بسم الله الرحمن الرحيم

IN THE NAME OF GOD

ee products as immunopotentiation

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Bee products as immunopotentiation

Bee products as immunopotentiation

THE IMMUNE SYSTEM

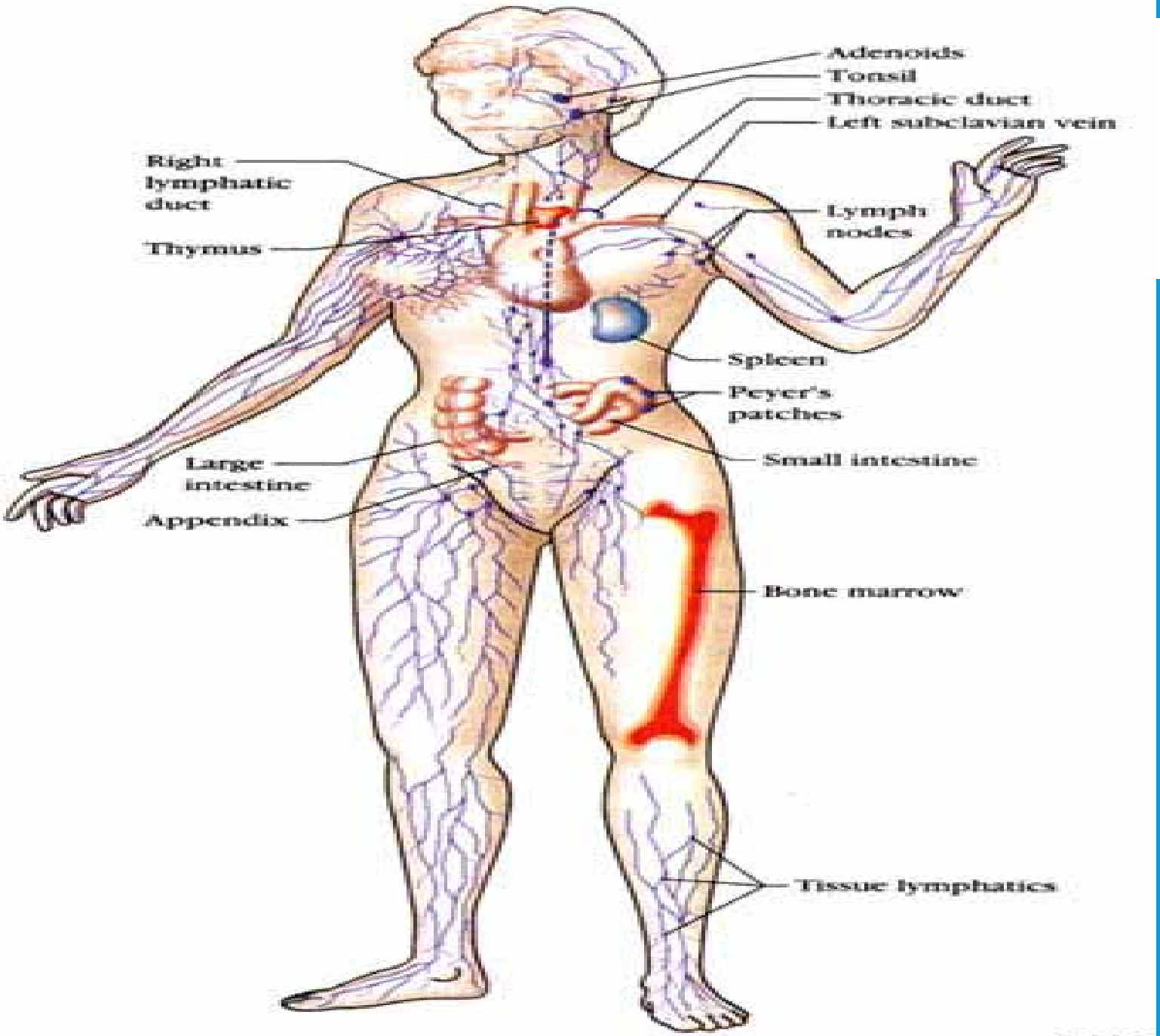
Through a series of steps called the immune response, the immune system attacks organisms and substances that invad body systems and cause disease.

Surface barriers

- skin, lungs, stomach, tears, saliva, flora

Components of the Immune System:

- White Blood Cells circulate via blood and lymph.
- Lymph tissue
- Organs: thymus, spleen, bone marrow


Adenoids
Tonsil
Thoracic duct
Left subclavian vein
Right lymphatic duct
Thymus
Lymph nodes
Spleen
Peyer's patches
Small intestine
Large intestine
Appendix
Bone marrow
Tissue lymphatics

Bee products as immunopotentiation

INTRODUCTION

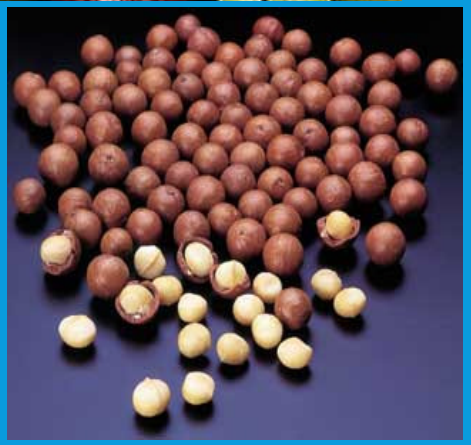
- Apitherapy open a good area of researches to overcome many irritable disease problems which many patients are suffering from it, beside the horrible side effects of chemical drugs.

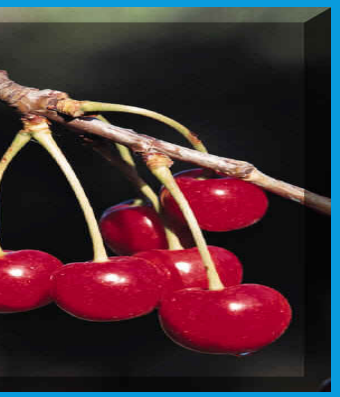
Obviously, honey bees are important for honey production…

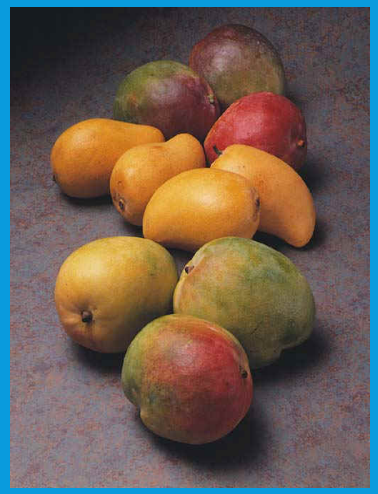
CROP POLLINATION

…but they are even more important for crop pollination. Beehives are often contracted to be placed temporarily into fields and orchards to help pollinate crops. Over 100 different crops reply on honey bee pollination, accounting for $20 billion per year in added agricultural produce. African bees are much less amenable to transport and movement in agricultural contexts, which could ultimately increase the price of produce.

Fruits and Nuts







Vegetables and Melons

Field Crops

APITHERAPY

is the Complementary and Alternative Medicine promoting the use of bee products

- Honey
- Bee bread
- Pollen
- Royal jelly
- Propolis
- Apitoxin or bee venom
- Hive air
- Comb beeswax
- Drone larvae
- Whole bees enteras

WHAT IS APITHERAPY

- **“Apitherapy” is, simply said, the use of bee products to prevent, heal or recover somebody from one or more diseases/conditions.**

- **The origin of this word is Api" comes from the bee's latin name: *Apis mellifica***
- **"therapy" comes from the Greek word "*therapeuein*" which means a method to treat the human beings or animals against different diseases.**

APITHERAPY

Medical importance of bee products

- For nutrition ,
- Health
- Life quality
- Improvement
- Prevention and treatment of diseases,
- Cosmetics .

APITHERAPY

- All bee products have medicinal properties.
- Their cost is pennies.
- Easy obtened, storage, processing, and application.
- Many diseases can be healed and prevented.
- Apitherapy is available for poorest countries
- Available for everyone
- Synergic with antibiotics and other medications.

APITHERAPY

- Immunostimulant.
- Anticancer.
- Wound healers.
- Antiviral, antifungal, wide-spectrum antibacterial.
- No undesirable secondary effects.
- No doctor’s prescription is needed.
- They are the best medication world over

APITHERAPY AND BEEHIVES ARE AN IMMEDIATE ANSWER TO THE NEED FOR

- vitamins,
- proteins,
- antibiotics,
- oral rehydratants,
- anaesthetics,
- antiseptics,
- topical healers for wounds and burn
- tissue preservatives,
- immunostimulants,
- and other healing resources.

WHAT IS APITHERAPY

Apitherapy is not just a simple, therapeutically meth

it is already a different type of medicine.

We can even call it "**APIMEDICINE**".

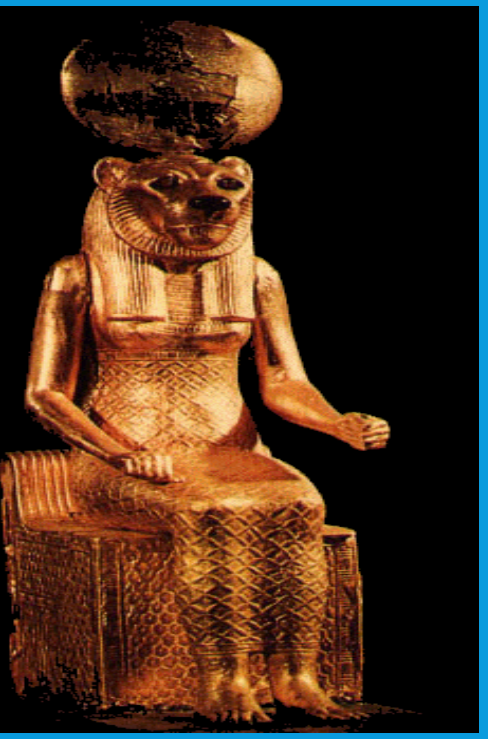
History

- From historical point of view the honey bees evolved roughly more than 100 - 160 million years.

