
بسم الله الرحمن الرحيم


المركز القومي للبحوث
NATIONAL RESEARCH CENTRE


• Special thanks to the Organizing Committee of Animal Health 2016
• for their invitation to Valencia, Spain
• **Valencia, 26-27 September, 2016**

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

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VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- 1-Introduction
- 2-History
- 3- Application
  - Surgery
  - Dermatology
  - Pharmacology
  - Anticancer
  - Immunology
  - Antiviral activity
  - Antibacterial activity
  - Antifungal activity
  - Antioxidant activity
  - Ophthalmology

Medical Importance of bee products

1- 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.



Medical Importance of bee products

1- Introduction

- Apitherapy is the branch of medicine that deals with treatment using bee products,

Honey Bee Biology



Honey Bee (*Apis Mellifera*)



- Colony
  - Eusocial
  - Cavity Dwellers
  - Produce Surplus Honey

Cast

- Honey bees have 3 cast
  - Queen
  - Worker
  - Drone



Queen

- Lays eggs
- Emits pheromones
- Normally only one



Worker

- Work
- 95-99% of the colony



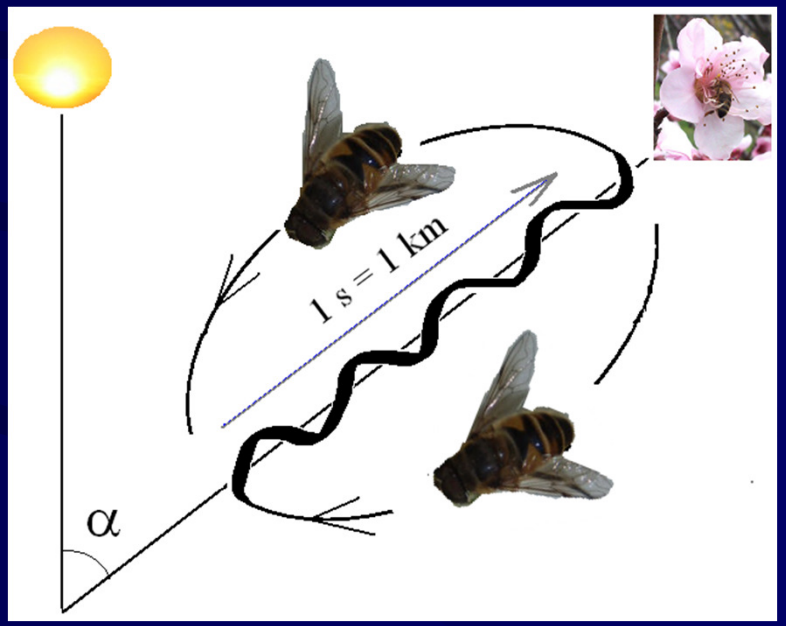
Drone

- Mates with queen
- 0-5% colony



Communicate

- Dance
- Pheromones





Obviously, honey bees are important for honey production…

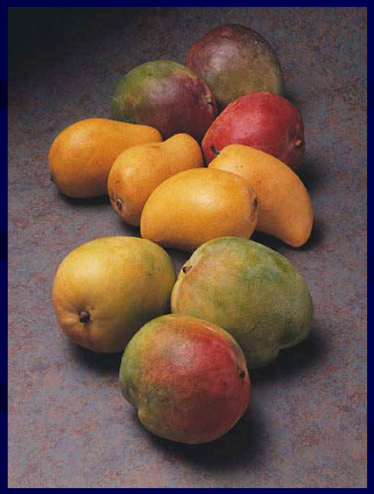
Crop pollination


MERCED COUNTY: SPRING ALMOND 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,**
- **pollen,**
- **bee bread,**
- **royal jelly,**
- **propolis,**
- **apitoxin or bee venom,**
- **hive air,**
- **comb beeswax,**
- **drone larvae,**
- **and whole bees enteras)**

- for nutrition,
- health
- life quality
- improvement,
- prevention and treatment of diseases,
- and 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.
- Almost no secondary effects.
- In cases catastrophes, epidemies, wars, and disasters,
- Apitherapy is available for poorest countries and with better results than many expensive medical procedures.

Apitherapy Products

- Available for everyone
- Synergic with antibiotics and other medications.
- Rich nutrients.
- 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 burns,
- tissue preservatives,
- immunostimulants,
- and other healing resources.

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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 of evil spirits or their poisons, and cleansing the body was the way to rid the body of their influence.

- Incantations, prayers to the gods - above all to Sekhmet

DRUG THERAPY

- Combination of pharmacology and magic
- "to balance the metu"
- Drugs from plant, mineral and animal kingdom
- Dosage very specific as well as the drug prescription
- Why honey as main ingredient?
- Other drugs available

THE MEDICAL PAPYRI



- The first medical texts, date from late 12th Dynasty to 20th Dynasty (2000-1090B.C)



- Seven medical papyri:

Seven medical papyri:









- **The Kahun Gynecological Papyrus**
- **The Ebers Papyrus**
- **The Edwin Smith Surgical Papyrus**
- **The Hearst**
- **The Chester**
- **The Berlin**
- **The London**



- Papyrus Ebers is devoted to:
- medicinal treatment of diseases
- surgical interference
- cosmetics

History

Prehistory

Modern Medicine

Ancient Egypt





Ebers Papyrus Circa 1500BC

- Use of Lint
  Animal grease
  Honey





Greece

- Differentiation of Acute and Chronic wounds
- Silver to control bodily infections
- Galen of Pergamum a Greek Surgeon served Roman Gladiators

811 prescriptions are forth in the papyrus. They takes the form of:

- Gargles
- Salves
- Plasters
- Poultices
- Snuffs
- Inhalations
- Draughts
- Confections
- Pills
- Fumigations
- Suppositories
- Enemata

Medical Importance of bee products

2-History



Honey found in 147 prescriptions for external use and in 102 for internal use.

Medical Importance of bee products

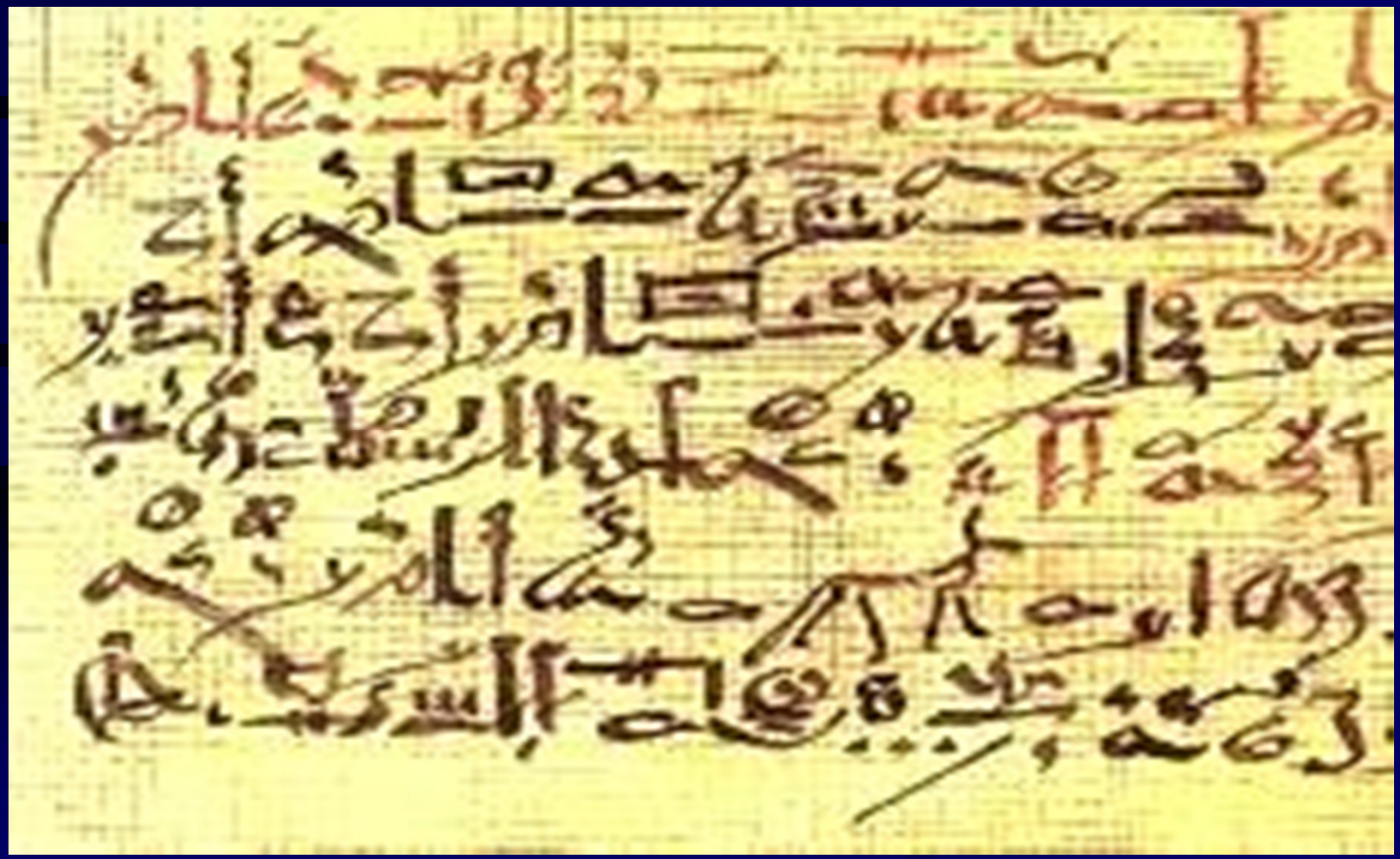
2-History



In Ancient Egypt much honey was sacrificed in religious ceremonies.



Excerpt from the Edwin Smith Papyrus



Medical Importance of bee products

2-History

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

Medical Importance of bee products

2-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”.

- قال الله تعالى" بسم الله الرحمن الرحيم وأوحى ربك إلى النحل أن أتخذى من الجبال بيوتا ومن الشجر ومما يعرشون ثم كلى من كل الثمرات فأسلكى سبل ربك ذللا يخرج من بطونها شراب مختلف ألوانه فيه شفاء للناس إن فى ذلك لآية لقوم يتفكرون " (النحل : 68 و 69)

Medical Importance of bee products

2-History

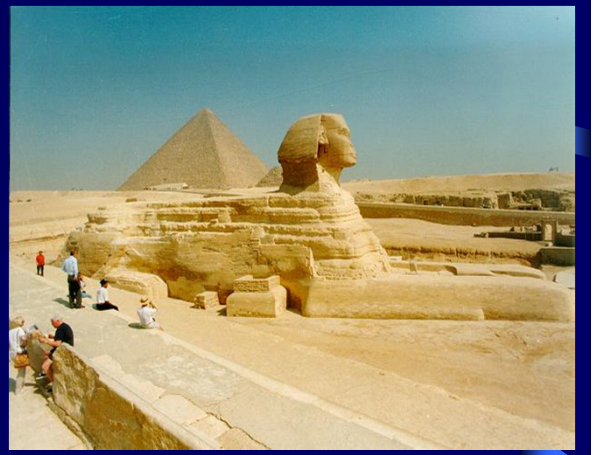
- In the Holy Hadeth The prophet Mohammed mentioned 23 Hadeth. He described the Moamens like bees and he prefer honey as a food.



Medical Importance of bee products

2-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



Medical Importance of bee products
2-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.

Medical Importance of bee products
2-History

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

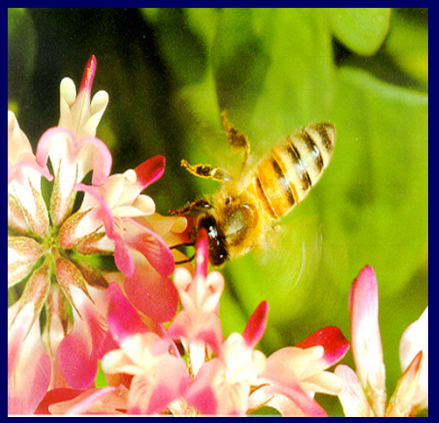
Medical Importance of bee products

Main goal

Apitherapy has its main goals to:

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

BEE POLLEN



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

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- 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

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- **BEE VENOM :**
- In human help patients having MS as well as auto immune diseases
- It diminishes the inflammatory reactions in the affected areas
- It improves the blood circulation in the nervous system, and in the whole body.

