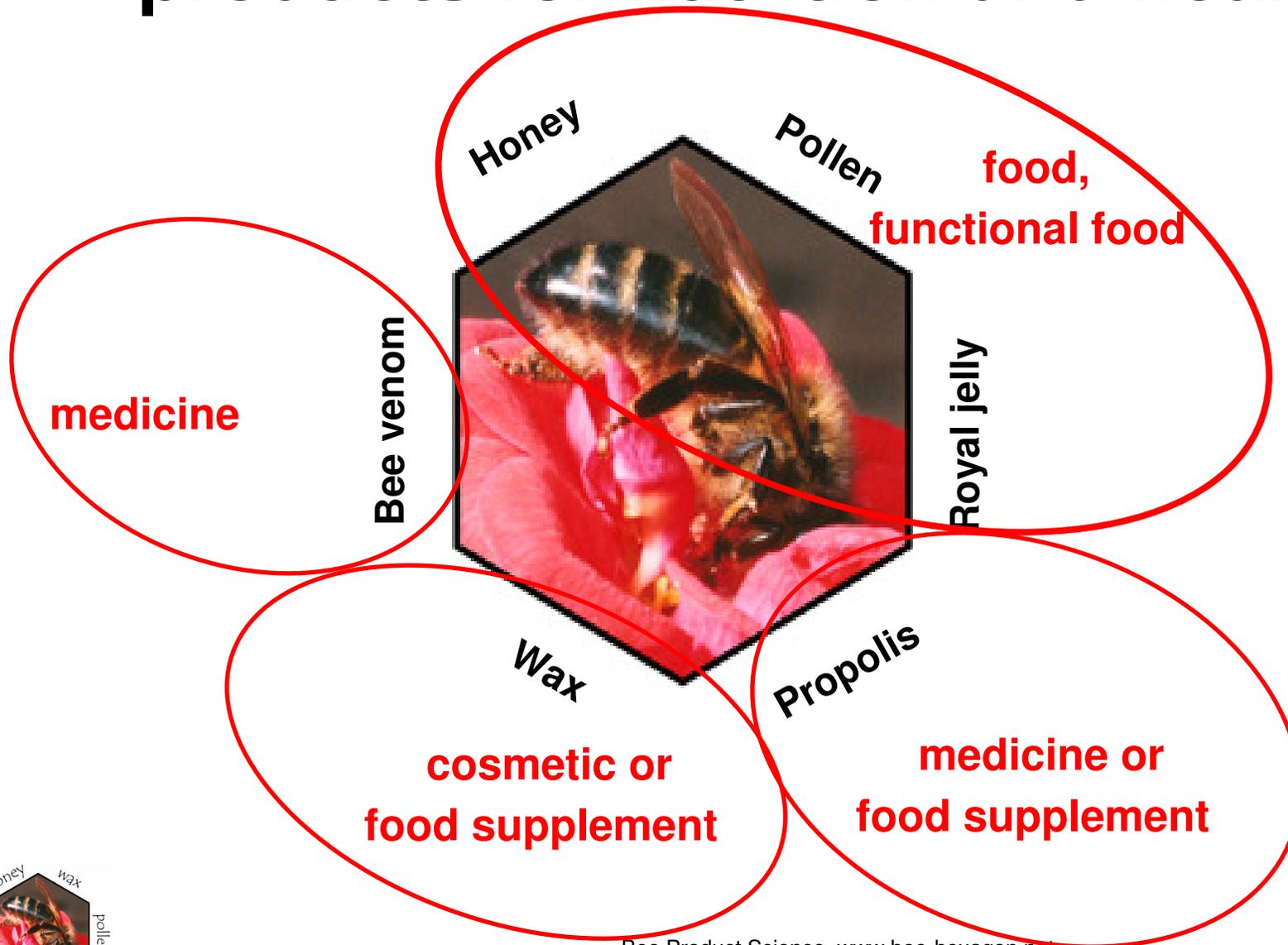


Functional and Biological Properties of Bee Products

Stefan Bogdanov,
Bee Product Science, Switzerland

What is the function of the bee products for nutrition and health?