- Imhotep, a physician who became a deified god

Tomb complex of Zoser-
Egyptian god of healing

ANCIENT EGYPTIAN MEDICINE



Sekhmet Netjert (Goddess) of Healing

- The Egyptians explained medicine as the work of the gods, caused by the presence o evil spirits or their poisons, and cleansing th body was the way to rid the body of their influence.
- Incantations, prayers to the gods - above a to Sekhmet

Bee products as immunopotentiation

History

The Holy Bible, in the old and New Testame
points to the bees and their products for more th
40 times as urged eating honey, as gifts
inhabitants of countries faraway, as a good fo
either alone or with other food materials in t
human diet.

Bee products as immunopotentiation

History

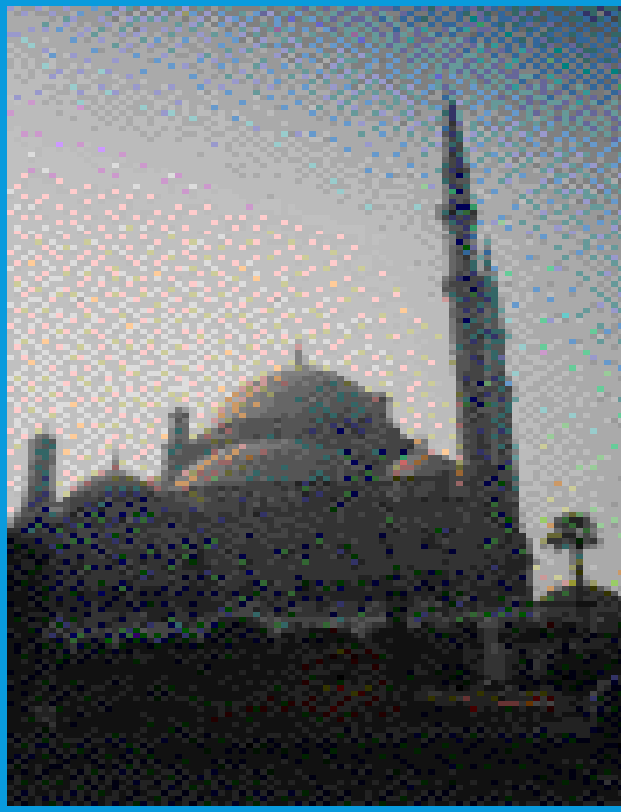
Where the Holy Koran has a long Surah (chapter) with the name of bees (No. 16, Surah Al Nahl). The God Says “ God inspired bees to live in mountains, trees and that they construct. Ten eat from fruits and follow the ways of the God. Hence comes out of their bellies, syrup of different hues, in which there are cure for people. In this there is a proof of those who think deeply”.

ل الله تعالى" بسم الله الرحمن الرحيم
وحى ربك إلى النحل أن أتخذى من
جبال بيوتا ومن الشجر ومما يعرشون
كلى من كل الثمرات فأسلكى سبل
ك ذللا يخرج من بطونها شراب مختلف
انه فيه شفاء للناس إن فى ذلك لآية
وم يتفكرون " (النحل : 68 و 69)

Bee products as immunopotentiation

History

- In the Holy Hadeth The prophet Mohammed mentioned 23 Hadeth. He described the Moamens like bees and he prefer honey as a food.



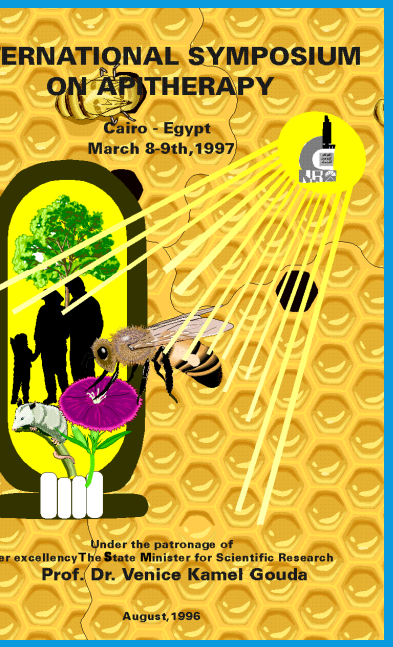
Bee products as immunopotentiation

History

- He was took honey as a gift from King of Egypt. Also he recommended that peoples not killed bees because they have a great role in the agriculture, medicine and nutrition

Bee products as immunopotentiation

History



- Apitherapy has a great attention allover the world.
- This prompted me to organize an International Symposium on Apitherapy where more than one thousand scientists were attended from 22 countries
- These symposiums discussed 54 scientific papers in all aspects of apitherapy.

Bee products as immunopotentiation

History

- The modern knowledge about the composition of every product gave the way for more demand of using such products in medicine

HIVE PRODUCTS

- Honey
  - Variable yields – 40 to 100 lbs/hive
  - Depends on amount of rainfall, temperature, hive strength
- Beeswax
  - Small yield from honey comb cappings
- Pollen
  - Gathering pollen can weaken hive

HIVE PRODUCTS

- Propolis
  - Tree sap collected by bees
  - Used by bees to patch small holes/cracks in hive that might harbor bacteria or pests

Honey

BEE PRODUCTS AS IMMUNOPOTENTIATION
HONEY

- Honey is composed of various sugars, flavonoids, phenolic acids, enzymes, amino acids, proteins, and miscellaneous compounds
- Its composition varies according to floral sources and origin

BEE PRODUCTS AS IMMUNOPOTENTIATION
HONEY

- **Honey is one of the oldest medicines**.
- Its use is recorded in Egyptian papyri dated from 1900 to 1250 B.C.
- It is also mentioned in the Holy Qu'ran
- used many of the Egyptian prescriptions.
- Honey found that "cleans sores and ulcers of the lips,
- heals carbuncles and running sores

HEALTHIEST BENEFITS OF SWEET HONEY

oney is a delicious natural liquid produced by honey bees a
e hard efforts.

oney bees gathering the nectar from flowers through a proc
evaporation and regurgitation.

s an oldest sweetener on the earth that has surprising hea
wers.

ere is no doubt that natural honey is a power house of he
nefits that fight against the many health problems.

- honey have many powerful qualities of antibacterial and antifungal properties.
- Honey is very famous around the world as a natural remedy and also used this sweet in the preparation of medicines.
- Honey is one of the best natural remedy that boost-up the immunity strength, improve the energy level and enhance the physical stamina.

BEE PRODUCTS AS IMMUNOPOTENTIATION
HONEY

- It is believed that consuming honey regularly prevents the risk of developing many diseases and help to make you live longer.
- Most of the peoples are not aware with the composition of honey, this natural liquid contain glucose, fructose and minerals such as potassium, magnesium, iron, phosphate etc.

Bee products as immunopotentiation Honey

- gives the best energy to the whole body
- Cleanses the digestive tract
- Stimulates the immune system
- Cures skin wounds
- Relaxes over-contracted muscles.

BEE PRODUCTS AS IMMUNOPOTENTIATION
HONEY

- honey used for many different purposes:
- as a laxative,
- as a cure for diarrhea
- Antimicrobial activity
- Anti fungal
- for coughs and throat maladies,
- to agglutinate wounds

BEE PRODUCTS AS IMMUNOPOTENTIATION
HONEY

- for eye diseases.
- Stomach upset
- treat dyspepsia and stomach ulcers
- treatment for gastro-intestinal infections
- Honey help to replace lost electrolytes and provide an energy source
- Honey had activity against a range of dermatophytes, i.e. fungi causing skin infections such as ringworm

BEE PRODUCTS AS IMMUNOPOTENTIATION HONEY

- anti-inflammatory
- antimicrobial
- antimutagenic
- antioxidant
- antitumor effects.

THE % OF DIFFERENT CONSTITUTE OF HONEY

Constituents	%
Water	16-20
Fructose	52.9
Glucose	20.4
Scurose	1-3
0ther sugrs	4
Protein	0.3
Nitrogen	0.04
Minerals	0.2
Others	3.46

IMMUNOPOTENTIATION HONEY

- Honey induces apoptosis in various types of cancer cells vi depolarization of mitochondrial membrane.
- Honey elevates caspase 3 activation level and *poly (ADP-ribose) polymerase (PARP)* cleavage in human colon cancer lines which is attributed to its high
- Honey generates ROS (reactive oxygen species) resulting i the activation of p53 and p53 in turn modulates the expres of pro- and antiapoptotic proteins like Bax and Bcl-2tryptophan and phenolic content

PREVENT THE RISK MUSCLE FATIGUE

- Muscle fatigue problem is normally associated with the athletes which can affect their performance level. Consuming sweet honey improves the stamina of athletes and also prevents the risk of muscle fatigue. The combination of glucose and fructose in sweet honey boost-up the energy level of the longer time.

HELPS YOU TO BETTER SLEEP

Honey has sleep-inducing properties which help you t
sleep well.

TREAT THE INDIGESTION PROBLEM

digestion is a common problem that sociated with the unhealthy lifestyle and oor dieting.

onsuming sweet honey helps in evention of indigestion and gas problem.

o always add this sweetener in your diet to minish the risk of indigestion and gas oblem.

HANCE IMMUNITY STRENGTH AND GULATE BLOOD SUGAR LEVEL

weet honey is acts as an immunity booster due to th resence of phytonutrients that stimulate antibody productio

eoples are always believed that sweet is not good for diabet atients but honey is a natural sweetener that helps in th **lood sugar regulation.**

nprocessed honey has the ability to control the bloo ugar level, so it is very healthy for diabet atients.

HONEY AND ITS ANTI-INFLAMMATORY AND IMMUNOMODULATORY ACTIVITIES

oney exhibits anti-inflammatory response.

henolic compounds in honey are responsible for anti-
flammatory activity

he mechanism involves the suppression of the
roinflammatory activities of COX-2 and/or inducible ni
xide synthase (iNOS) through these phenolic compoun
r flavonoids.