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- Bee venom also increases the natural production of cortisol in the adrenal glands
- it gives more energy and stamina.

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

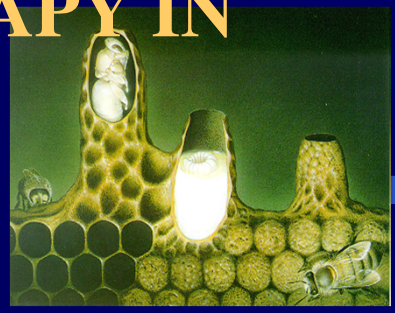
- **HONEY**
- gives the best energy to the whole body
- Cleanses the digestive tract
- Stimulates the immune system
- Cures skin wounds
- Relaxes over-contracted muscles.



VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- **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

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT



- **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**

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Veterinary Apitherapy in Egypt

3- Application

* - Surgery

- The evaluation of the therapeutic efficiency of honey in septic and aseptic wound in animals using honey was carried out by El banby et al. (1989).

3- Application

* - Surgery

- They concluded that any kind of honey initiates the wound healing process if either taken orally or applied directly as a dressing also a rapid acceleration of wound healing caused by true floral honey.

Veterinary Apitherapy in Egypt

3- Application

* - Surgery

- El Fikky and Ibrahim (1997) used
- crude honey,
- honey after heating at
- 56 ^{o}C for 30 min.,
- at 100 ^{o}C for 60 min.,
- at 121 ^{o}C for 20 min.

Veterinary Apitherapy in Egypt

3- Application

* - Surgery

- El Fikky and Ibrahim (1997) used
- honey dilutions 1,2,4,8,10,20,30,40,50,60 and 70 %.
- Also honey was tested in vivo on mice and infected skin incisions.

3- Application

* - Surgery

- Honey used in mice clean or infected closed incisions showed
- little inflammatory signs
- where it become sterile and healed rapidly.
-

3- Application

* - Surgery

- Infected open incisions dressed with honey become sterile within 5 days,
- healing after 7 days with clean hidden scare.

Veterinary Apitherapy in Egypt

3- Application

* - Surgery

- While infected incisions dressed with saline were contaminated with fungi and healed later with ugly scar.









Apitherapy Treatment Plan

Basic Treatment

Application of Mixture of 75% Honey + 25% Proprietary Solution of Whole Propolis in Water Covered by Dressing.

Clean Wounds and Reapply Every 5 – 7 Days.

Daily oral dosage of Honey & Propolis.



The heavy propolis percentage 'mummified' the necrotic tissues, allowing longer periods between re-applications.



The Dressing Was Changed 2 Days After 1st Treatment.



"Thet think it actually looked a little better …the tightness [edema] wasn't so firm and there was some oozing from the open wounds, which I took to be good."

- *Ina A.*



Back



Dressing again removed on 4th day of treatment due to "putrid" smell. Sutured wound on left hip had broken open and was draining. This was regarded as positive.



Neck/Shoulder



Hip

9/13/06








~ 2 Weeks Into Treatment.
Dead tissue is lifted to be trimmed as new skin develops.


Danett
September 12, 2006


Danett
September 24, 2006


Danett
October 4, 2006
34 Days of Treatment
Deeply injured tissue on shoulder and hip still not closed but appear as healthy wounds.


Danett
October 4, 2006

October 14, 2006

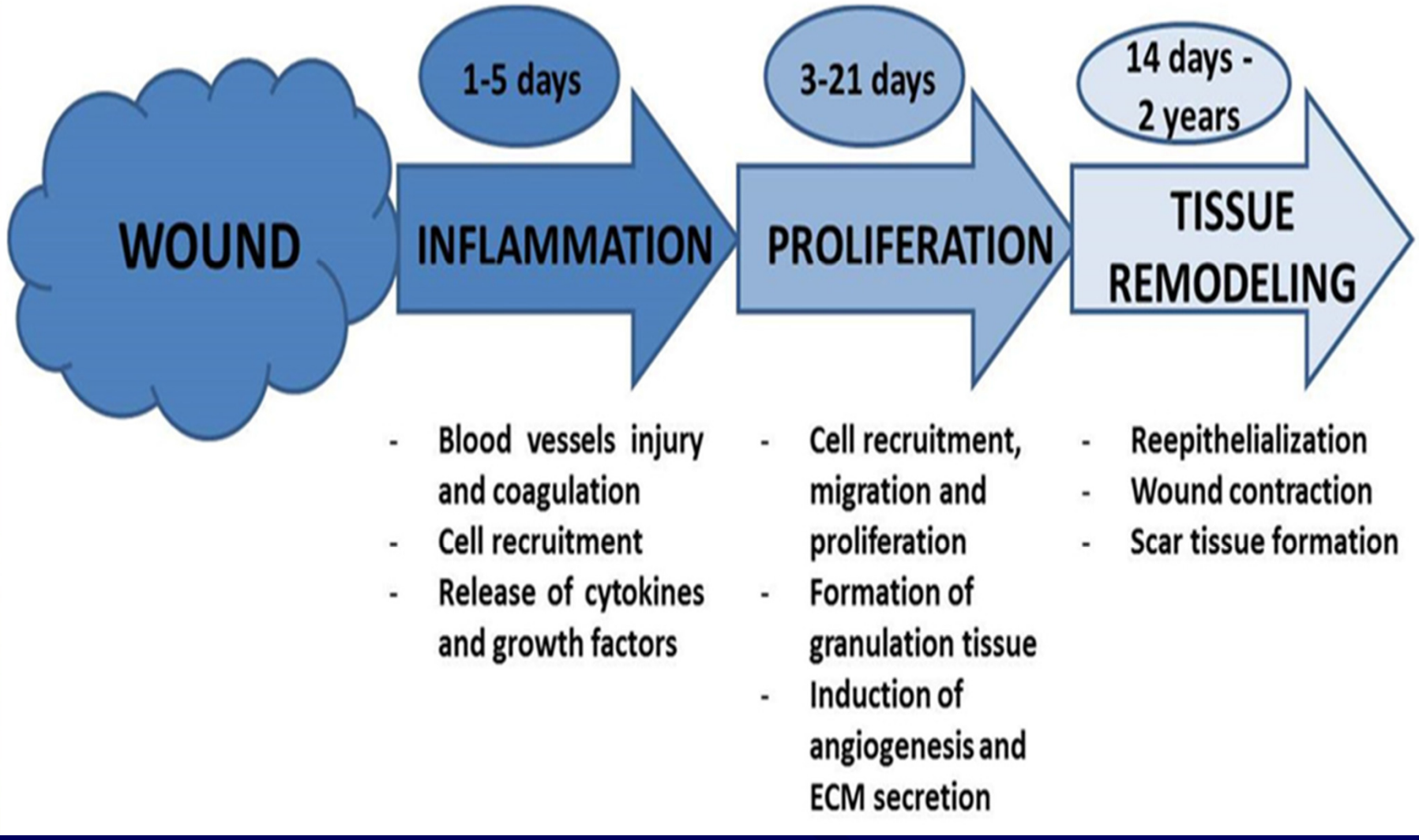
Final closure of deepest wounds almost accomplished.

Conclusions

Honey and propolis were easy to work with and accomplished treatment goals most effectively.




Danett
April 24, 2007
Epilogue
The healing was complete.
Hair regrew in some areas.


WOUND
1-5 days
INFLAMMATION
3-21 days
PROLIFERATION
14 days - 2 years
TISSUE REMODELING
- Blood vessels injury and coagulation
- Cell recruitment
- Release of cytokines and growth factors
- Cell recruitment, migration and proliferation
- Formation of granulation tissue
- Induction of angiogenesis and ECM secretion
- Reepithelialization
- Wound contraction
- Scar tissue formation

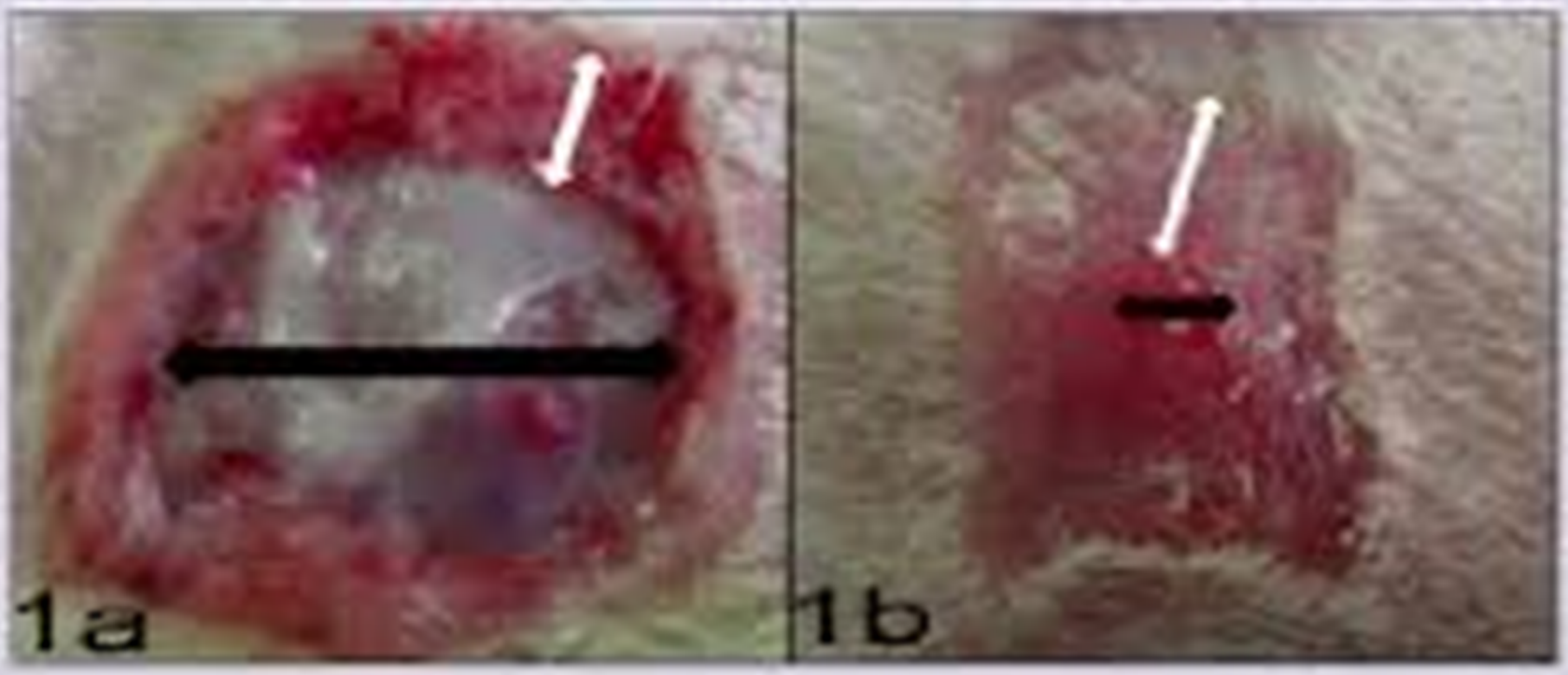


Figure 1. The area within the margin of the advancing epithelium (white arrow) was defined as the "unhealed wound area" (black arrow). A) Pure chestnut honey treatment group on day 7. B) Pure chestnut honey treatment group on day 14.

