with outflow obstruction due to BPH took pollen extract or placebo for six months. At the end of the six months,
- Nocturia- Pollen 60% better or none
Placebo 30% better
- Bladder emptying Pollen 57% better
Placebo 10% better
- Buck, A.C., R. Cox, R.W.M. Rees, L. Ebeling, and A. John, *British Journal of Urology*. 1990. 66.

Prostate References

Citations

- 1. Clouatre, Dallas, Ph.D., *Pollen Extract for Prostate Health*, 1997, San Francisco, CA: Pax Publishing.
- 2. Kimura, Masayasu, I. Kimura, K. Nakase, T. Sonobe, and N. Mori, "Micturition Activity of Pollen Extract: Contractile Effects of Bladder and Inhibitory Effects on Urethral Smooth Muscle." April, 1986. *Planta Medica*
- 3. Buck, A.C., R.W.M. Rees, and L. Ebeling. "Treatment of Chronic Prostatitis and Prostatodynia with Pollen Extract." *British Journal of Urology*, 1990.64
- 4. Rugendorff, E.W., W. Weidner, L. Ebling, and A.C. Buck. "Results of Treatment with Pollen Extract (Cernilton) in Chronic Prostatitis and Prostatodynia." *British Journal of Urology*. 1993.71

Pollen- Male Sexual Dysfunction

- A joint Swedish-German study of 176 patients with a variety of dysfunctions- reduced libido, painful orgasm, premature ejaculation, impotency and combinations.
- A pollen preparation, not well explained, was given with improvement in 44% which given the wide variety of dysfunctions treated was considered quite surprisingly high.

Pollen- Reproductive and Sexual Function

- Estrogenic and gonadotropic hormonal stimulating materials have been isolated from pollens. These stimulate both male and female sex organs.
- The Gonad Stimulating Potency of Date Palm Pollen Grains, Soliman, FA. Soliman, A., Experientia, Oct. 1957
- This may explain the reports of improved sexual function in men and increased fertility in women.
- Pollen has been used to increase egg production in chickens.

Pollen- Reproductive and Sexual Function

- In a study of 120 girls between 15 and 20 years of age with symptoms of pre-menstrual syndrome more than 90% had resolution of all symptoms within two months. In the control group less than 5% improved.
- The Treatment with Melbrosin of Dysmenorrhea in Adolescence, Pokrajcic,L. Osmanagic, I.
- A similar result was achieved by Dr. Osmanagic in women with menopausal symptoms, especially in those with surgically induced menopause.

Pollen- Reproductive and Sexual Function

- Formula for Pre-menstrual and menopausal symptoms
- 25 grams pollen + 2 grams RJ + 250 ml Honey
- Dosage: 1 teaspoon in the AM for pre-menstrual
1 tsp twice a day for menopause

Pollen- Gastrointestinal system

- A 1971 study done in Moscow found that 250 milligrams of bee pollen administered twice per day remarkably improved the symptoms of bleeding gastric ulcer patients.

Pollen- Hematologic

- Chinese studies on humans and animals have demonstrated that consuming bee pollen for several days prior to moving to high altitude reduces the incidence of altitude sickness, and apparently improves the ability to adapt to lower levels of oxygen in the air.
- Formula for anemia: 1 tsp pollen three times a day for a month then recheck CBC

Pollen- Lipid Metabolism

- Clinical Tests Concluded With Bee Pollen and Other Substances, Naturheilpraxis, 1977
- Summary: Bee pollen in the diet acted to normalize cholesterol and triglyceride levels in forty patients. HDL cholesterol increased, LDL decreased

Pollen- Ophthalmology

- Improvement of coreoretinal circulation (posterior pole)
- Herpetic keratitis
- Corneo conjunctival burns
- Trophic cornean ulcers
- Ophthalmic surgery
- Improvement of visual capacity

Pollen- for Weight Loss

- Can help in both weight gain and weight loss
- It provides about 250 cal/100 mg (6+tablesp)
- It has phenylalanine which suppresses appetite by acting on the appestat.
- Regimen: Two 20 to 40 gram meals a day
One regular meal
Between meals- more pollen

Pollen- for Weight Gain

- 10 to 30 grams of Pollen plus
- 20-50 grams of Honey
- With each meal and for snacks

Bee Bread/Pollen

- The bees make bee bread to feed larva in the cells. They fill the bottom 1/3 with pollen then 2/3rds honey and cap with propolis.
- Donald Downs' formula is
3 lbs. honey + 2.5 lbs. pollen in a one gallon jar. Swirl to mix, then turn it over 2 or 3 times a day for two weeks.

It is easier to digest than pollen and usually tastes better, especially if grass is not your favorite flavor.

Pollen- medicinal properties

Varies according to its composition which Varies

Thyme- stimulating, antiseptic, slight aphrodisiac

Sage- diuretic, regulates GI function, menstrual effects

Sunflower- diuretic and laxative

Canola- varicose veins

Apple- myocardial effect and general fortifying

False Acacia- sedative

Chestnut tree- supports venous and arterial circulation,
liver and prostate decongestant

BEE POLLEN DOSING

- Routine 1-2 tablespoons a day
- Acute dosing 1-2 tablespoons TiD
- Tips for storing, buying and eating pollen
 - Store in a cold dark place. Sunlight exposure is bad for pollen
 - Assess freshness: appearance, texture, smell, taste
 - Start slow and slowly increase the amount. Mix with honey. Do not heat it.

Other Protocols

- Pre and Post op- mixture of pollen, RJ + honey 3 tsp/day for 4 days before and once a day after until full recovery
- Hepatitis- 10grams pollen 3 times a day after meals
- General prostate- 6-8 (400mg) capsules/day for 1 year
- Atherosclerosis- pollen + vegetable Lecithin 2 tsp/day after meals 15 days/ mo.

END