BEE PRODUCTS AS IMMUNOPOTENTIATION HONEY

- Manuka, Pasture, Nigerian Jungle, and are found to increase production of
- IL-1β,
- IL-6,
- TNF-α .
- This immunomodulatory activity

BEE PRODUCTS AS IMMUNOPOTENTIATION HONEY

- Honey stimulates antibodies, B and T lymphocytes, neutrophils, monocytes, eosinophils, and natural killer cells (NK-cells) production during primary and secondary immune responses in tissue culture.
-

BEE PRODUCTS AS IMMUNOPOTENTIATION HONEY

- It has been shown that honey stimulates macrophages, T-cells, and B-cells to provoke antitumor effect
- Immunoprotective activity of honey is often linked to anticancer action

BEE PRODUCTS AS IMMUNOPOTENTIATION HONEY

- honey may stimulate the immune system via these fermentable sugars .
- A sugar, nigerooligosaccharides (NOS), present in honey has been found to have immunopotentiating activity .
- Nonsugar components of honey may also be responsible for immunomodulation .

EE PRODUCTS AS IMMUNOPOTENTIATION ONEY

- The possible mechanisms of honey are due to its apoptotic
- antiproliferative
- antitumor necrosis factor (anti-TNF)
- antioxidant
- anti-inflammatory
- estrogenic
- immunomodulatory activities.

Pollen

BEE PRODUCTS AS IMMUNOPOTENTIATION
BEE POLLEN

BEE POLLEN improves:

- **the functions of the liver**
- **gives more strength to the heart**
- **gives all necessary amino acids to the nervous system.**

Bee products as immunopotentiation

Bee pollen

Improve the quality, quantity and circulation of the blood;

Improve the functioning of the adrenal glands, kidneys, liver, heart, and thymus,

thus helping the entire nervous system and body

BEE PRODUCTS AS IMMUNOPOTENTIATION
BEE POLLEN

- Bee pollen is a mixture of the pollens picked up by bees as they fly from one flower to another.
- Bee pollen is a popular folk remedy for many conditions, including PMS and enlarged prostate.
- It's also used as an energy tonic.

BEE PRODUCTS AS IMMUNOPOTENTIATION
BEE POLLEN

BEE POLLEN IS TRUE GIFT FROM MOTHER NATURE.

T CONTAINS MANY ESSENTIAL NUTRIENTS.

THE GREEKS CALLED IT THE "NECTAR OF THE GODS."

BEE POLLEN CONTAINS UP TO 35 PERCENT COMPLETE PROTEIN,

22 AMINO ACIDS,

B VITAMINS,

27 MINERAL SALTS,

TRACE ELEMENTS

AND SEVERAL ENZYMES. NSP BEE POLLEN IS NATURALLY DRIED TO PRESERVE VITAL ENZYI

BEE PRODUCTS AS IMMUNOPOTENTIATION

BEE POLLEN

- bee pollen might reduce some side effects of radiation herapy for cancer.

- chronic prostatitis or enlarged prostate.

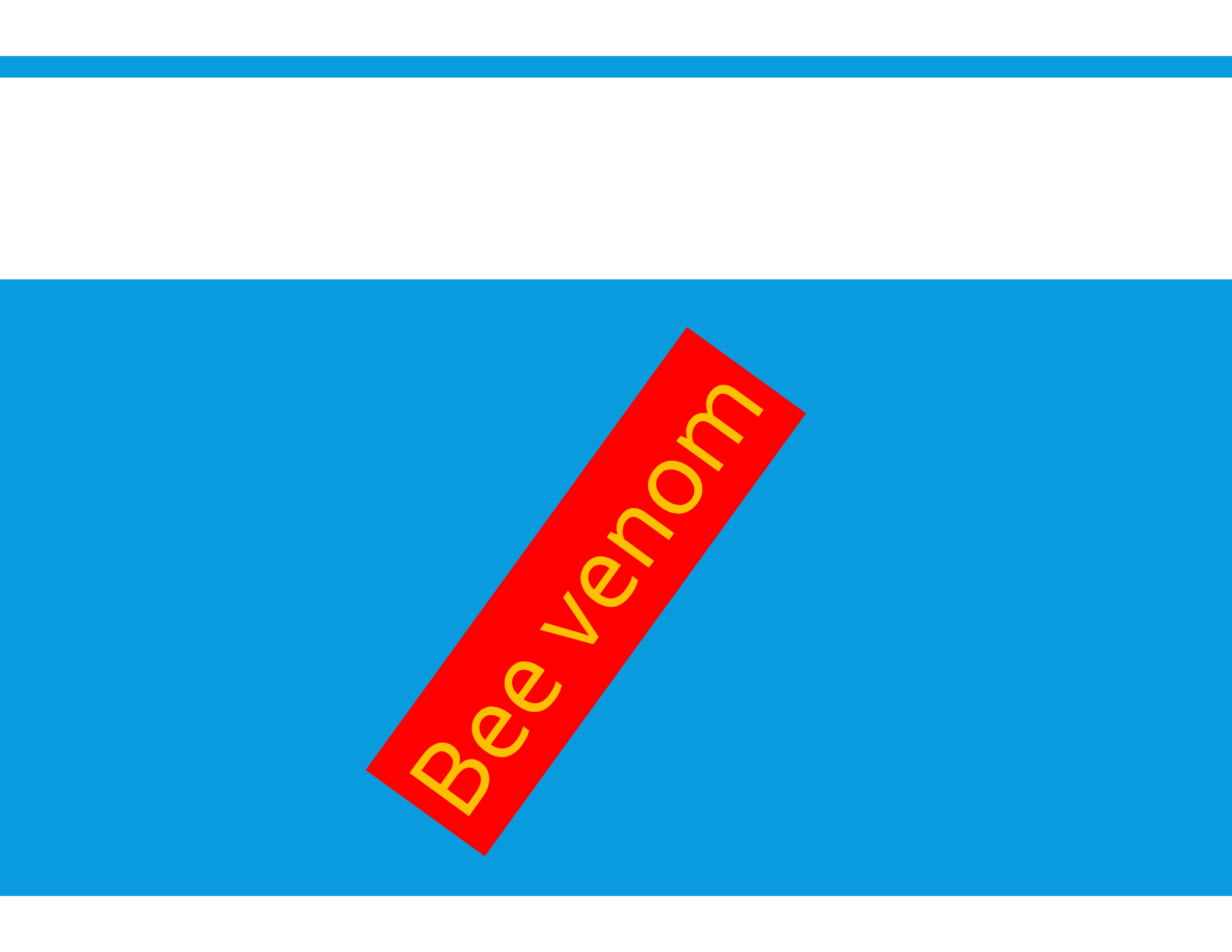
- Another study found that a product containing bee pollen and several other ingredients) seemed to reduce PMS ymptoms.

BEE PRODUCTS AS IMMUNOPOTENTIATION
BEE POLLEN

- Boosting natural energy and combating chronic fatigue
- Flagging spirits
- Aiding healing
- Regenerating the body and muscles
- Preventing allergies
- Lowering bad cholesterol
- Decreasing fatty deposits in the body
- With bee pollen, weight loss can also be achieved
- Preventing infections and disease
- Increasing your life span
- Giving you youthful and healthy skin
- Strengthening the immune system
- Detoxifying the body
- Increased vitality and energy
- Balance the hormones in your body
- Providing mental clarity

WHO IS BEE POLLEN BEST FOR?

- ✓ Anyone under stress
- ✓ Athletes and sports people
- ✓ Anyone who has a weak immune system
- ✓ Those recovering from illness
- ✓ Those with long term health conditions
- ✓ Anyone struggling with fatigue
- ✓ Those who are trying to lose or maintain their weight
- ✓ Those who want to boost their fertility


Bee venom

Bee products as immunopotentiation

Bee venom

- **BEE VENOM :**
- **Help patients having MS as well as auto immune diseases very much.**
- **Diminishes the inflammatory reactions in the affected areas**

Bee products as immunopotentiation

Bee venom

- Improves the blood circulation in the nervous system, and in the whole body.
- Increases the natural production of cortisol in the adrenal glands
- Gives more energy and stamina.

Bee products as immunopotentiation

Bee venom

- There are 78 different components in the bee venom.
- But not all these components are consistently present in every bee's venom.

Bee products as immunopotentiation

Bee venom

- There are six primary components which are through to provide the major therapeutic benefits of bee venom therapy (BVT).

Bee products as immunopotentiation

Bee venom

- Bee venom is made up of at least 18 pharmacological active compounds.
- Melittin
- Adolapin
- Apamin
- Phospholipase A1
- Phospholipase A2

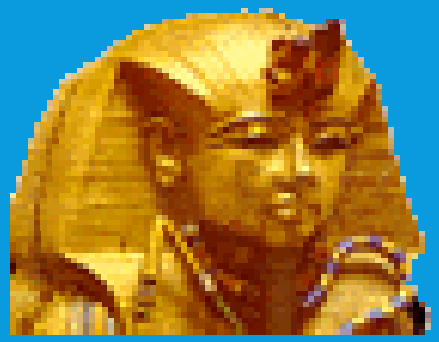
Bee products as immunopotentiation

Bee venom

- Hyaluronidase
- Histamine
- Mast Cell Degranulating Peptide (MCD)
- Dopamine
- Norepinephrine
- Compound X

Bee products as immunopotentiation

Bee venom



- Acid phosphatase
- Secapin
- Leukotrienes
- These compounds identified by(Schmidt, 1992)

Bee products as immunopotentiation

Bee venom

- **Immune system**
- Immune augmentation
- Systemic lupus erythromatosis
- AIDS
- T cell suppression
- B- enhancement

Bee products as immunopotentiation

Bee venom

- Bee venom contains a number of powerful anti-inflammatory substances, including adolapin and melittin.
- It is to be a hundred times more powerful than hydrocortisone,
- melittin stimulates the body production of cortisol, a natural steroid that also acts as an anti-inflammatory.