Happy Dog Owner Who Used Tube Of Medical Manuka Honey from us

(honey applied first 5 days until crust developed, min 2 hours per day)



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  - Ophthalmology

Apitherapy in Egyptian and Arabian countries

3- Application

* Dermatology

- Shoeib et al. (1997 a) was tested propolis against four genera of dermatophylic fungi :
- *Trich. Viulaceum*
- *T. schoenleinii*
- *M. canis*
- *Epid. Floccosum*

- They found an inhibitory effect of propolis was seen on 50 % of the tested fungi.

Apitherapy in Egyptian and Arabian countries

3- Application

* Dermatology

Shoeib et al. (1997 b) was tested propolis against 32 different bacterial strains isolated from skin lesions These lesions were including :

impetigo

wound infection

carbuncles.

* They found an inhibitory effect of propolis was 62 % of the tested bacteria

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Apitherapy in Egyptian and Arabian countries

3- Application

* - Pharmacology

- Biological and pharmacological studies on honey have been under taken (El Kassaby, 1997).

3- Application

* - Pharmacology

- It is evidently shown from the results obtained that honey possesses some medicinal activities as
- its effect on male and female rats, which cause increase in body weight.

3- Application

* - Pharmacology

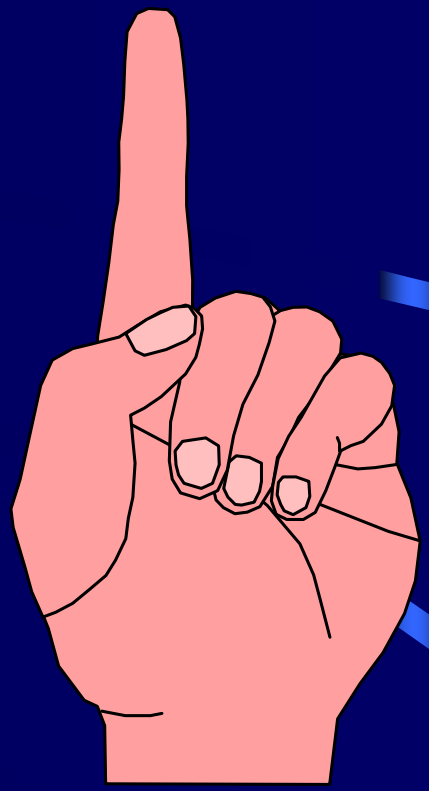
- It also shows on female an estrogenic activity resembling oestradiol and produced increase in uterine weight
- While on male showed androgenic effect as increases in the seminal vesicles and testicle weight.

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INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING EHRLICH CARCENOMA

- A total of 210 mice with an average weight 22-25 gm each.
- These mice were divided into 6 equal groups; each group included 35 mice as follows:



INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING EHRLICH CARCENOMA

Group	Saline	Propolis	Ehrlich carcinoma	
			Ascites	Solid
1	+	-	-	-
2	-	+	-	-
3	-	-	+	-
4	-	-	-	+
5	-	+	+	-
6	-	+	-	+

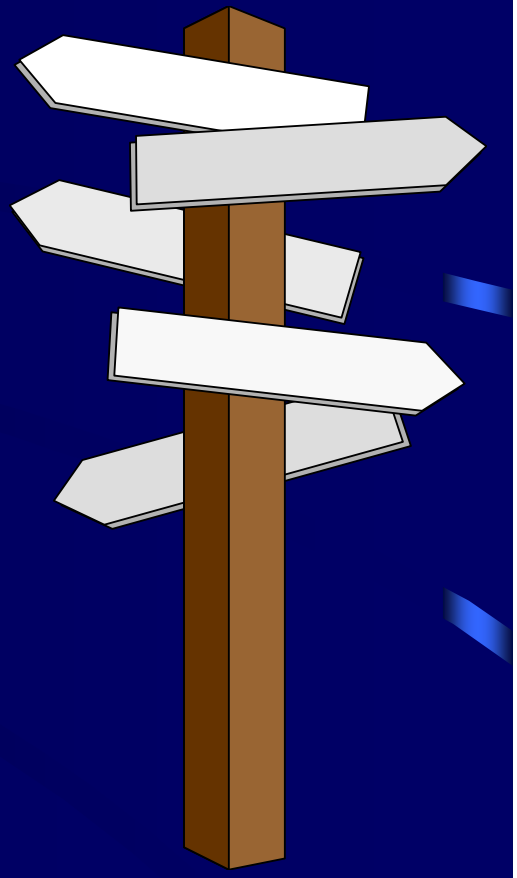
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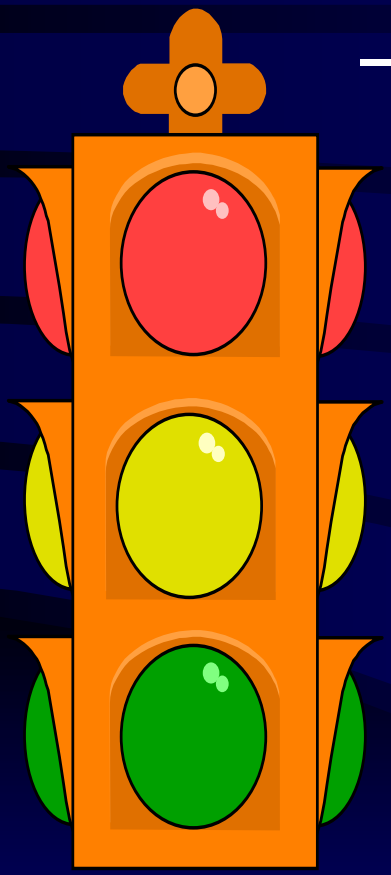
- Blood samples were subjected to determine lymphocyte transformation as Hegazi et al. (1981) & (1985)
- phagocytic activity as Hegazi et al. (1995).
- While the sera sample were used for the detection of different Immunoglobulin levels IgG, IgA and IgM (Deverill, 1978).

INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING EHRLICH CARCENOMA

- At 72 hours before the end of the experiment a 0.1-ml of bovine serum albumin was inoculated in the left footpad of the mice where the right foot pad was inoculated with saline.



INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING EHRLICH CARCENOMA



– Skin thickness was measured, 24 hours and 72 hours post inoculation to evaluate the delayed type hypersensitivity as Cheville and Beard (1972); Hegazi (1981) and Hegazi et al. (1985).

INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING EHRLICH CARCENOMA

Results



INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING EHRLICH CARCENOMA



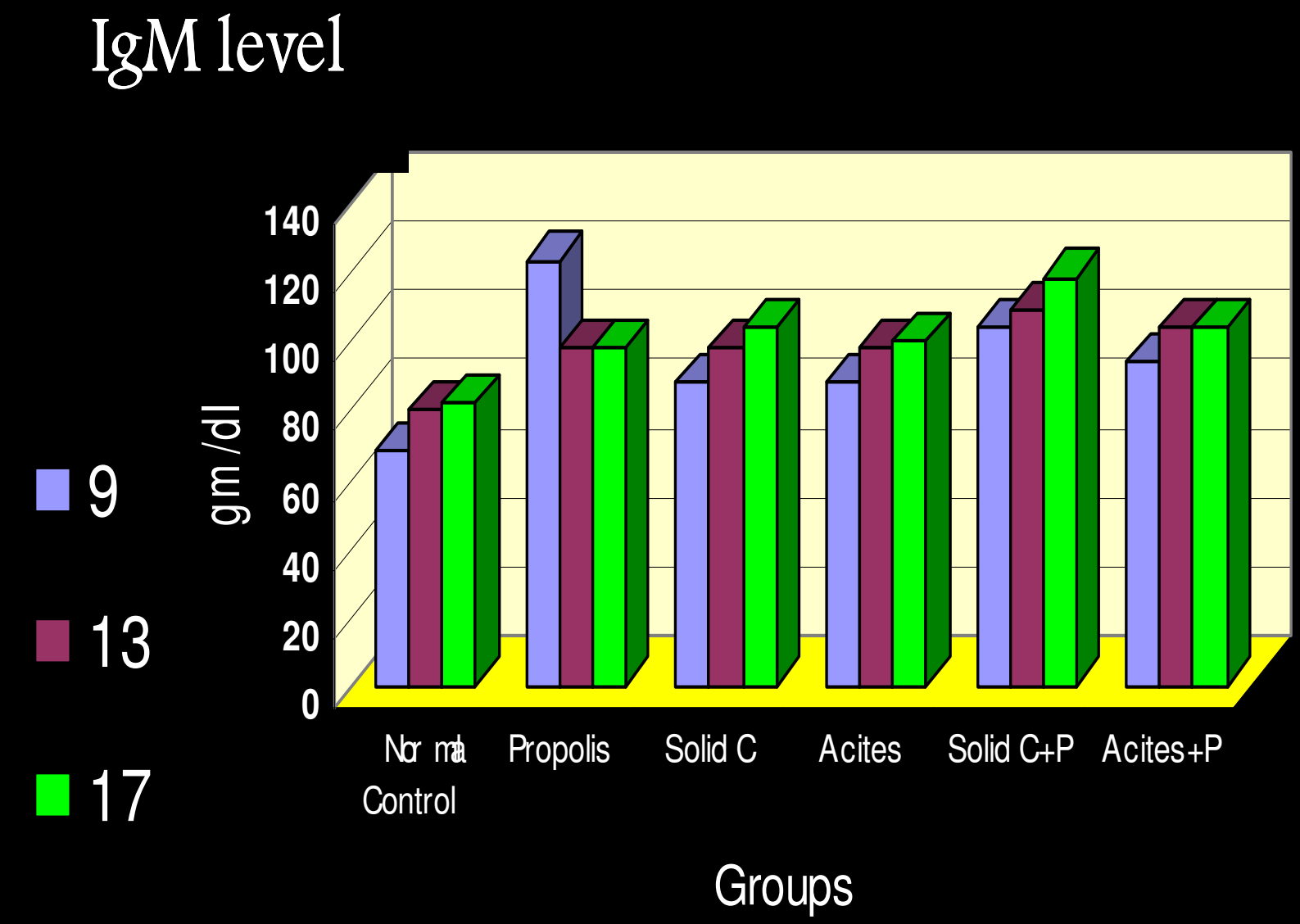
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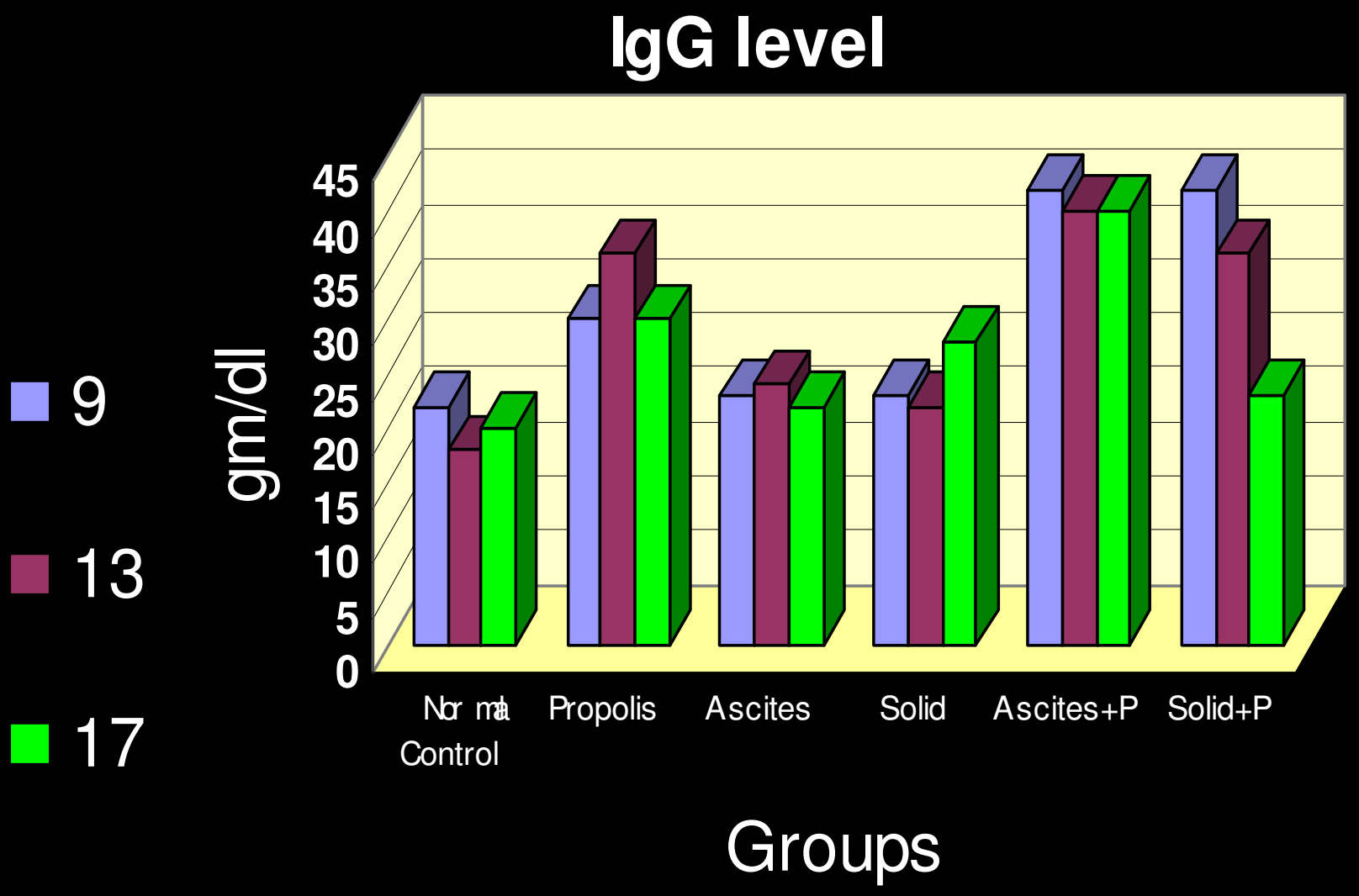
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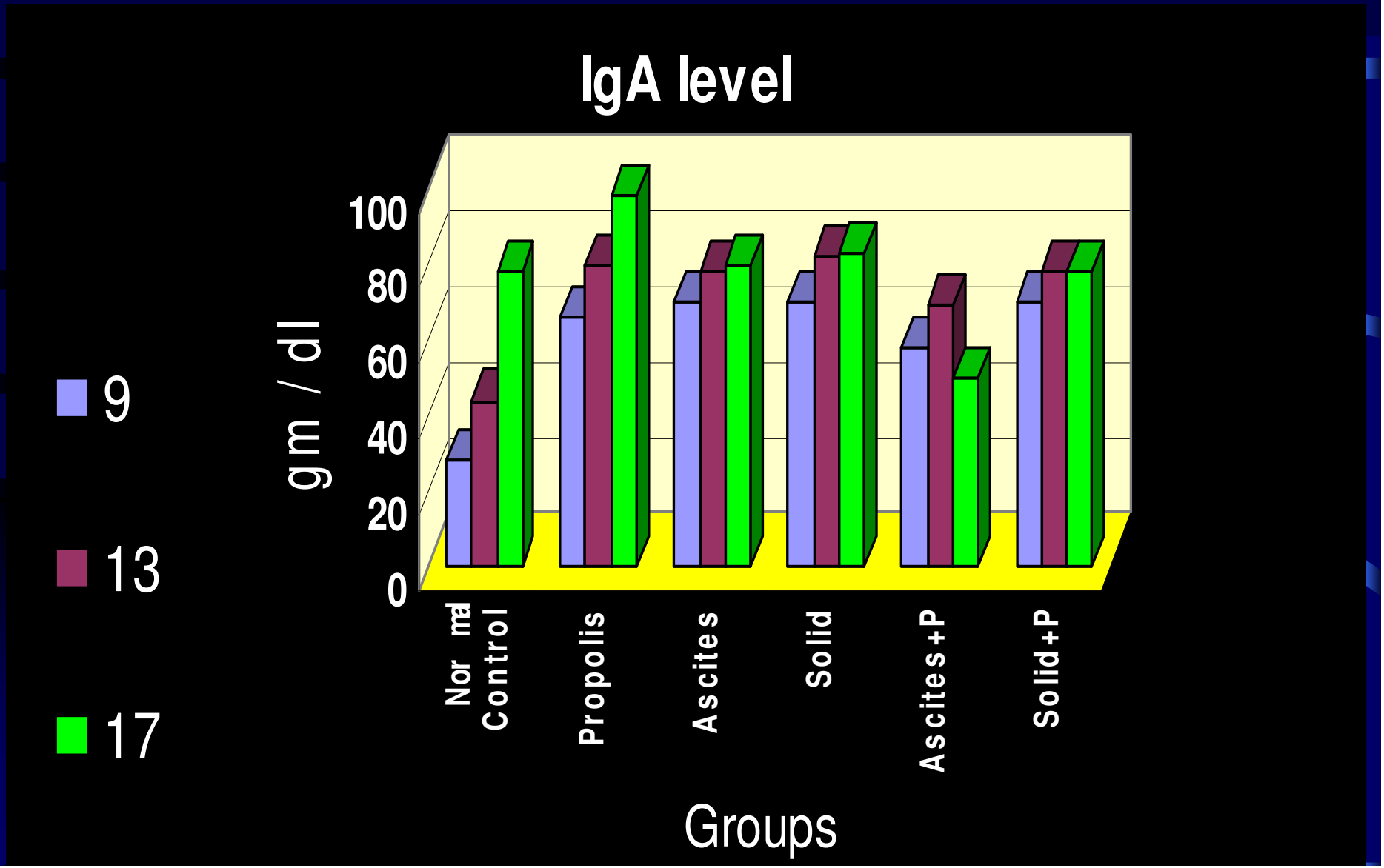
INFLUENCE OF EGYPTIAN PROPOLIS ON IMMUNE STATUS OF MICE BEARING