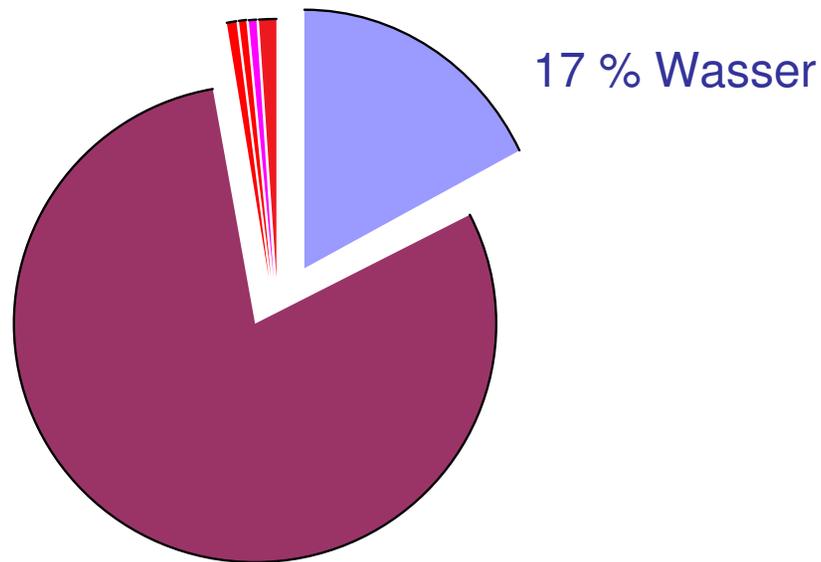




Nutrition

Coverage of the Recommended Daily Intake Intake of 20 g honey per day

Ca. 3 % proteins and amino acids
minerals, acids, aroma compounds
polyphenols



80 % carbohydrates

Minerals

Selenium: 10 – 40 %

Chromium: 2-4 %

Copper: 1-16 %

Carbohydrates:

ca. 3 %

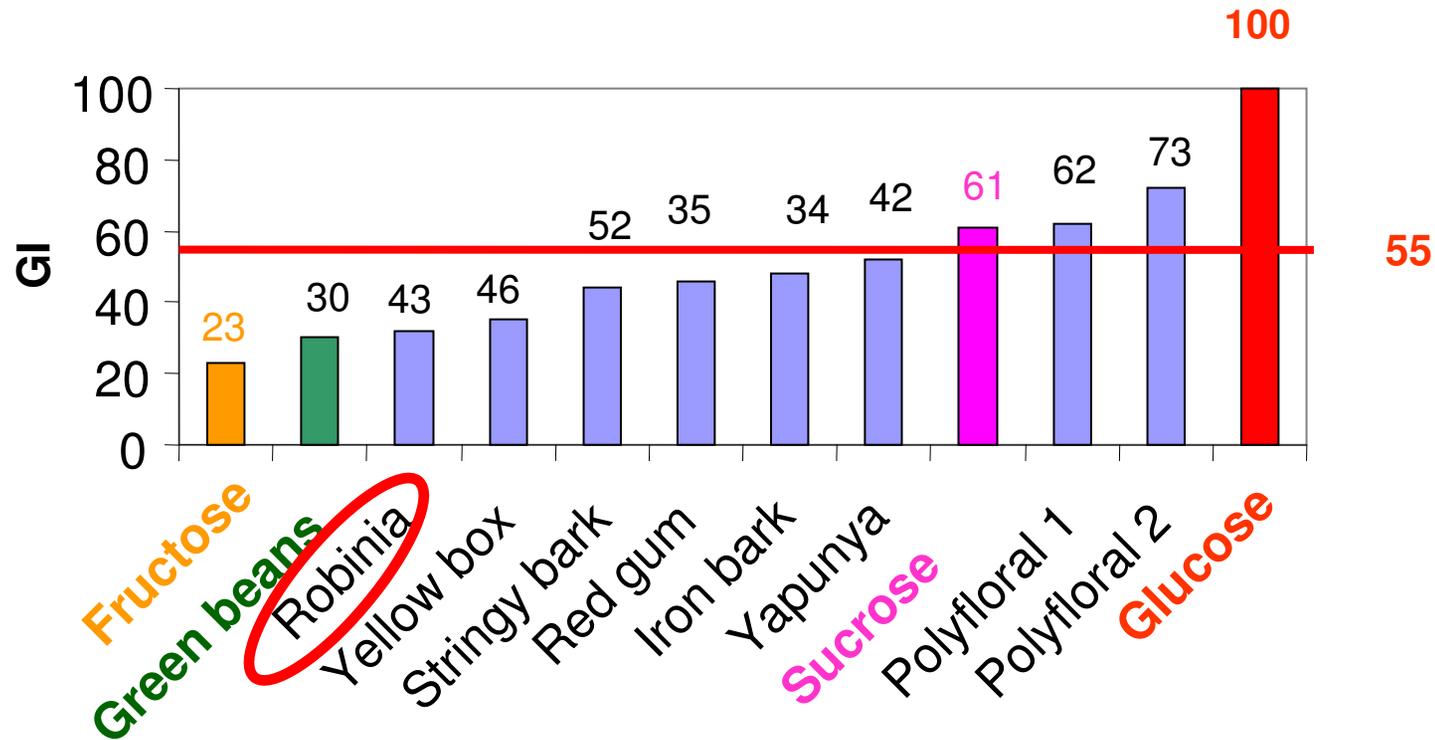
Rest: < 1 %

**Wide variation of RDI coverage,
depending on the botanical origin of
honey**





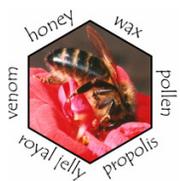
Glycemic Index

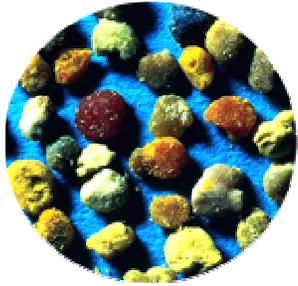


After Foster-Powell 2002; Arcot and Brand-Miller 2005

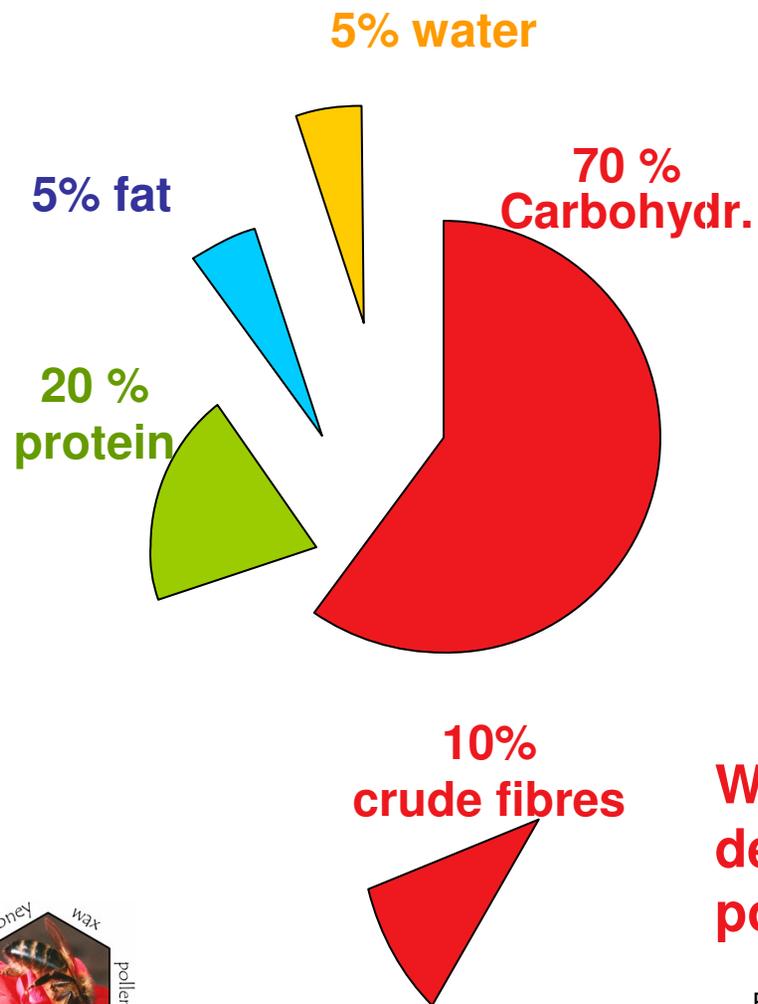


Pollen





Nutrition and % RDI, intake 15 g



Main nutrients

crude fibres ca. 0.1 - 10

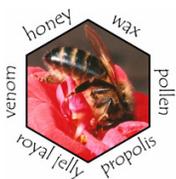