IN ADAPTIVE IMMUNE RESPONSE

- The effect of IL-10+ NK cells on Ag-specific cell proliferation has been examined in bee venom major allergen
- phospholipase A2- and purified protein derivative of *Mycobecterium bovis*-induced T cell proliferation.

Bee products as immunopotentiation

Bee venom

Moon et al., (2007) investigated the anti-inflammatory effect of BV and its major component, melittin (MEL), on lipopolysaccharide (LPS)-stimulated BV2 microglia.

Their findings indicate that BV and MEL exert anti-inflammatory effects by suppressing the transcription of cyclooxygenase (COX)-2 genes

and proinflammatory cytokines, such as interleukin (IL)-1beta, IL-6 and tumor necrosis factor (TNF)-alpha.

BEE VENOM (BV)

- These results demonstrate that BV and MEL possess a potent suppressive effect on proinflammatory responses of BV2 microglia

Also suggest that these compounds may offer substantial therapeutic potential for treatment neurodegenerative diseases that are accompanied by microglial activation.

BEE VENOM (BV)

- Mellitin had no effect on IL-1beta- or TNF-alpha-induced MMP1 or MMP3 production and did not decrease LPS-induced secretion of MMP1.
- Among the serum proinflammatory cytokines, the production of TNF-alpha in the BV group was suppressed compared to the control group but IL-1beta was not suppressed.

BEE VENOM (BV)

n vivo bee venom treatment affects the
production of IL-1 by macrophages directly ,
(Hadjipetrou-Kourounakis and Yiangou1988).

BEE VENOM (BV)

Korean bee venom (KBV) has anti-inflammatory properties that inhibit *NOS* and TNF-α expression.

KBV could be useful in inhibiting the production of inflammatory cytokine and NO production in neurodegenerative diseases (Han et al., 2007).

BEE VENOM (BV)

egazi et al., (2013) found that Propolis and b
enom are effective in treatment of psoriasis,
ith minimal tolerable side effects, when use
ither separately or in combination.

ignificant reduction in both PASI score and
erum level of IL-1β was observed in all group
f patients.

BEE VENOM (BV)

- Correlation between percentage reduction of PASI score and that of IL-1 β showed a strong positive correlation in group I received bee venom.

BEE VENOM (BV)

Continuous exposure of non-allergic beekeepers to high doses of bee venom antigens induces diminished T cell-related cutaneous late-phase swelling to bee stings in parallel with suppressed allergen-specific T cell proliferation and T helper type 1 (Th1) and Th cytokine secretion.

BEE VENOM (BV)

eiler et al., (2008) found after multiple bee
ings, venom antigen-specific Th1 and Th2 ce
ow a switch toward interleukin (IL) 10-
creting type 1 T regulatory (Tr1) cells.

cell regulation continues as long as antigen
xposure persists and returns to initial levels
thin 2 to 3 mo after bee stings.

BEE VENOM (BV)

- Histamine receptor 2 up-regulated on specific Th2 cells displays a dual effect by directly suppressing allergen-stimulated T cells and increasing IL-10 production

BEE VENOM (BV)

Kim et al., (2008) found that bee venom. injected i.p a doses of more than 20 microl/100g mouse once a day for 14 days

inhibited the ability of inguinal lymph node cells to produce

- **T cell cytokines interleukin-1 beta, -2, -6,**
- **tumor necrosis factor-alpha**
- **and interferon-gamma.**

BEE VENOM (BV)

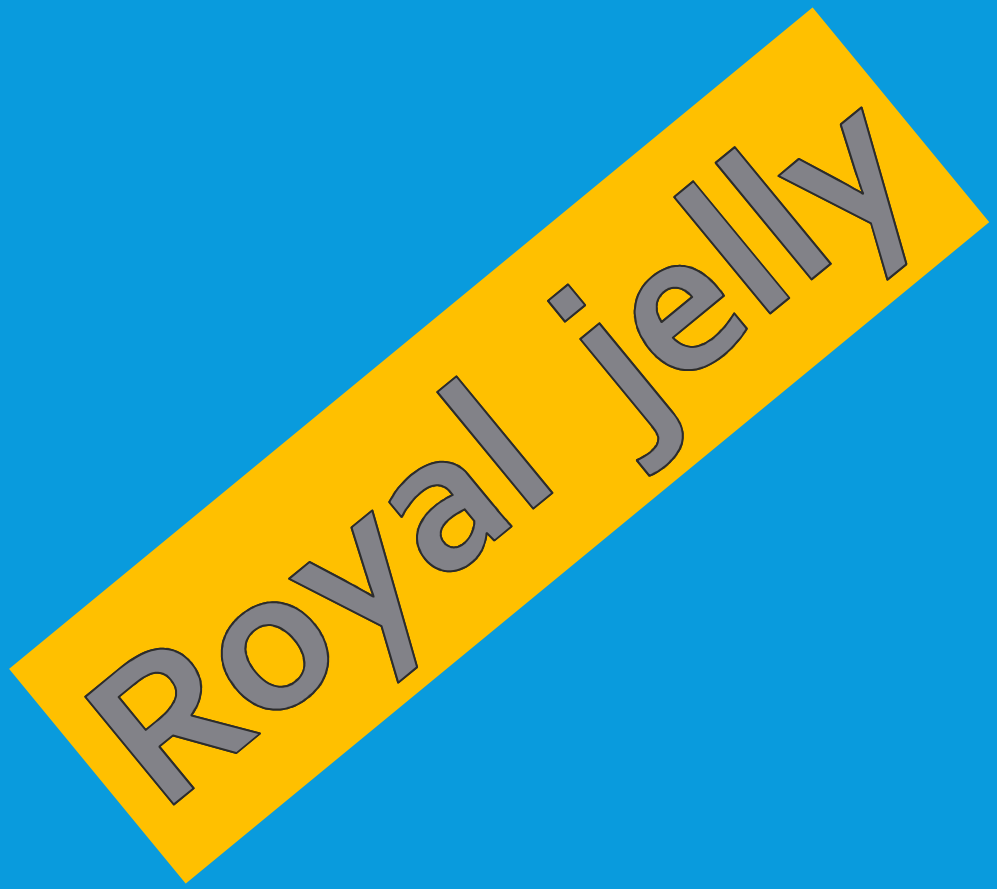
- sensitization against bee venom was strongly enhanced during treatment with antihistamines.
- Clemastine increased IgE production while decreasing IgG2a production against bee venom.
-

BEE VENOM (BV)

his T-helper type 2 shift of the humoral response appeared
e caused by reduced IFN-gamma and enhanced IL-4
ecretion from allergen-specific T cells.

hey also found reduced TNF-alpha, IL-6 and major
stocompatibility complex class-II expression by
acrophages.

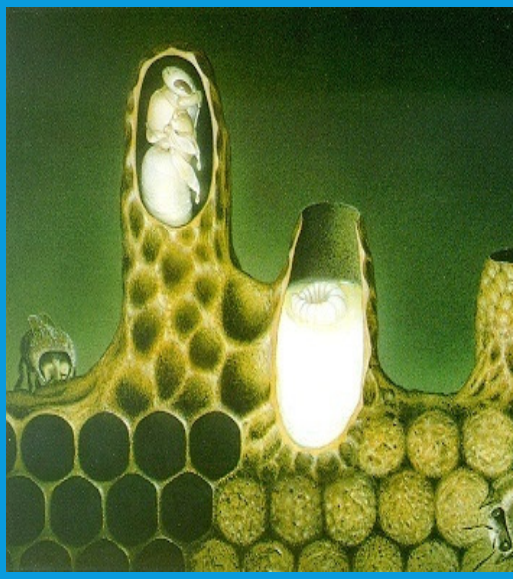
sensitized mice, the efficiency of allergen-specific
mmunotherapy was reduced by clemastine treatment.


Royal jelly

Bee products as immunopotentiation

ROYAL JELLY

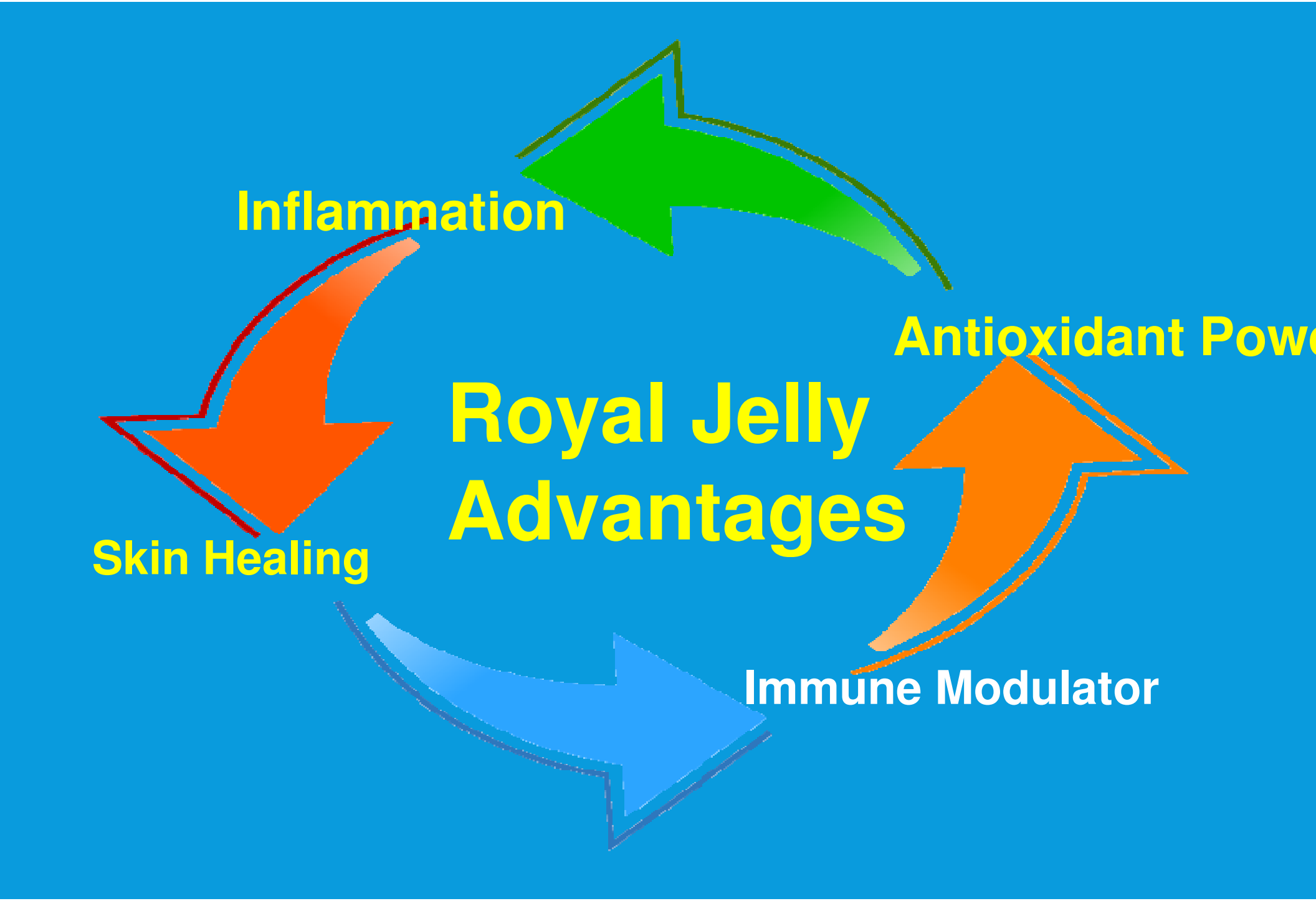
- ROYAL JELLY
- Improve the quality of the cellular regeneration
- To fight against auto-immune diseases
- Increase longevity
- It is the perfect food of Mother Nature