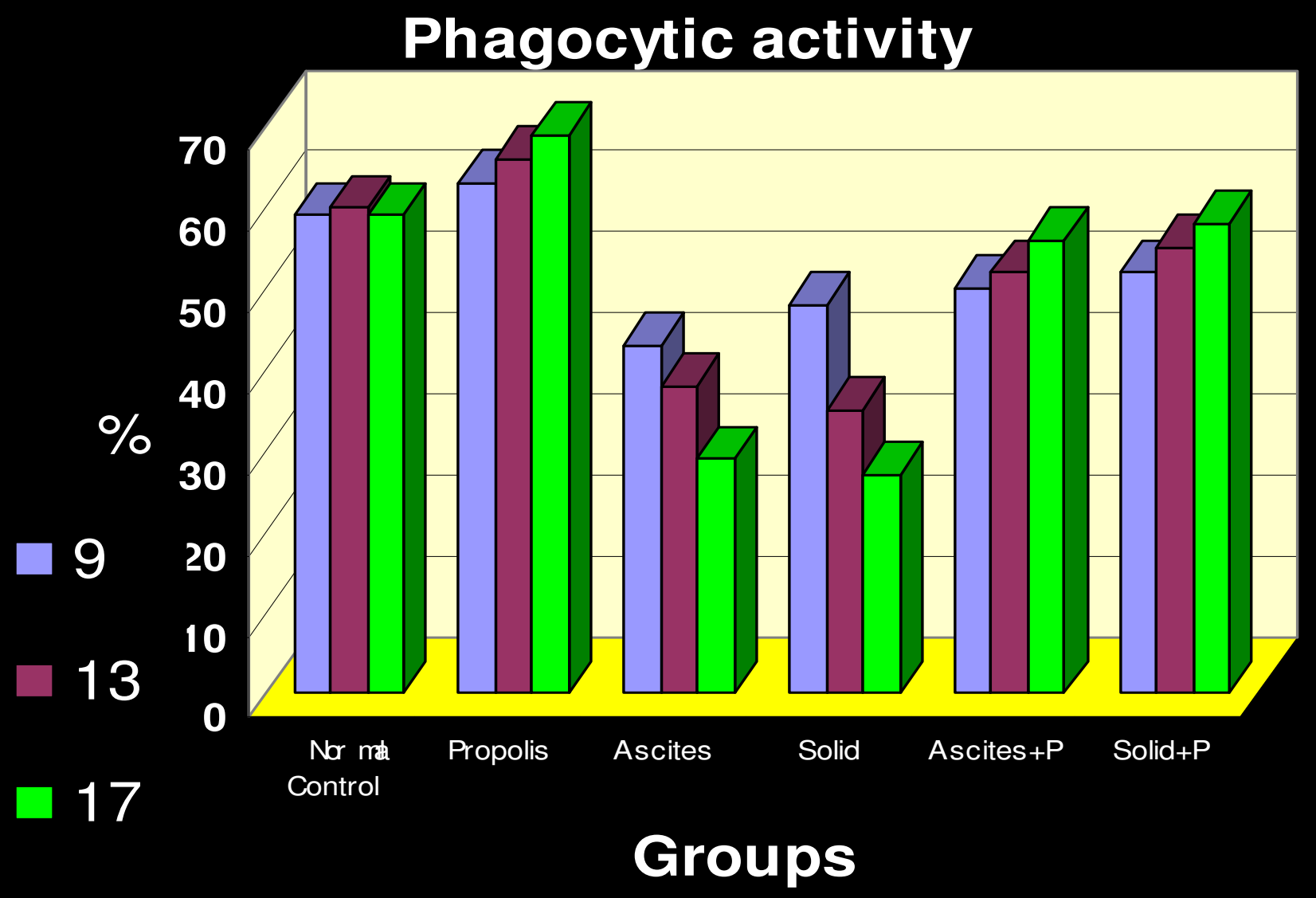
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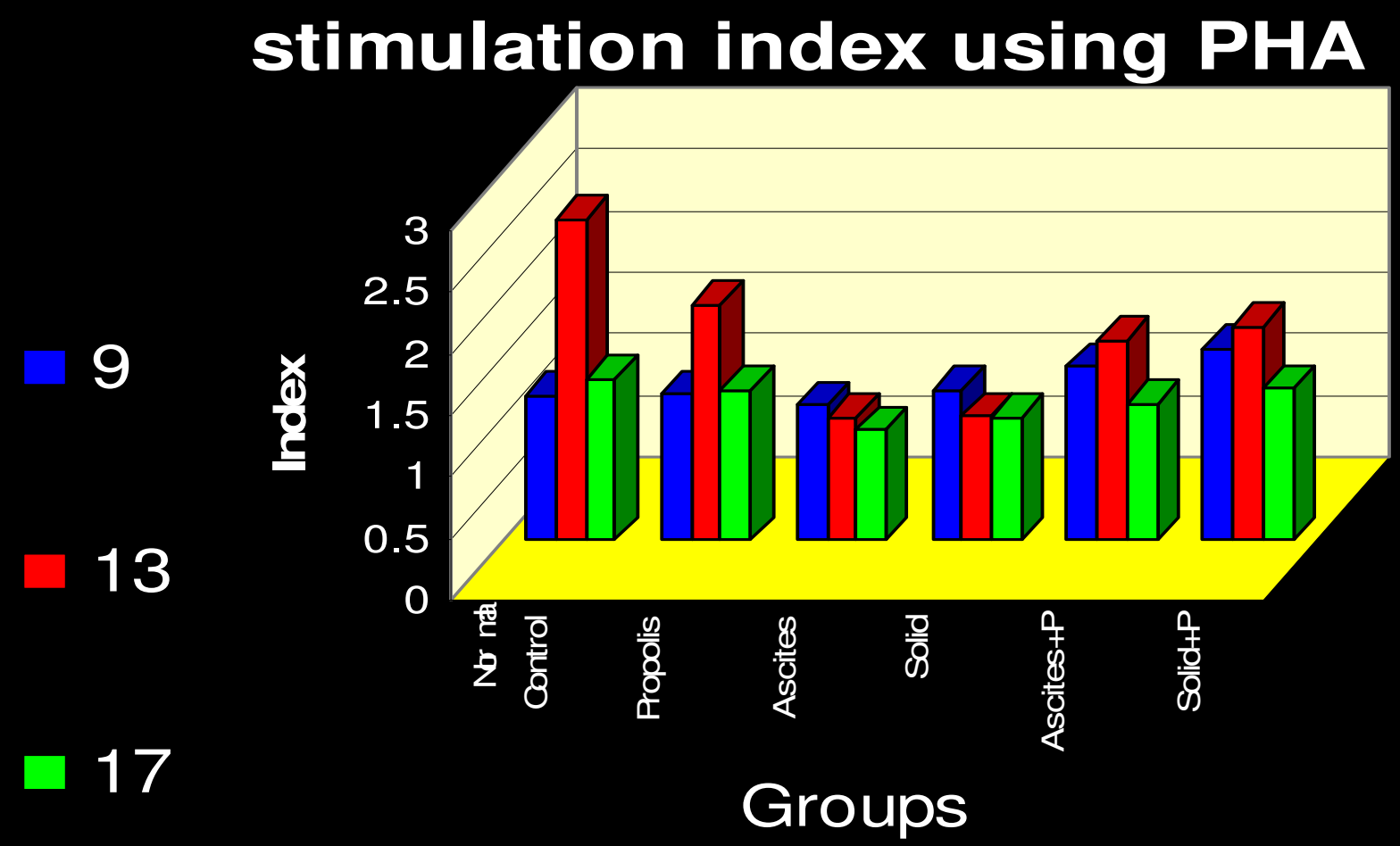
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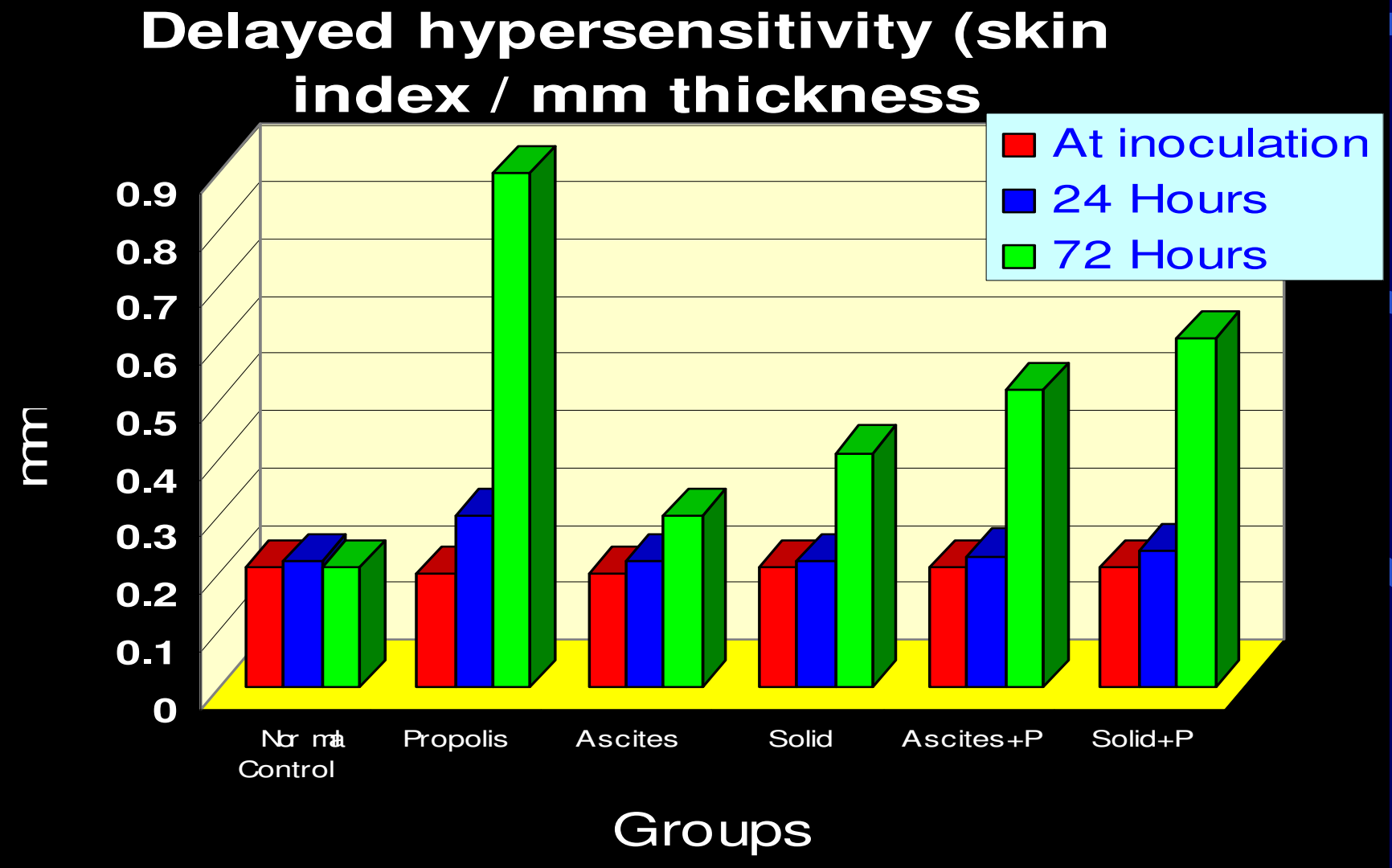
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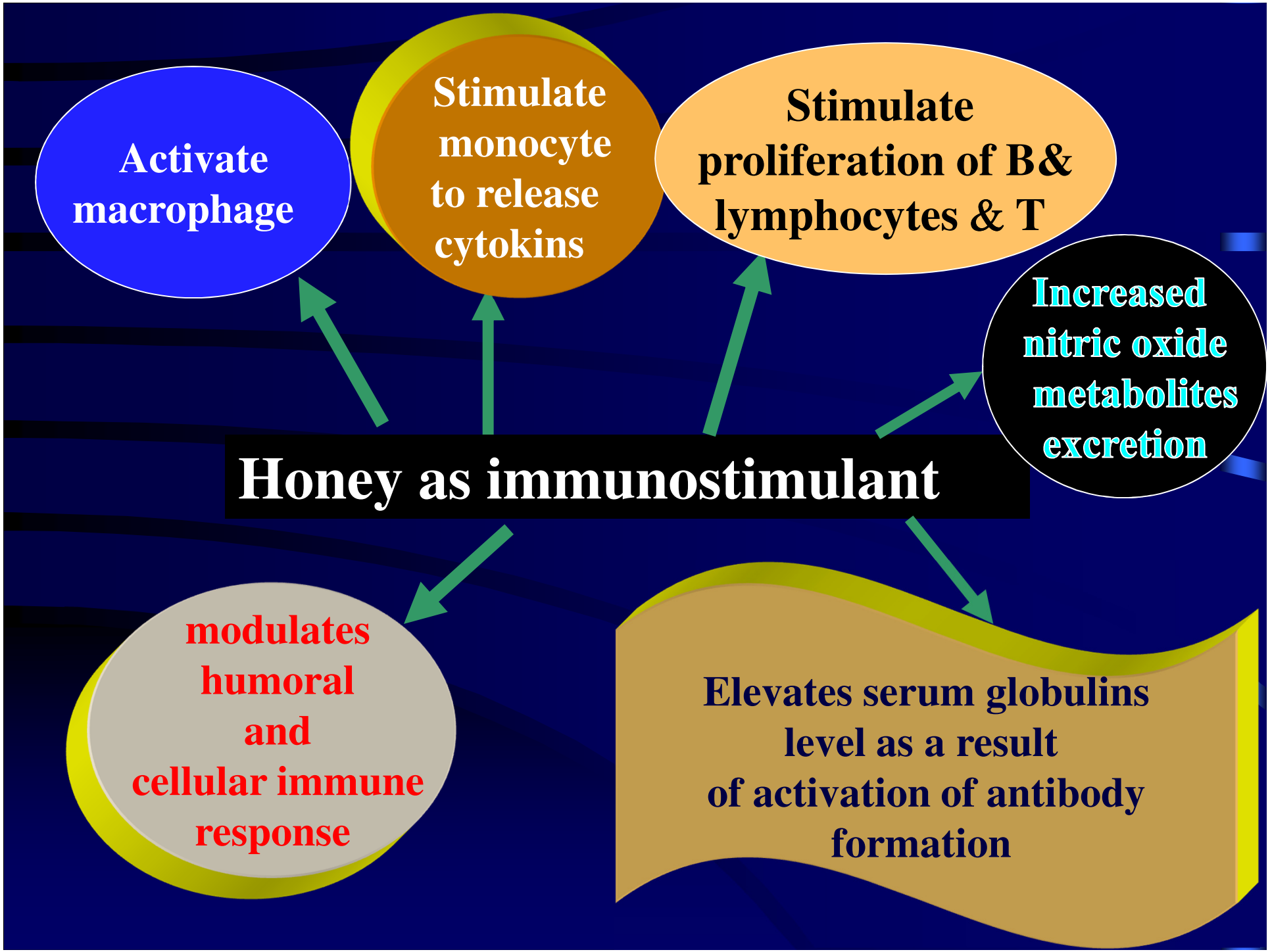


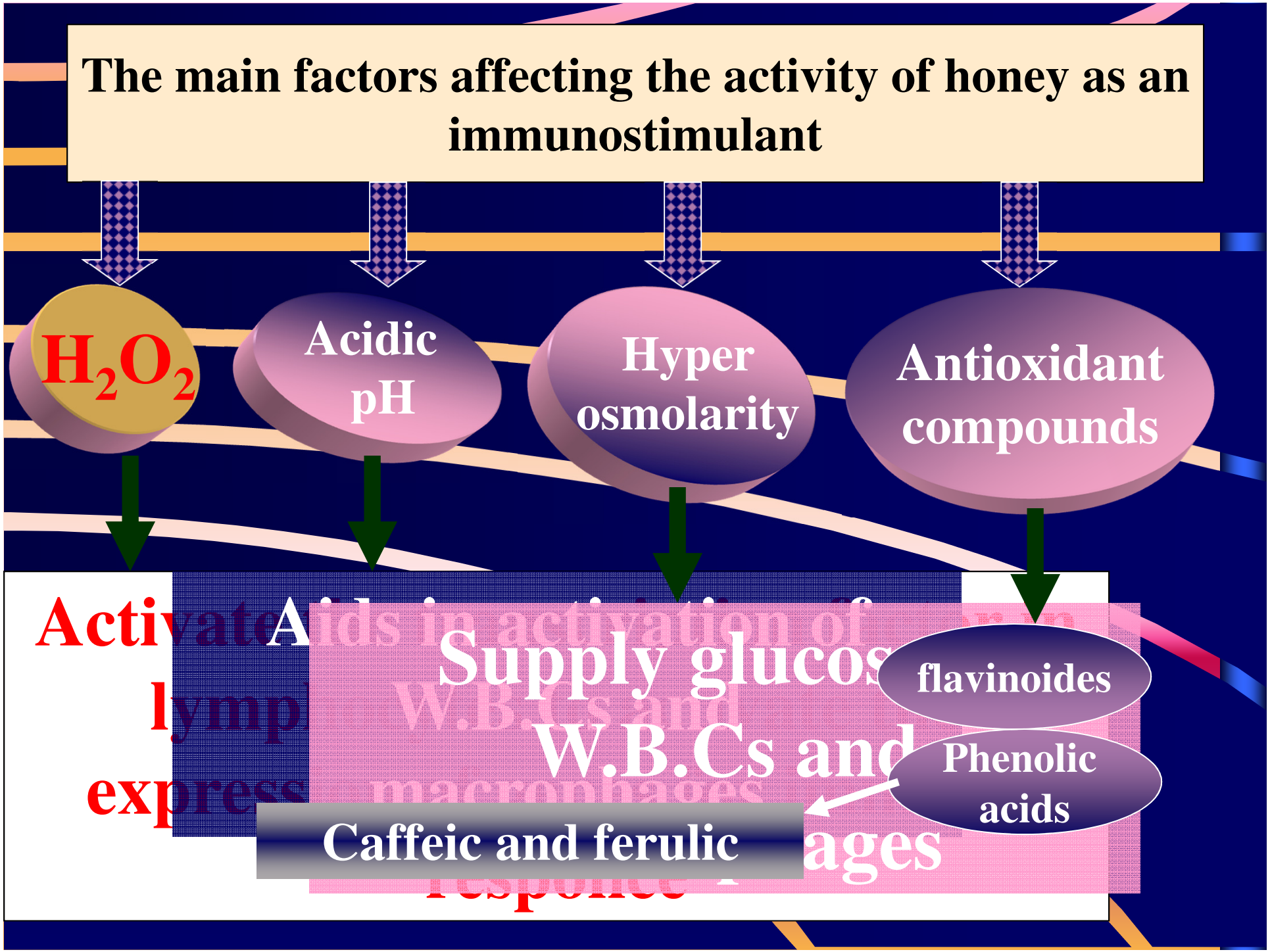
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Activate macrophage
Stimulate monocyte to release cytokins
Stimulate proliferation of B& lymphocytes & T
Increased nitric oxide metabolites excretion
Honey as immunostimulant
modulates humoral and cellular immune response
Elevates serum globulins level as a result of activation of antibody formation