Minerals

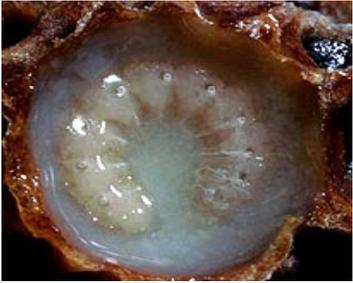
K: 5-27, Mg: 2-23, Zn:10-79, Mn:15-85, Fe: 2-37,
Cu: 4-36

Vitamins:

Pro-Vit A: 30-600, E: 8-66, B1:15-32, B2:12-43,
B3: 7-20, B6: 4-13, Folic acid: 20-67, H: 30-42

**Wide variation of RDI coverage,
depending on the botanical origin of
pollen**



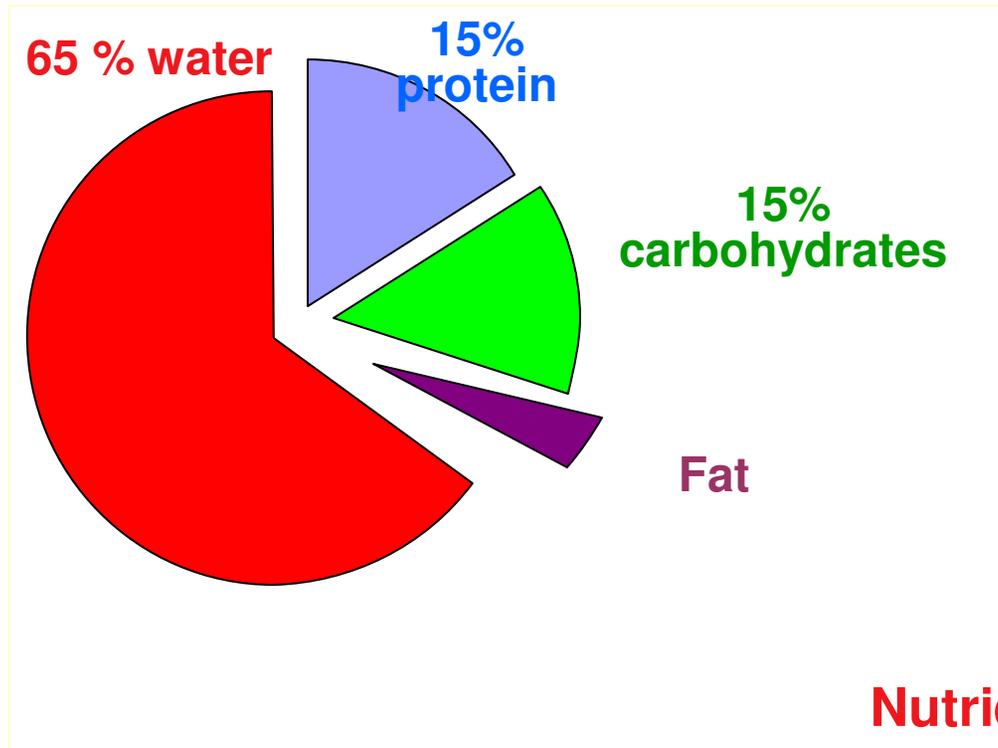


Royal Jelly





Nutrition and % RDI, Intake 1 g /day

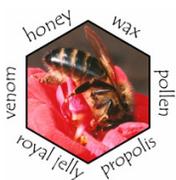


Main nutrients:
all below 0.5 %

Minerals:
all below 0.5 %

Vitamins:
B3: 3-15, H: 2-18 %

Nutrient contribution very small

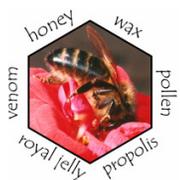




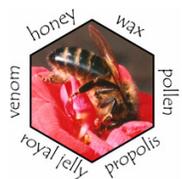
Beeswax as a natural food additive E 901

allowed as additive for

- Sugar and chocolate products
- Nuts
- Coffee grains
- Cover of apples, pears, peaches, ananas, melons, and oranges
- Basis of chewing-gums
- Support for food colorants