ROYAL JELLY

What is Royal Jelly

oyal jelly is a thick, milky substance,
ith a composition similar to pollen,
ade by the worker bees to feed the eggs
nd the queen bee.


Inflammation
Antioxidant Powe
Royal Jelly
Advantages
Skin Healing
Immune Modulator

ROYAL JELLY

- royal jelly honeys are found to increase production of
- IL-1β,
- IL-6,
- TNF-α .
- This immunomodulatory

Royal jelly contains complex B vitamins, amino acids, fatty acid
minerals, enzymes, natural antibiotic properties, and antibacter
properties.

Royal jelly is known for its anti- aging, cholesterol-loweri
anti-inflammatory, wound healing, antibiotic components
and antibacterial agents.

ROYAL JELLY

- Royal jelly (RJ) proteins (apalbumin-1 and apalbumin-2) in honey have antitumor properties.

- These proteins stimulate macrophages to release cytokines TNF-α, interleukin-1(IL-1) and interlueken-6 (IL-6)

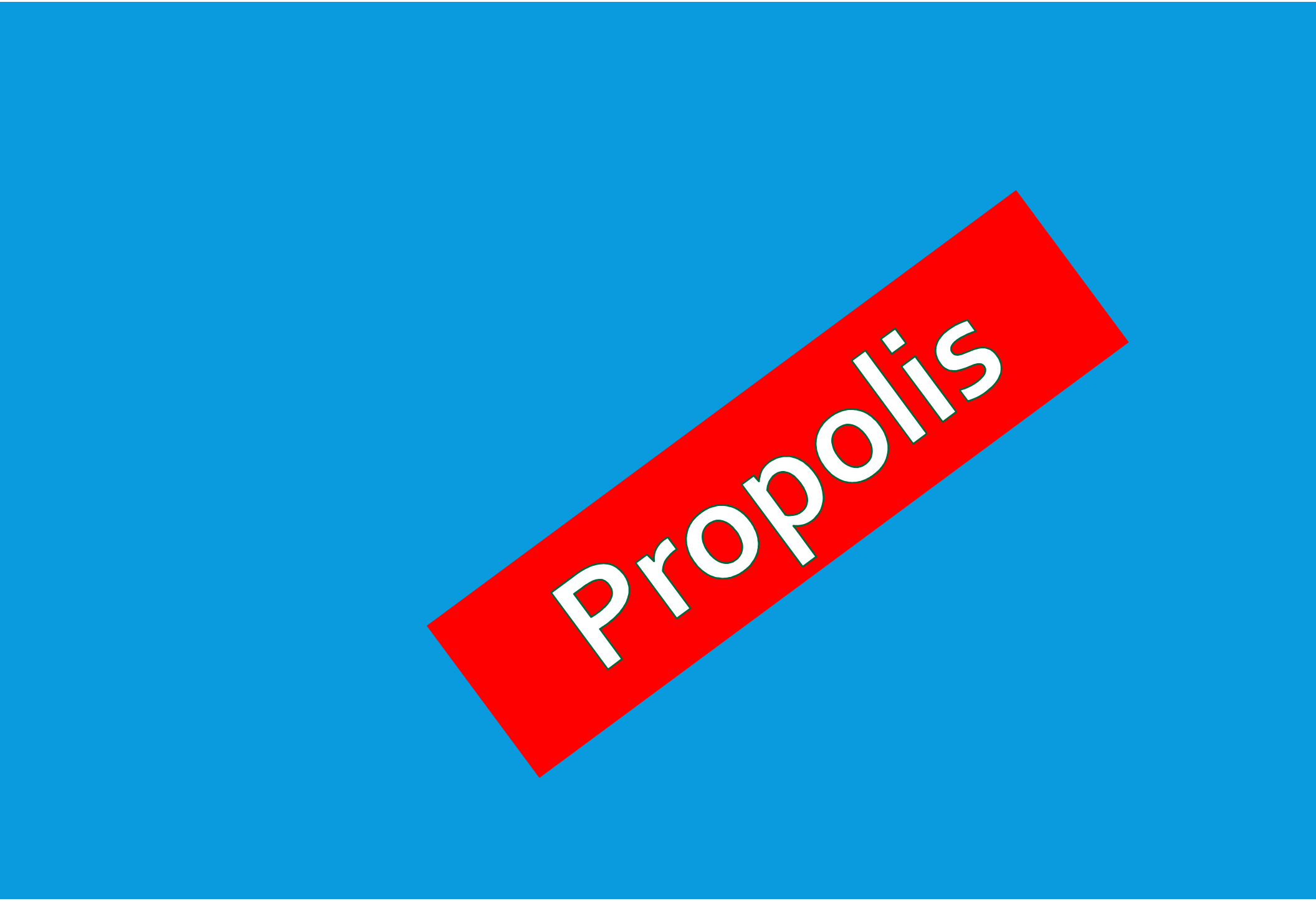
ROYAL JELLY

asture, jelly bush, and Manuka honeys (at concentratio
f 1% w/v) stimulate monocytes to release tumor necros
ctor-alpha and interleukin- (IL-) 1β and IL-6

ne possible mechanism involves the binding of TNF-R t
NF-α and adaptor protein such as TNFR associated dea
omain protein (TRADD), TNF receptor associated facto
TRAF), and receptor-interacting protein (RIP) to regula
poptosis and inflammation through these cytokines

ROYAL JELLY

- This TNF-α release can play a pivotal role as a key cytokine to regulate important cellular processes such as apoptosis, cell proliferation, and inflammation


Propolis

WHAT IS PROPOLIS?

- It is a powerful defence system produced by nature.
- Natural anti-oxidant play a measure role in it.

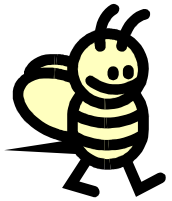
mixture of resin and sap is used to
roduce Propolis

uds of conifer and poplar
rees +beeswax + other bee
ecretions = ***Propolis***

Bee products as immunopotentiation
PROPOLIS

- Propolis, or "bee glue," is a well-known substance that beekeepers find in their hives.

ROPOLIS



- Essentially the “glue” in bee hives.
- Made of plant resin.
- Preserves warmth in hive and keeps out microbes.
- Has various antimicrobial properties.
- Used for healing and part of “apitherapy”.
- Interesting uses including violin varnish.
- Used since the Ancient Greeks and Romans discovered it.

PROPOLIS IN THE HIVE

(Kulincevica & Gacica, 1991)

MAJOR COMPONENTS

- Caffeic acid phenethyl ether or CAPE.
- Phenolics
- Terpenes
- Hydrocarbons
- Acids
- Flavonoids

USES OF PROPOLIS

- Dentistry procedures
- Treating Herpes simplex virus type 1 and 2
- Parasitic infections
- Burns
- Canker sores
- Colds (Prevention and treatment)
- Dental pain and plaque
- Gingivitis
- Fungal infections
- Legg- calve-Perthes disease
- Rheumatic diseases
- Stomach ulcers
- Vaginitis

Propolis is used by many.

Some pharmaceutical giant companie have special R&D for Propolis.

PROPERTIES OF PROPOLIS IN GENERAL

- Stimulates antibody production.
- Inhibits viral entry into CD_4 lymphocytes, especially against HIV-1.
- Increases effectiveness of antiviral drugs such as the reverse transcriptase inhibitor, zidovudine.
- Treats opportunistic infections that plague AIDS patients.
- Decreases lymphocyte proliferation when exposed to mitoge such as ConA.
- Increases production of IFN-γ and activates macrophages.