The main factors affecting the activity of honey as an immunostimulant
H_2O_2
Acidic pH
Hyper osmolarity
Antioxidant compounds
Activate
lymph
express
Aids in activation of
W.B.Cs and
macrophages
Supply glucos
W.B.Cs and
ages
flavinoides
Phenolic acids
Caffeic and ferulic

Propolis as immunostimulant

activate immune cells (monocytes) to produce cytokines

Has direct effect on Immuno regulatory T cells

Act on host non specific immunity activating macrophage (A macrophage activation phenomenon)

Active biological components in propolis



180-300 different biological compounds have been identified in propolis extract including

- **Amino acids**
- **Flavonoids**
- **Phenolic acids**
- **Terpenes and Cinnamic acid derivatives**

The major and the most active compounds

Flavonoids of honey and propolis

- Kill many bacterial strains
- Inhibit important viral enzymes
- Destroy some pathogenic protozoa

Stimulate some hormones and neurotransmittors

Scavenge free radicals → Antioxidant

Have antitumor activities



Bee venom

Contains more than 40 active substances (many of which have yet to be studied)

Average amount of venom in a single sting was 100 µg

Contain melittin and phospholipases A_2 which have antiinflammatroy and anticancer activities

Immunology



- The effect of Egyptian propolis on chicken body weight and lymphoid organs revealed an increase in body weight after one week post injection and increase thymus weight after 14 days post injection up to the end of the experiment.

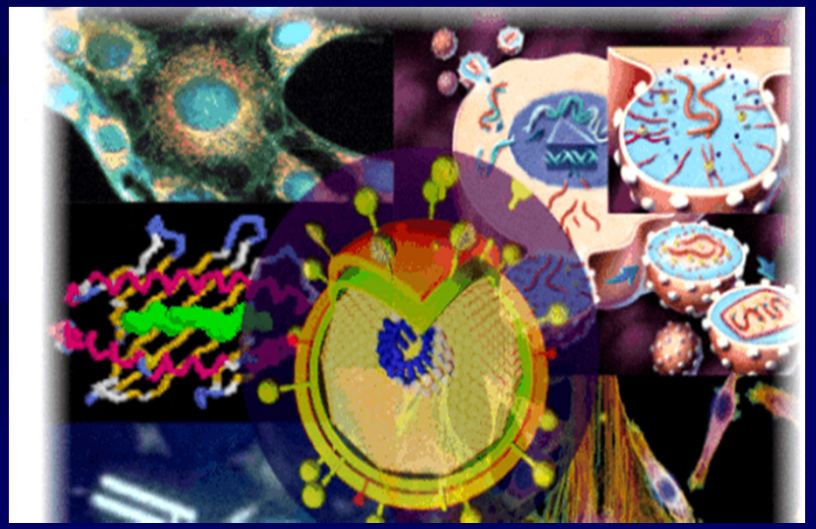
Immunology

- spleen weight slightly affected, but bursa and caecal tonsil weights were increased at the last two weeks of the experiment.



Immunology

- The highest phagocytic activity was at 14 days post injection with propolis (65% vs. 59%).



Immunology



- There was increase in the stimulation index of the peripheral lymphocytes as detected by lymphocyte transformation in case of propolis group (2.61 vs 1.92 and 1.31 vs 22% at 7th and 28th days post injection).

Immunology

- The delayed hypersensitivity skin test using propolis as sensitizing antigen showed specific stimulation to propolis after 72 hours after inoculation with specific antigen.

Immunology

- Egyptian propolis gave the typical delayed hypersensitivity when inoculated to the sensitized chickens.



Immunology

- The thickness index was 0.90 mm if compared with nonsensitized control group 0.12 mm (Hegazi *et al.*, 1996).



Immunology



- Honey and propolis as management of chronic skin ulcers were used by Tossoun et al (1997).

Tissue samples

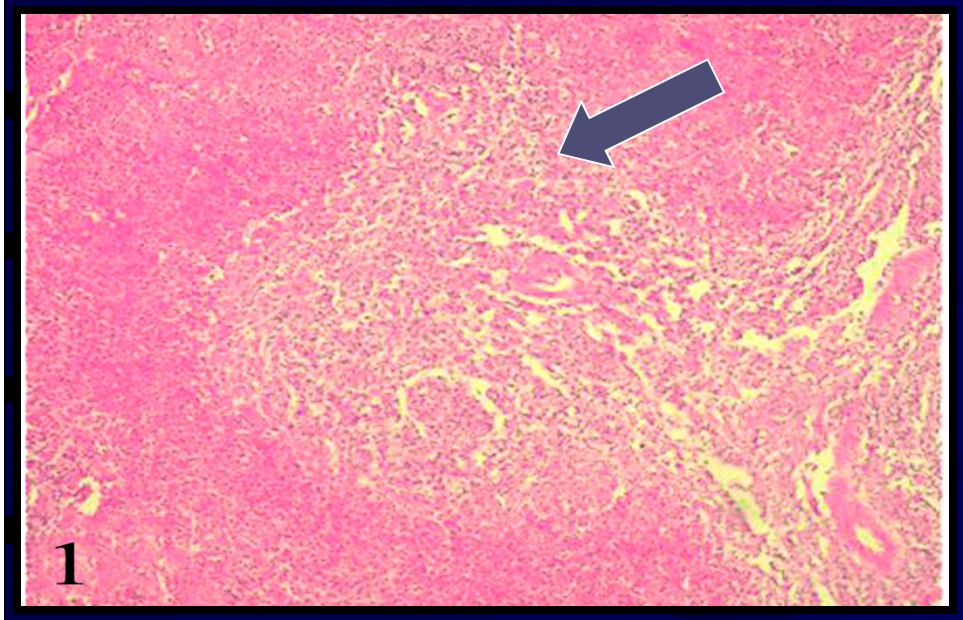
Were obtained from each groups (5 rats each) including

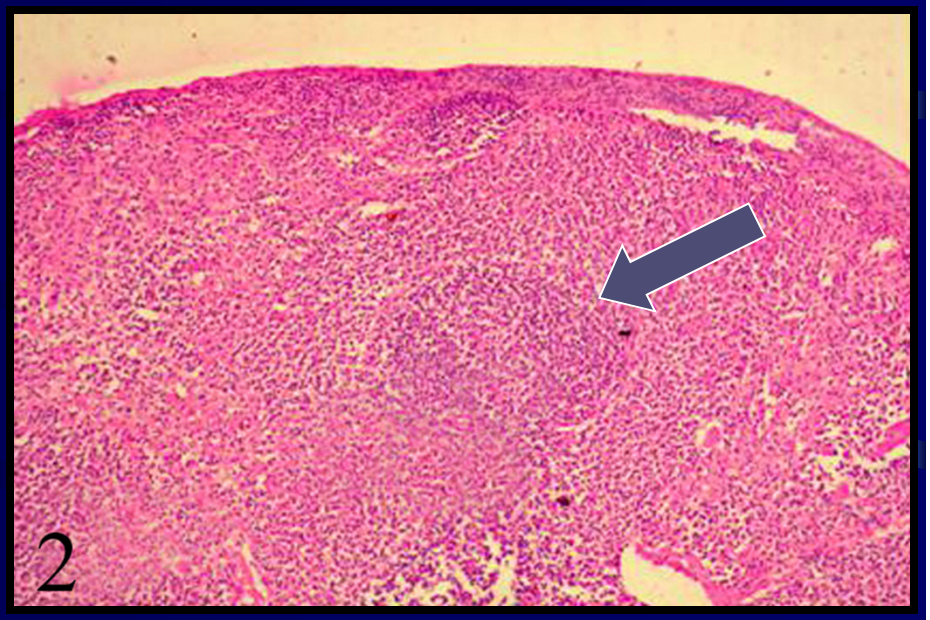
- Spleen
- Lymph nodes
- Peyer's patches

Samples were prepared for pathological and immuno-histochemical study using

- Haematoxylin and Eosin stain (H&E)
- Alkaline Phosphatase stain
- Non Specific esterase stain