Biological and Functional Effects in cell cultures and animal experiments



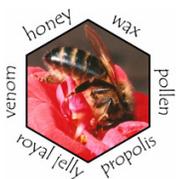
Product	Biological Effect	Functional effects
Honey, pollen, royal Jelly	antibacterial, fungicide, antiviral	Growth inhibition of von pathogen bacteria, fungi und viruses
Honey, pollen, royal jelly	antioxidativ, immono-modulating and immuno-activating, anti-inflammatory	anti-cancer, stimulate immune diffence against inflammation
Pollen, Royal jelly	radio-protective, anti-arteriosklerotic, enhances Ca absorption	Protects against radiation atherosclerosis and osteoporosis
Honey	<u>prebiotic</u> (oligosaccharides) <u>probiotic</u> (contains probiotic bacteria)	Stimulates healthy digestion by promoting the growth of good intestine bacteria (Bifidus, etc)
Royal jelly	increases reproduction and oxigen uptake of cells and has an effect on central and peripheral nervous system	Stimulating and energising, against stress and fatigue, protection of the central nerve system
Royal jelly	antihypertensiv, vasodilatativ	Cardio-protective

Nutritional and Functional Properties: Conclusions

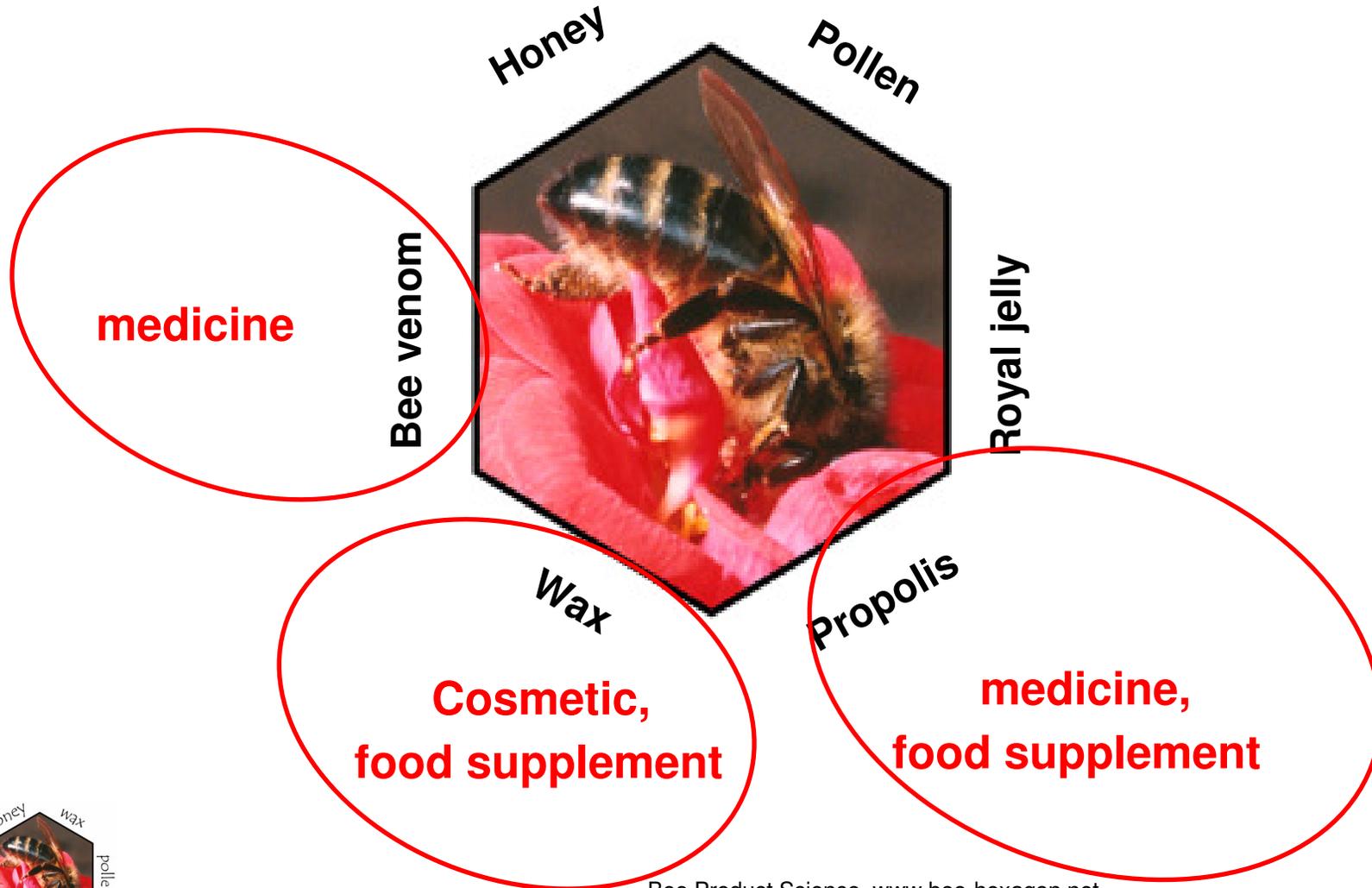


**Honey and pollen can be regarded as functional food,
Royal jelly is rather a dietary supplement with functional properties**

Next step: Registration of specific health claims for labelling of bee product nutrients.