INTERESTING PROPERTIES OF CAPE

- Inhibits Nuclear Transcription Factor Kappa B or NF-κB, which drives T-cell proliferation and effector functions.
- Anti-inflammatory activity.
- Treats arthritis and inflammatory bowel disease
- Inhibits IL-2 which also drives T-cell proliferation

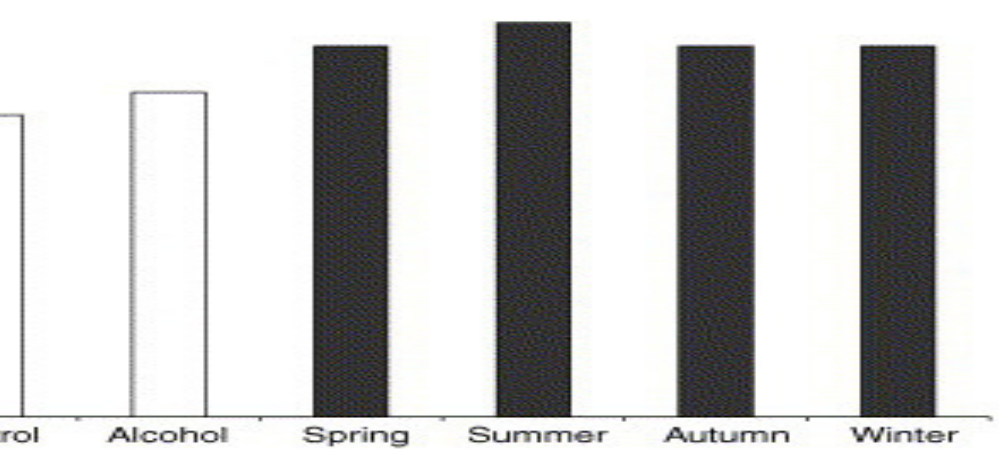
Bee products as immunopotentiation PROPOLIS

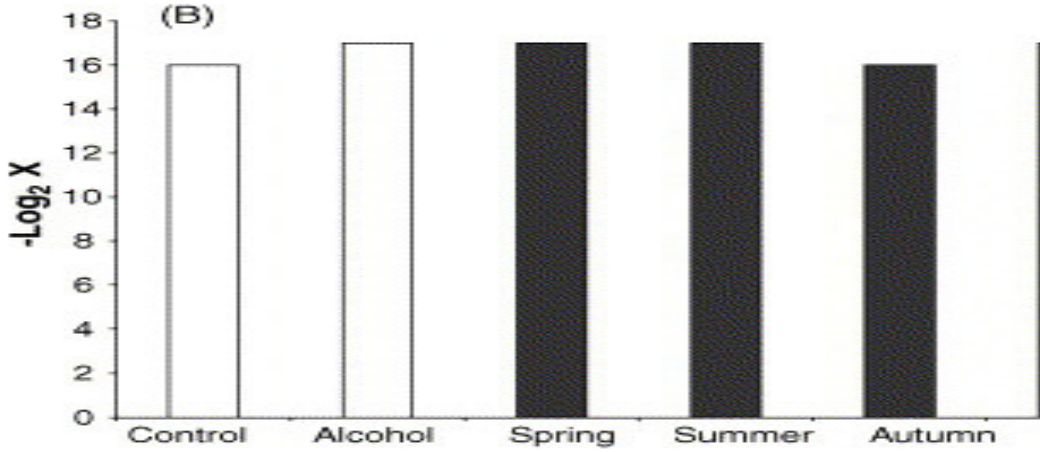
- **PROPOLIS : Acts as**
- Very good immune-modulator.
- It stimulates the activity of the thymus
- It has anti-viral
- anti-inflammatory
- Regenerative
- Anti-toxic properties
- It strengthens the cellular membranes of the body
- Antioxidant

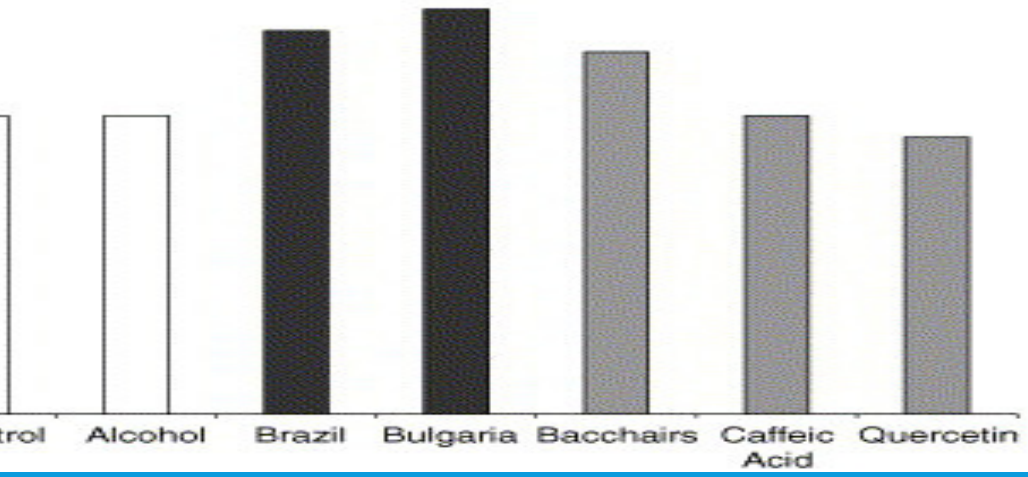
INCREASED ANTIBODY PRODUCTION

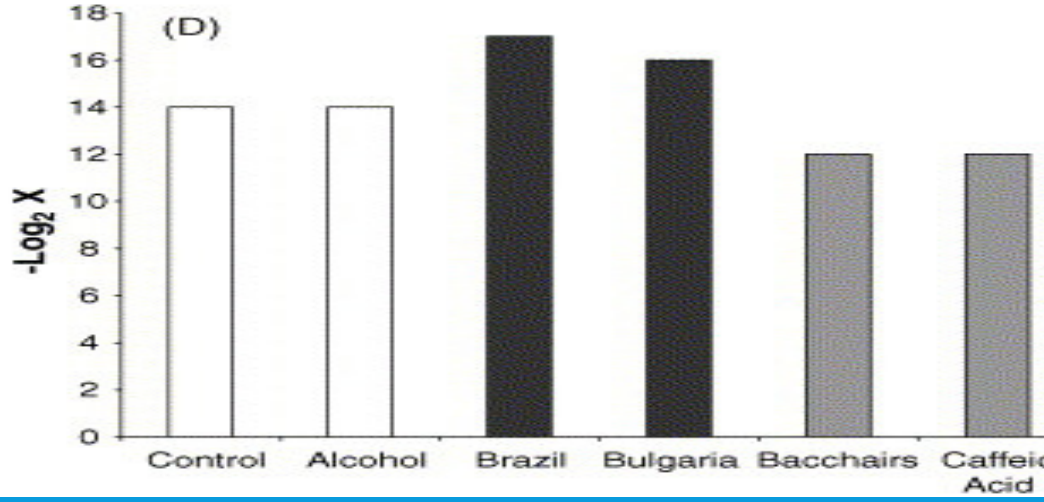
- Propolis was shown to increase antibody production in rats immunized with bovine serum albumin.
- Acted as adjuvant.
- Enhanced the activity of macrophages.

INCREASED ANTIBODY PRODUCTION







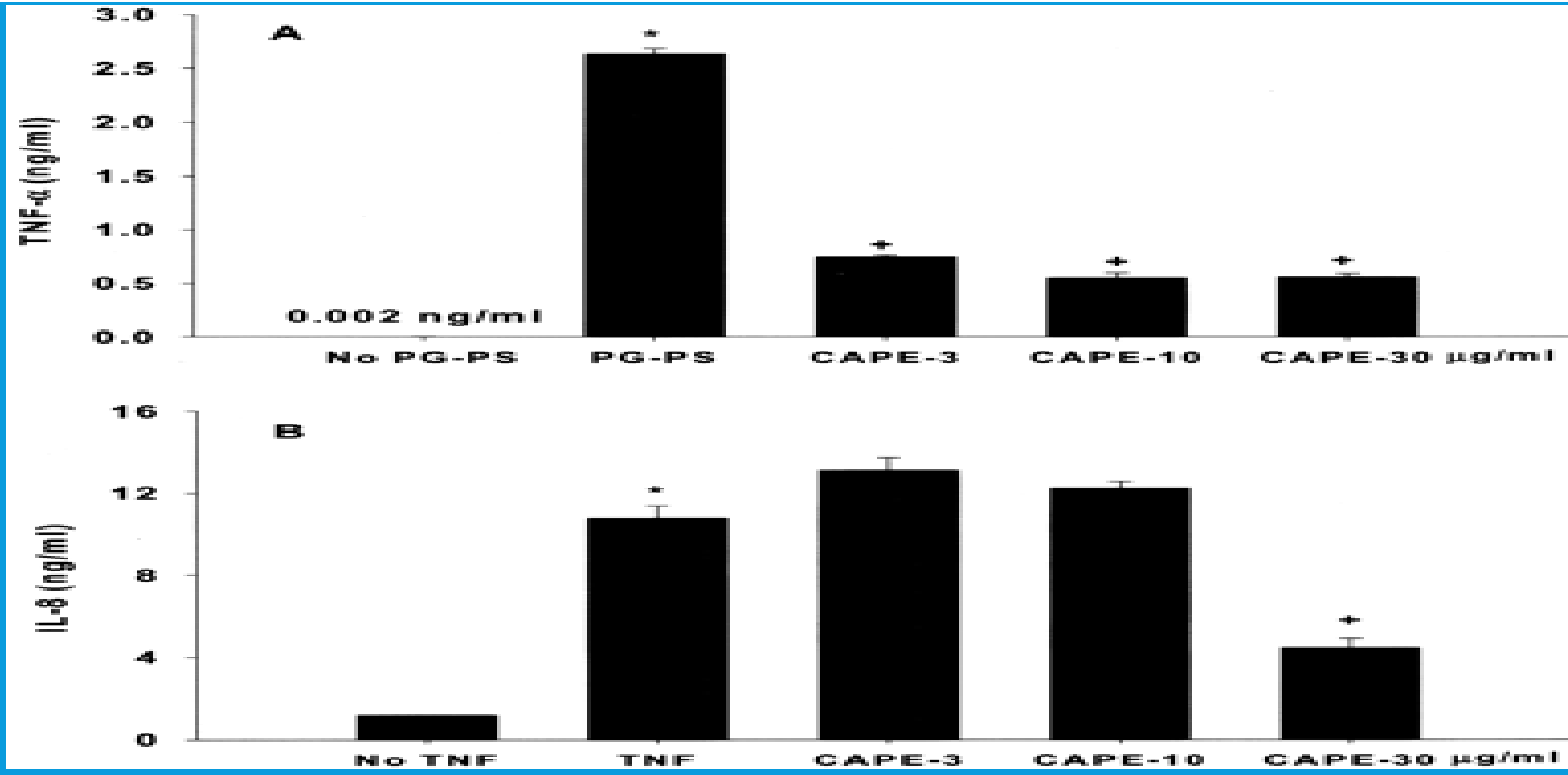


(Sforcin, Orsi, & Bankova, 2005)