Spleen stained with H&E





control

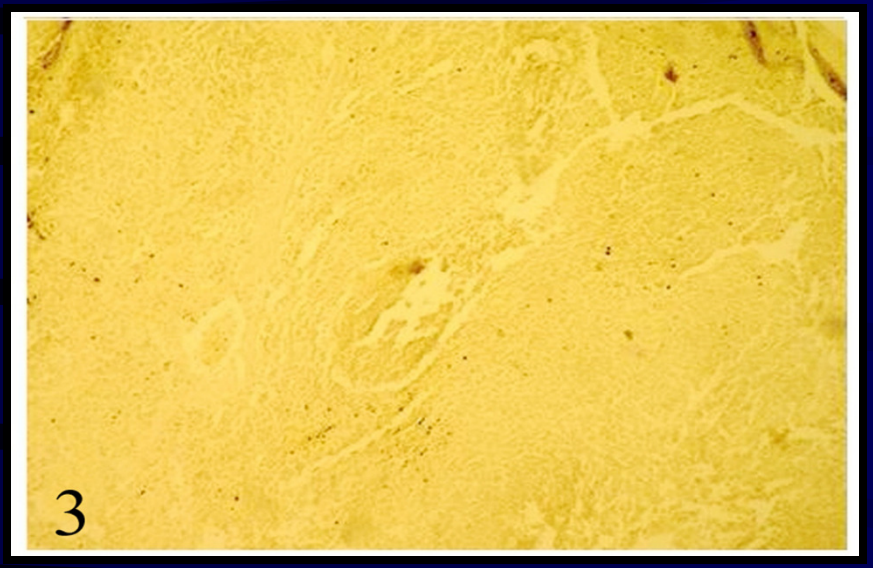
honey orally
and I/P injection

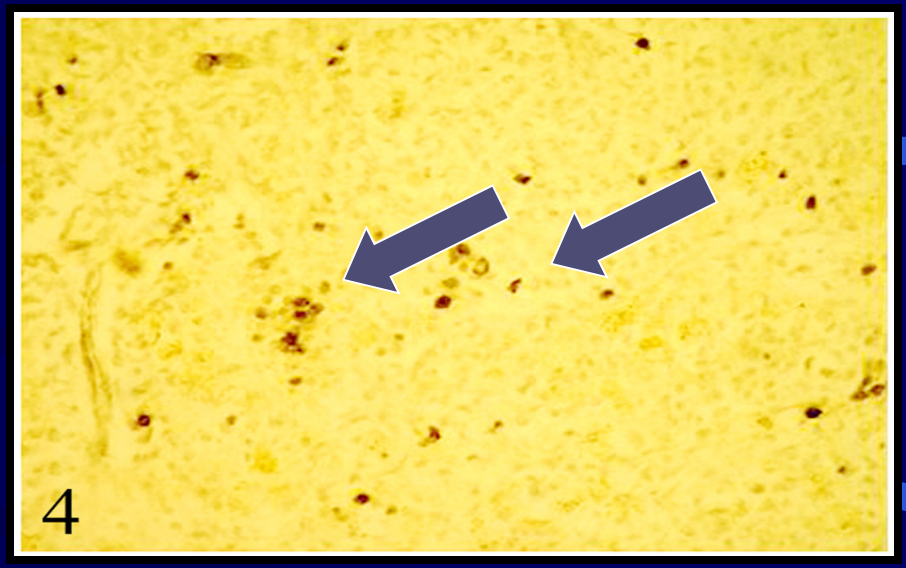
lymphocytic density of the white pulp

low

High

Spleen stained with non-specific estrase





control

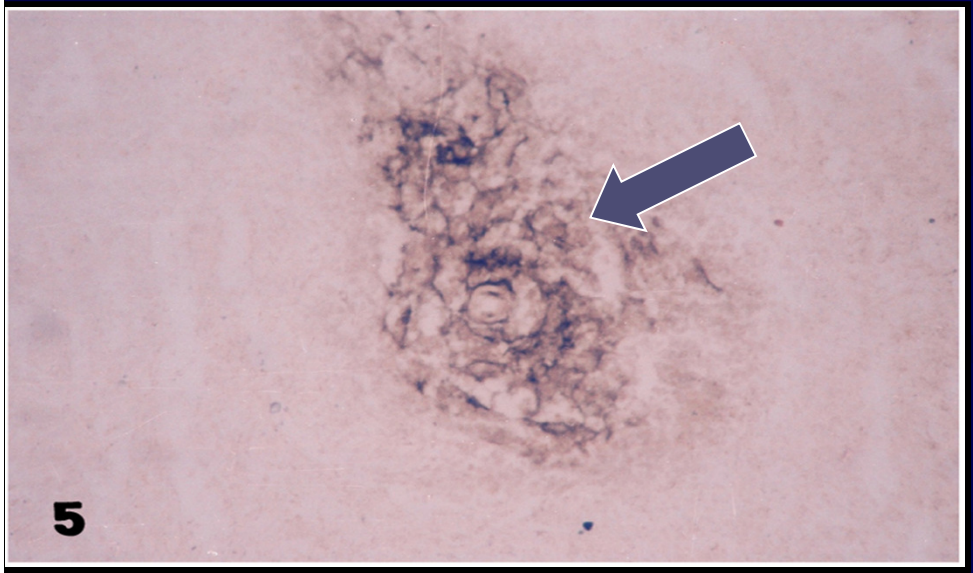
honey orally and I/P injection

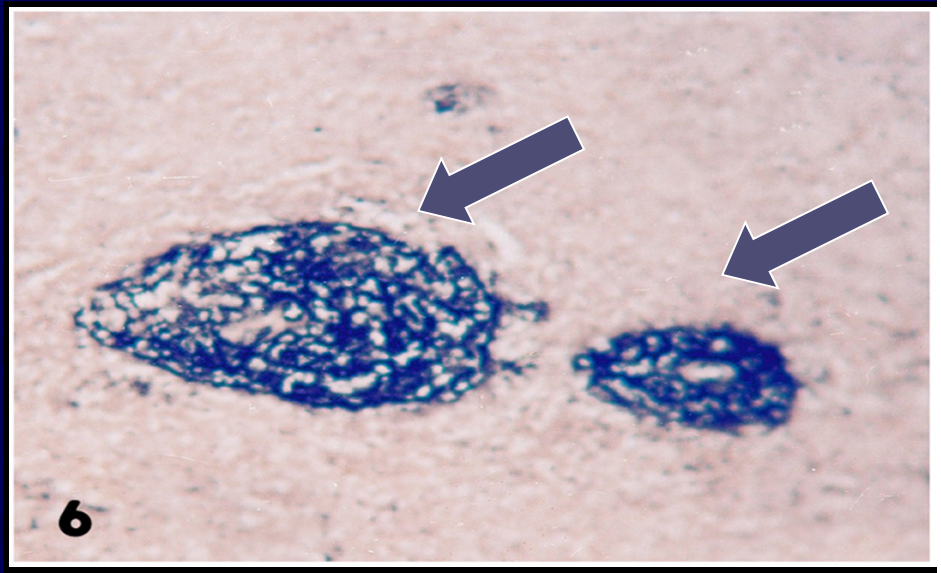
macrophagal reaction

weak

strong

Spleen stained with alkaline phosphatase



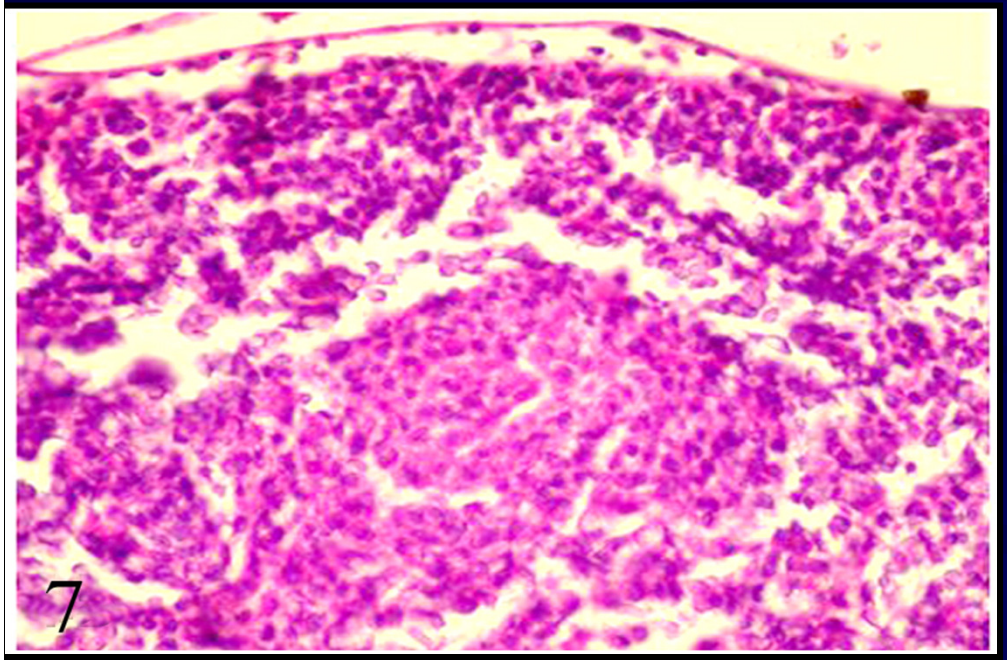


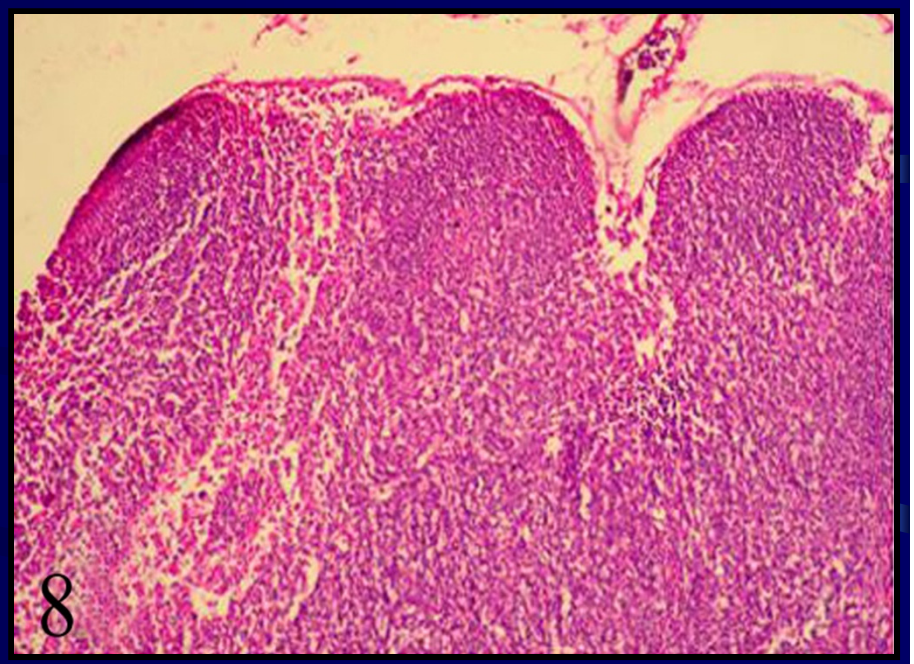
control **Apipunctured rat**

B cell reaction in the white pulp around the splenic artery

moderate ***strong***

Lymph node stained with H&E



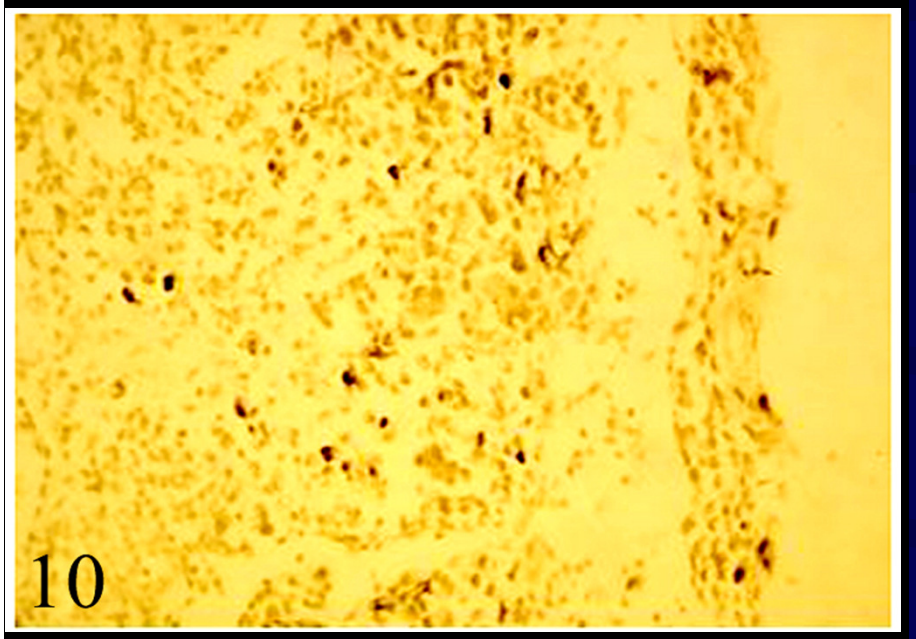


control **honey orally**

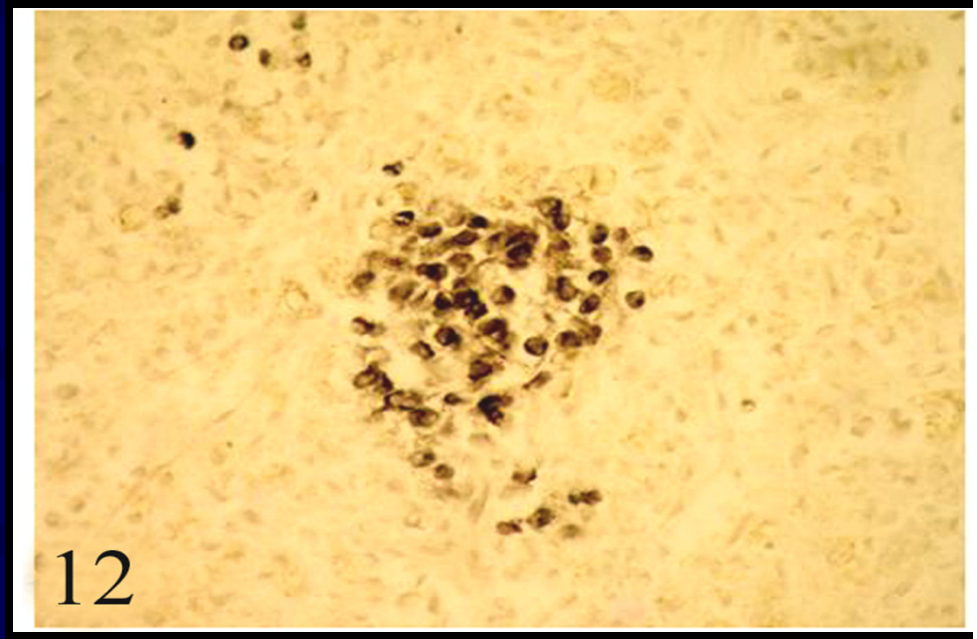
lymphocytic density in the lymphoid follicles