Propolis, Wax, Bee Venom



Propolis



Popplar

Baccharis

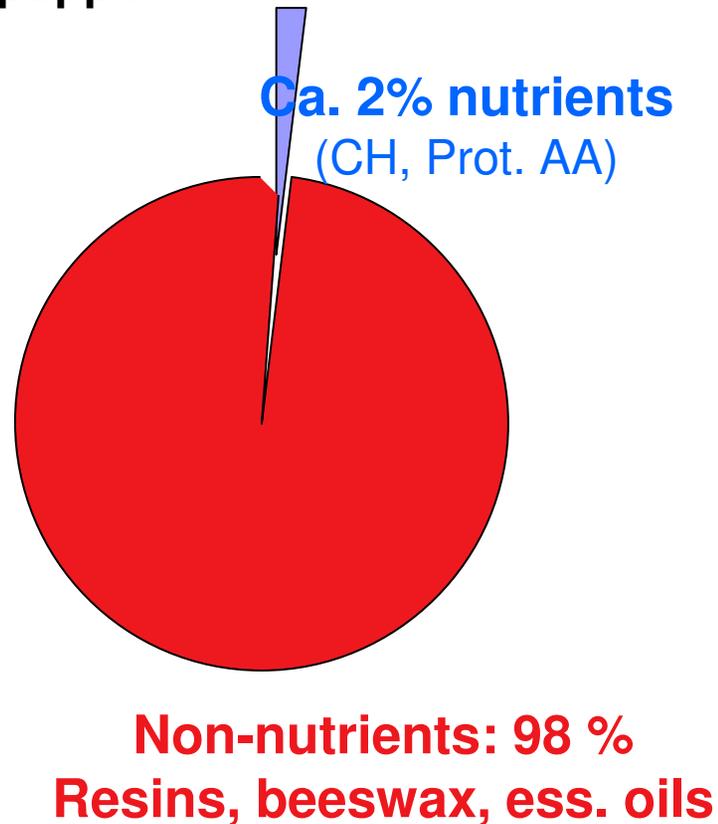




poplar



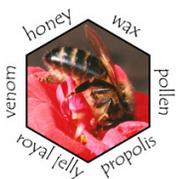
Propolis



**Pure food components neglectable
in all propolis types**

**Specific composition depends on the
botanical source**

**Propolis is not a food.
Dietary supplement?
Medicine?**



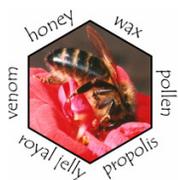


Biological and Therapeutical Effects in cell cultures and animal experiments

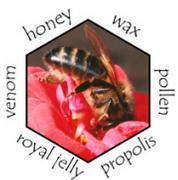


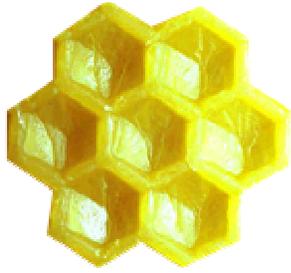
- ✓ antibacterial, synergistic effect on antibiotic potency
- ✓ fungicide, antiviral, antiparasitic
- ✓ anti-inflammatory
- ✓ Anti-oxidative, radio-protective
- ✓ immuno-modulating, anti-cancer
- ✓ local anaesthetic, anti-spasmolytic
- ✓ liver-protective and liver-detoxacating
- ✓ improves blood circulation, anti-coagulant
- ✓ tissue-regenerating

**Most of the above effects are similar in
both popplar and green propolis**

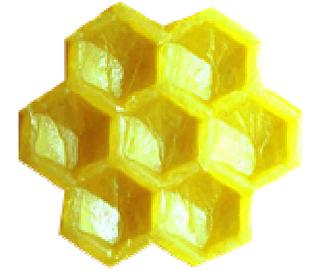


Beeswax

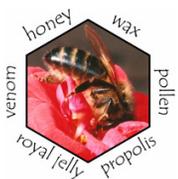




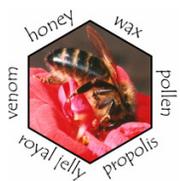
Properties and Uses



- ✓ builds stable emulsions, improves water binding of creams
- ✓ improves soap function, gives a protective film on skin and improves its elasticity
- ✓ ingredient of creams and lotions for skin and lip care
- ✓ **improves protective action of sun creams, does not provoke allergy**
- ✓ **antibiotic effect, warming properties**



Bee Venom

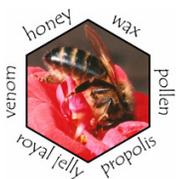


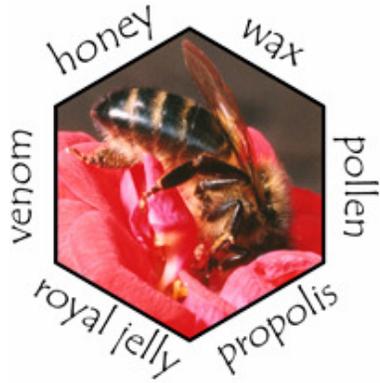


Positive und **negative** biological effects in cell cultures and animal experiments

- ✓ anti-inflammatory, anti-rheumatic, pain-soothing
 - ✓ anti-cancer
 - ✓ radio-protective
 - ✓ immuno-activating (high Doses)
immuno-modulating (small doses)
 - ✓ hemaglobin promoting, anti-coagulant, increases heart puls, blood circulation and blood pressure, lowers cholesterin content
-
- ✓ **causes inflammation and pain**
 - ✓ **toxic for cells, can block respiration**
 - ✓ **allergenic**

Negative effects are minimal when applying BV at therapeutic doses !



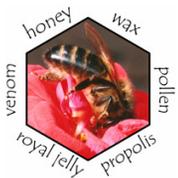


Allergy

- ✓ with the exception of BV incidence is similar to other food products or natural medicine
- ✓ Cases of allergy reactions after royal jelly
- ✓ Propolis provokes contact allergy
- ✓ Bee venom is allergenic

Contamination

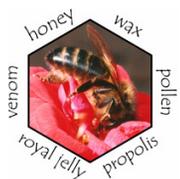
main source is beekeeping: Good Apicultural Practice





Health Enhancing Effects in cell cultures and animal experiments

- ✓ **All bee products have promising health enhancing effects**
- ✓ **Food with functional properties: honey, pollen**
- ✓ **Dietary supplement: royal jelly and propolis**
Food supplement: beeswax, propolis
- ✓ **Specific health claims for the above are possible**
- ✓ **Medicine :Bee venom, propolis:**
- ✓ **There is wide biological variation of the composition and properties of honey, pollen and propolis. Standardisation is necessary for registration as medical drugs**



At least 6 times thanks to the bees and their wonder hexagon!