INHIBITION OF NF-KB

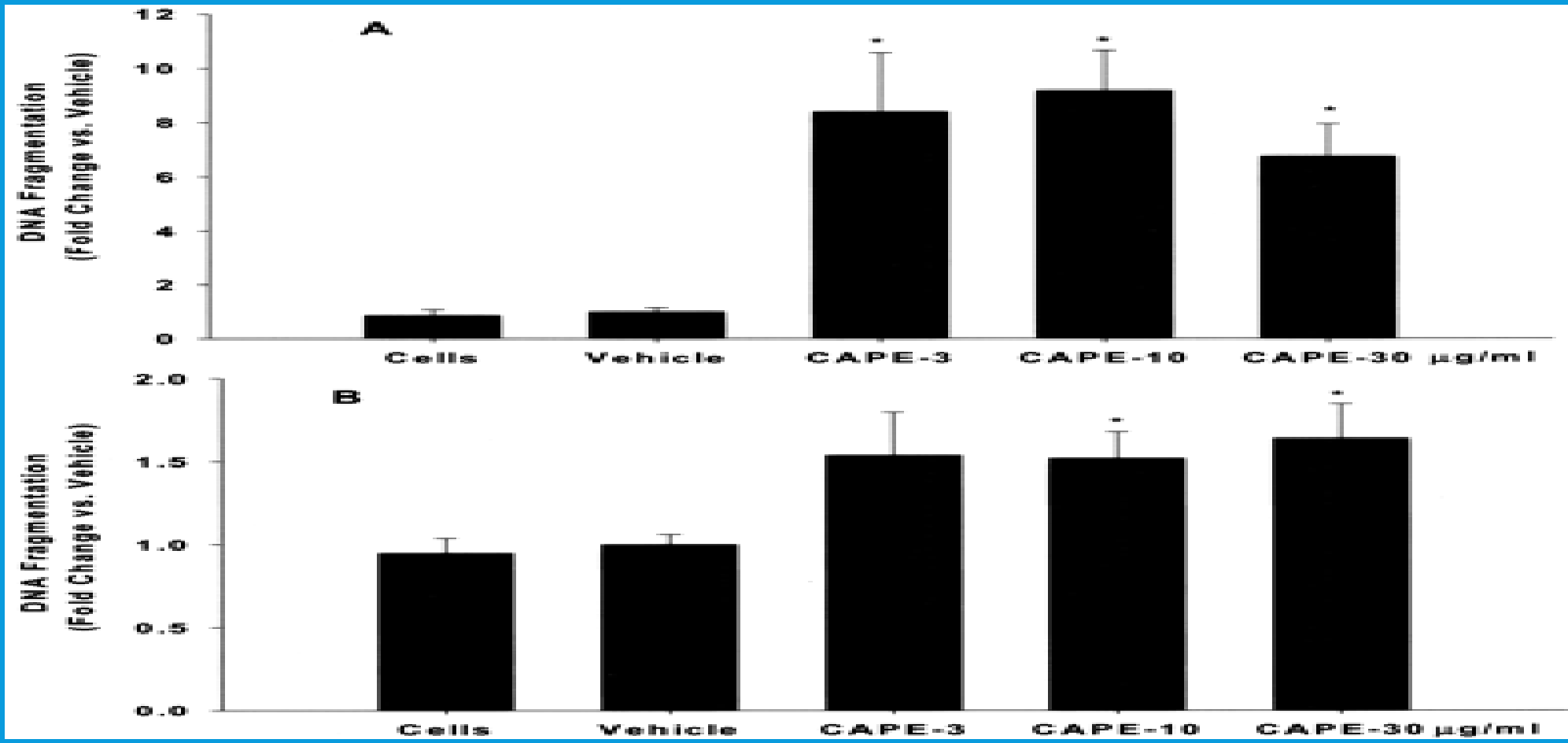
- CAPE inhibited NF-κB binding to macrophages and decreased cytokine production.
- Tumor necrosis factor alpha, TNF-α, which stimulates macrophages to kill tumor cells was used to see if NF- would bind.
- Anti-inflammatory activity.
- Macrophages underwent apoptosis in patients with IB leading to healing of the injuries to the colon.

INHIBITION OF NF-KB



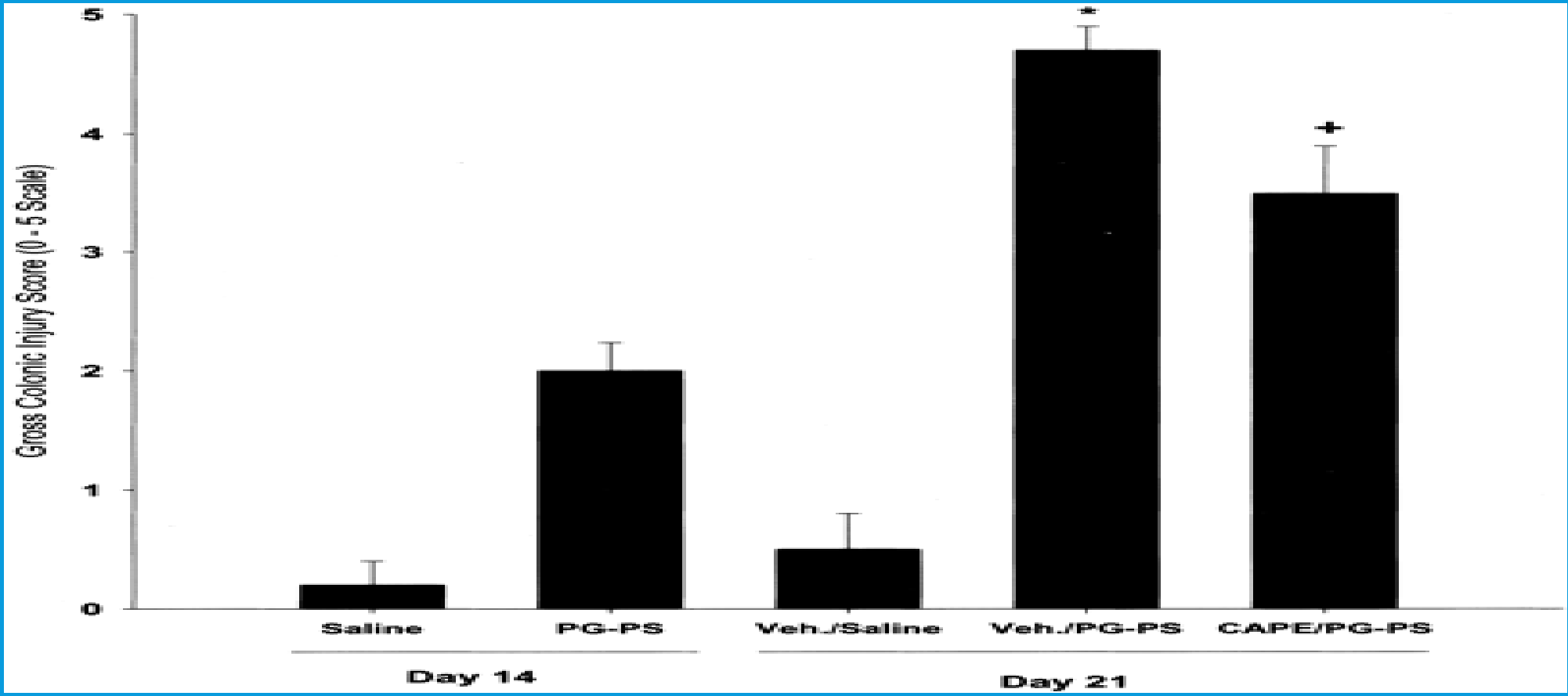
(Fitzpatrick, Wang, & Le, 2001)

CAPE INDUCES APOPTOSIS IN MACROPHAGES IN PATIENTS WITH IBD



(Fitzpatrick, Wang, & Le, 2001)

CAPE REDUCES INJURY TO THE COLON



(Fitzpatrick, Wang, & Le, 2001)

INHIBITION OF IL-2

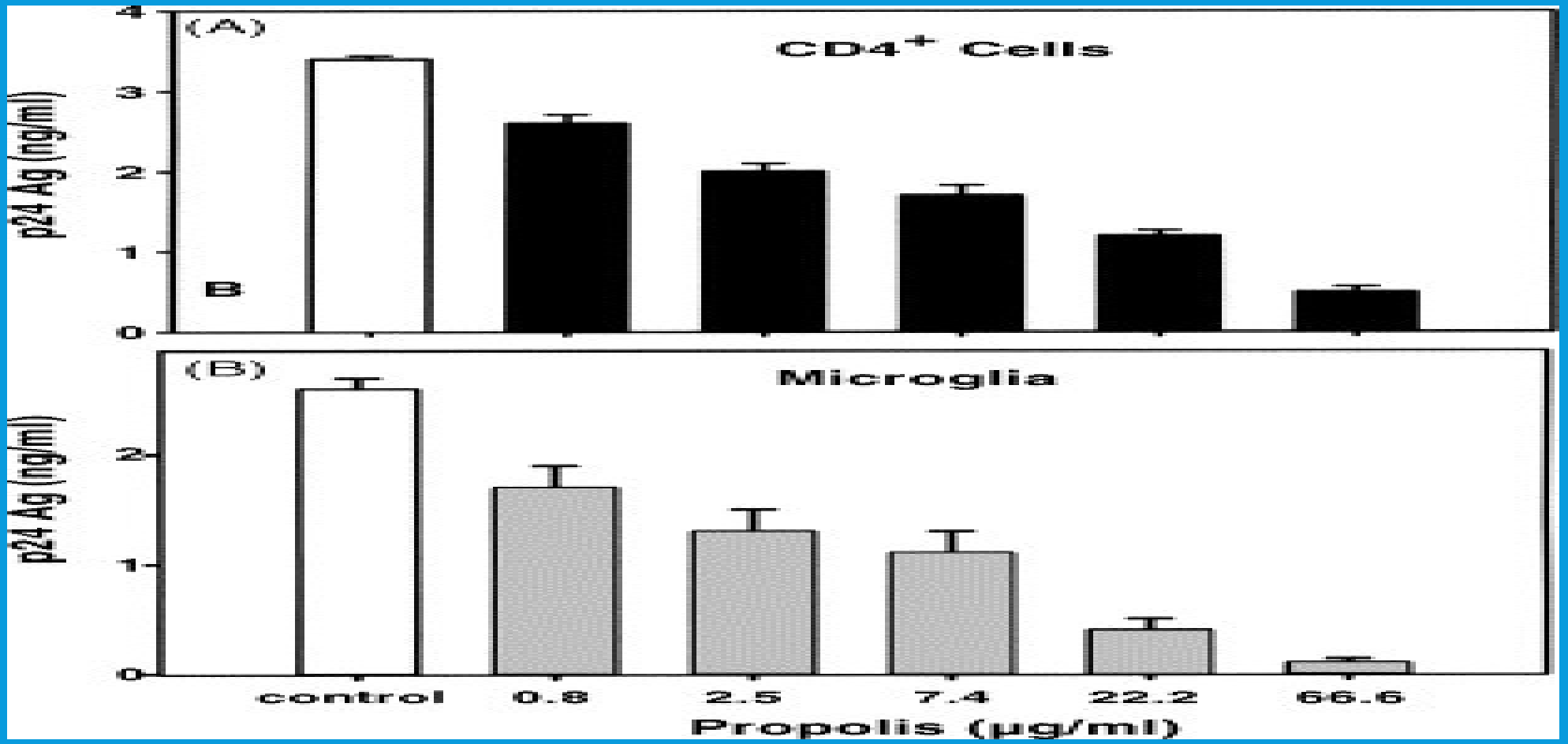
APE inhibited IL-2 leading to anti-
flammatory activity.

-cell proliferation was inhibited in samples w
on-A, a mitogen, added.

ANTI-VIRAL ACTIVITY

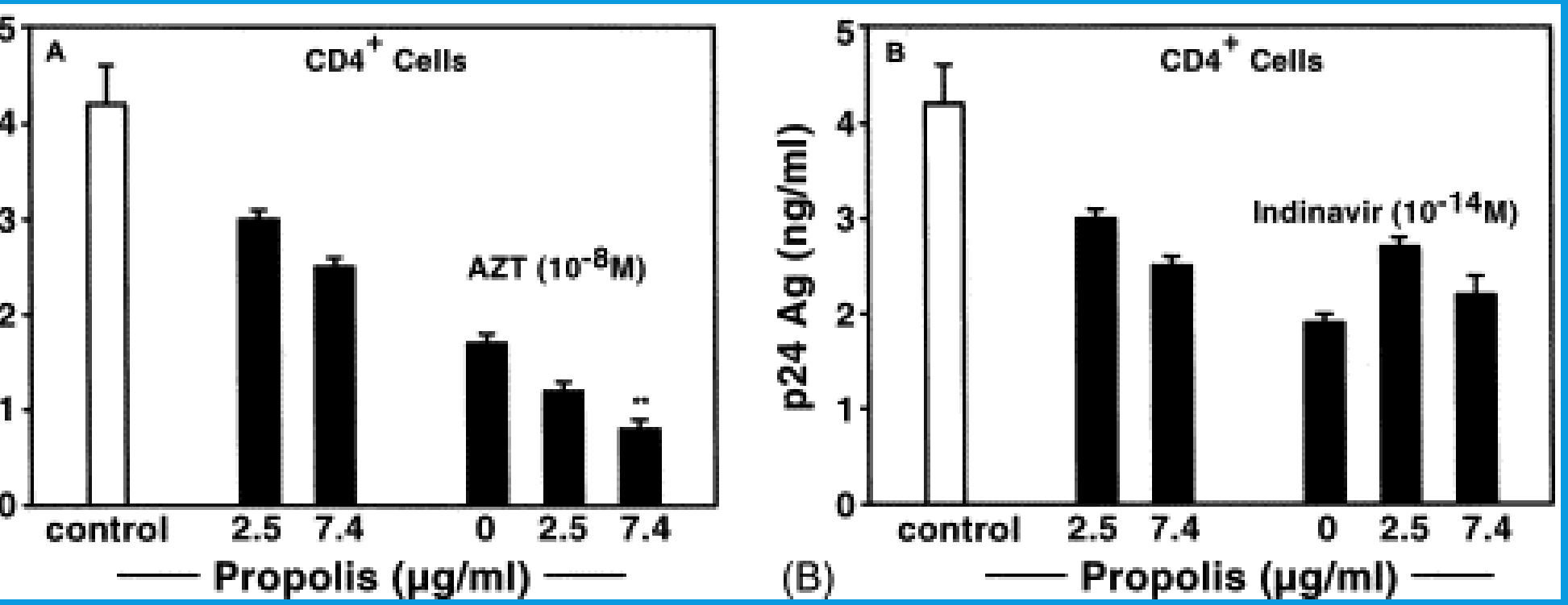
- Viral entry of HIV-1 was inhibited in CD_4 lymphocytes.
- Effectiveness of the reverse transcriptase inhibit zidovudine, was increased.
- Virus was kept from proliferating.

PROPOLIS DECREASED VIRAL EXPRESSION IN CD_4 CELLS



(Gekker, Hu, Spivak, Lokensgard, & Peterson, 2005)

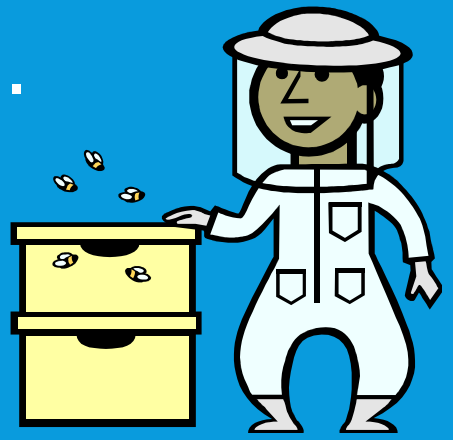
PROPOLIS INCREASES EFFECTIVENESS OF ANTI-VIRAL DRUGS



(Gekker et. al, 2005)

TREATMENT FOR AIDS PATIENTS

- Propolis treats opportunistic fungal infections such a thrush and leukoplakia.
- Kept infections from coming back and alleviated symptoms.
- Increased the immune response.



INCREASED PRODUCTION OF IFN-γ

Propolis increased IFN-γ production leading to the antigen being presented on cells and the immune response starting to clear it faster.

Mitogen infected cells did not show proliferation that would normally happen.

Kept mitogen from working.

Bee products as immunopotentiation PROPOLIS

- It was also clear that propolis extract caused an increase in the weight of lymphoid organs of chicks.
- Furthermore, propolis extract treated group was the highest in the (NDV) antibodies titer (4.9, 6.4 and 7.7) when compared with control group (2.7, 2.2 and 1.9) on 14, 21 and 28 days respectively.

- Dietary flavonoids are known to affect the proliferation, differentiation, and apoptosis of cancer cells and may play an important role in cancer
- chemoprevention, especially for cancers of the gastrointestinal tract, because of their direct contact with food.

- CAPE inhibition of cell proliferation and apoptosis are alternative responses to oxidative stress
- the particular response may depend on cellular redox status at a given time

- Kimoto et al. 1998 reported that artepilin C (a component of propolis) has cytostatic and cytotoxic effects on various malignant tumor cells in vitro and in vivo
- It activates the immune system, especially by increasing the number of macrophages and their phagocytic activity as well as the number of lymphocytes, and has direct antitumor activity

Bee products act upon both innate and adaptive immune response

Bee products act upon both innate and adaptive immune response

- At different levels, in the human innate response, these compounds suppress
  - DNA synthesis,
  - decrease proinflammatory cytokine synthesis (IL 2, IL-12 and IL-4),
  - inactivate both the classical and alternative complement pathway,
  - decrease superoxide anion production in neutrophils.

IN ADAPTIVE IMMUNE RESPONSE

propolis and honey induce the increase of antibody production by plasma cells,

enhance the secretion of TGF-β after the activation of T regulatory cells,

inhibit Con A-stimulated cell proliferation in mice (Cova, 2013).

IN ADAPTIVE IMMUNE RESPONSE

The effect of IL-10+ NK cells on Ag-specific T cell proliferation has been examined in bee venom major allergen phospholipase A2- and purified protein derivative of *Mycobecterium bovis*-induced T cell proliferation.

IN ADAPTIVE IMMUNE RESPONSE

- IL-10+ NK cells significantly suppressed both allergen/Ag-induced T cell proliferation and secretion of IL-13 and IFN-gamma, particularly due to secreted IL-10 as demonstrated by blocking of the IL-10 receptor.

IN ADAPTIVE IMMUNE RESPONSE

- These results demonstrate that a distinct small fraction of NK cells display regulatory functions in humans.

CONCLUSION

- From the over mentioned date it could concluded that:
- Bee products is safe
- non toxic
- no cumulative activity
- Immunopotentiation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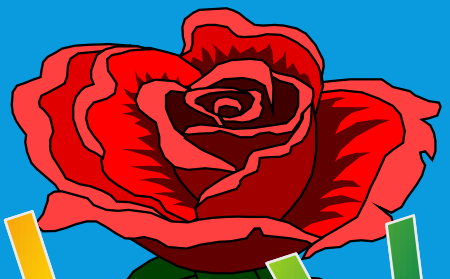
NATIONAL RESEARCH CENTRE

Bee products as immunopotentiation

Bee products as immunopotentiation

Ahmed G. Hegazi
National Research Center, Egypt



Thank you

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