low ***high***

Lymph node stained with nonspecific esterase



control



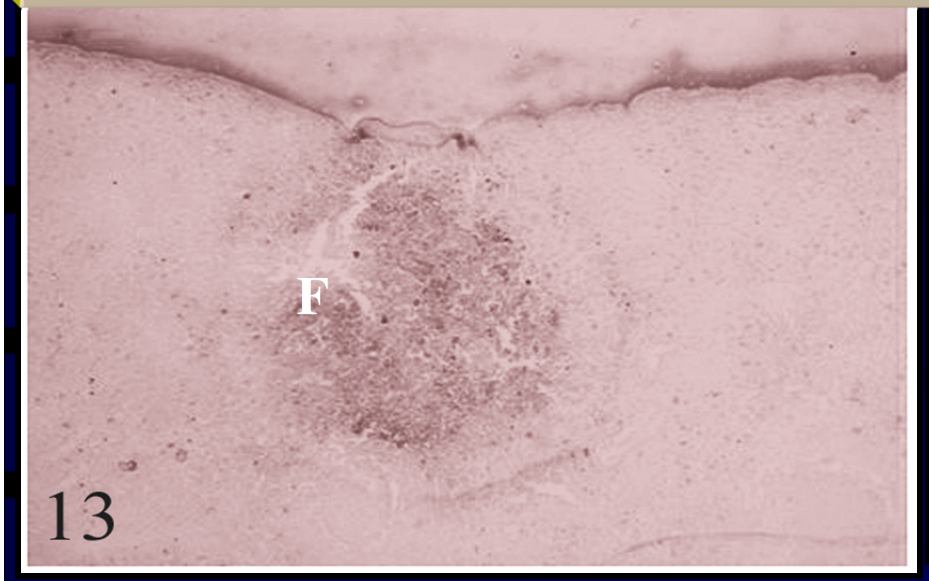
honey and EEP I/P

macrophagal reaction

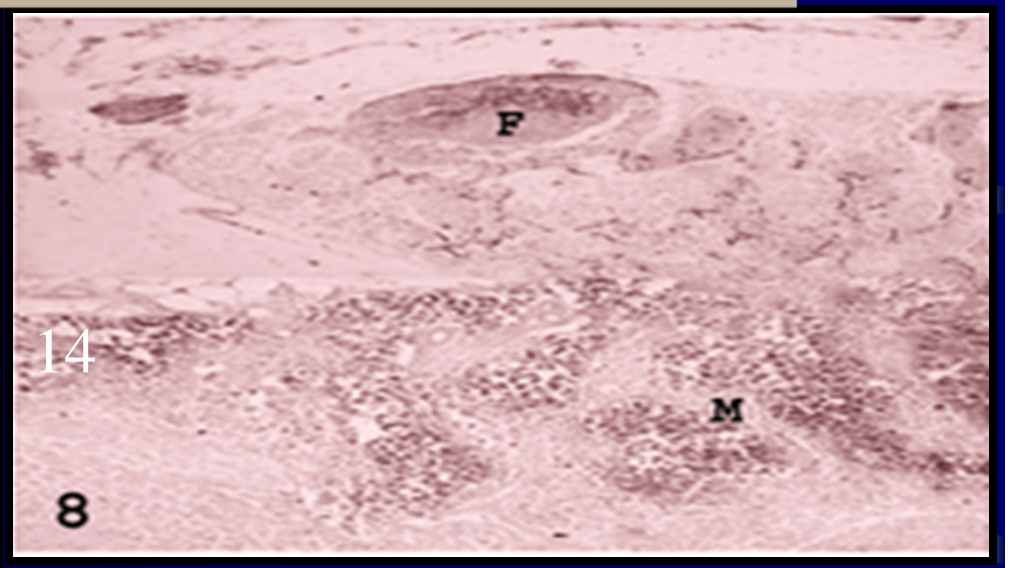
weak

strong

Lymph nodes stained with alkaline phosphatase



control



honey I/P, Apipunctured rats

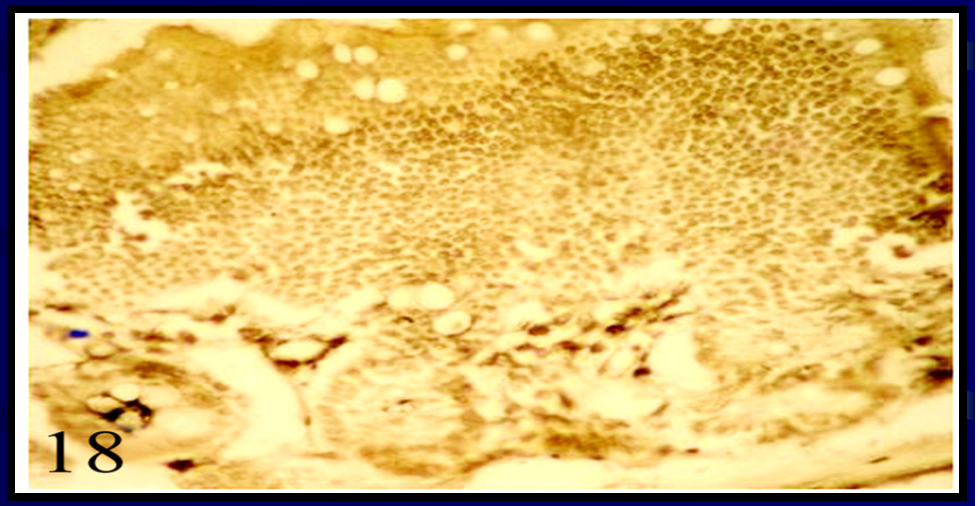
B lymphocytic reaction in the lymphoid follicle (F) and the medullary cords (M)

low ***high***

Peyer's patches stained with non specific esterase



control



honey orally

T lymphocytic reaction

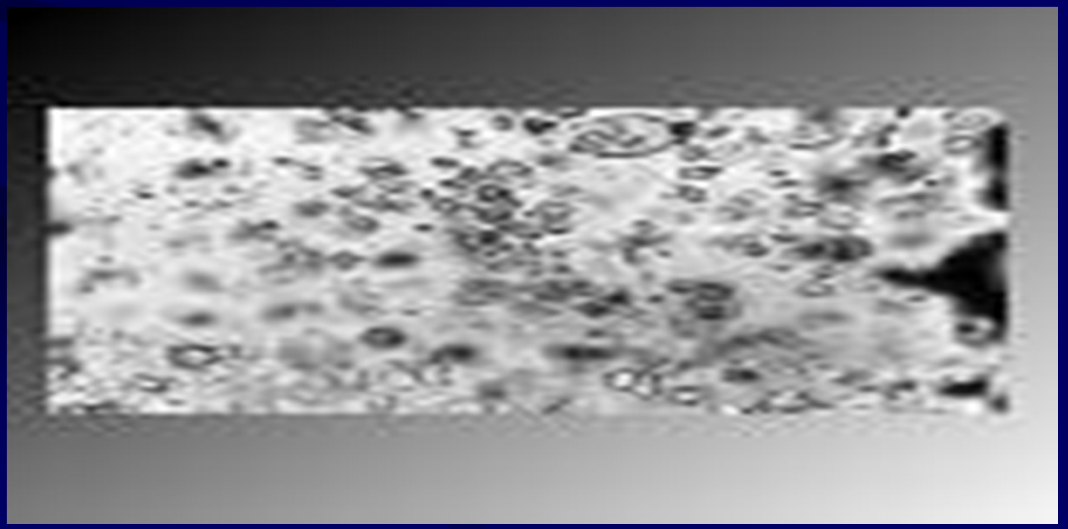
low ***strong***

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- 1-Introduction
- 2-History
- 3- Application
  - Surgery
  - Dermatology
  - Pharmacology
  - Anticancer
  - Immunology
  - Antiviral activity
  - Antibacterial activity
  - Antifungal activity
  - Antioxidant activity
  - Ophthalmology

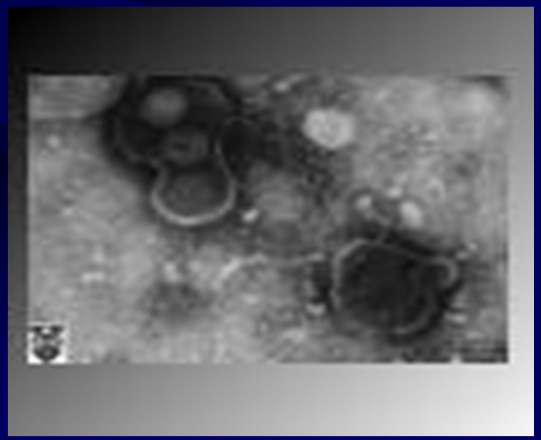
Antiviral activity

- Hegazi *et al*. (1993) studied the effect of propolis on different NDV vaccinated strains.



Antiviral activity

- They found that the addition of propolis to NDV induced a significant reduction of infectivity titters.
- The effect of propolis was pronounced in Lasota, clone 30 and virulent NDV.



Antiviral activity

- The HA titters of kamarov and virulent NDV were reduced significantly.
- They suggested that propolis has antiviral activity against NDV.

Antiviral activity

- Hegazi *et al.* (1995a) studied the effect of some bee products on immune response of chicken infected with virulent NDV.



Antiviral activity

- They found that, the mortality rate was reduced in-groups infected with virulent NDV and subsequently treated either with propolis or honey if compared with the infected groups only.



Antiviral activity



- It was clear that, propolis acts actively as antiviral agent than honey.
- The treatment with propolis and honey of NDV infected chicken groups induced increase in the antibody titters and phagocytic percentage.

Effect of propolis on body and lymphoid organ weight

Group times	B. W. p	B.W.c	t.W. p	B.W. c	B.Wp	B.W. c	Br. W.p	Br. W.c	c.t W.p.	c.t. W.c
0 days	39 ±3	39± 3	0.41	0.39	0.06	0.06	0.18	0.18	0.10	0.10
7 days	60 ± 4	53 ± 9	0.43	0.41	0.11	0.11	0.47	0.47	0.13	0.15
14 days	95 ± 8	96 ±11	0.77	0.56	0.25	0.24	0.86	0.84	0.17	0.19
21 days	146 ± 2	141 ± 5	0.78	0.30	0.54	0.47	1.68	1.67	0.24	0.32
28 days	512 ± 2	206 ±13	2.26	2.20	0.59	0.58	2.35	1.98	0.25	0.24
35 days	325 ± 5	322 ±21	3.64	3.38	0.79	0.77	2.35	1.98	0.35	0.30

Phagocytic Activity.

Groups	Propolis	Control
Time of examination	58	59
0 day	60	60
7 day	65	59
14 day	62	57
21 day	60	57
28 day	61	61
35 day	61	58.5

Antiviral activity

- The reaction was typical Arthus type. In propolis group inoculated with NDV antigen, the reaction was different and the lymphocytes appeared to play the main role in this reaction which became a delayed type of hypersensitivity.

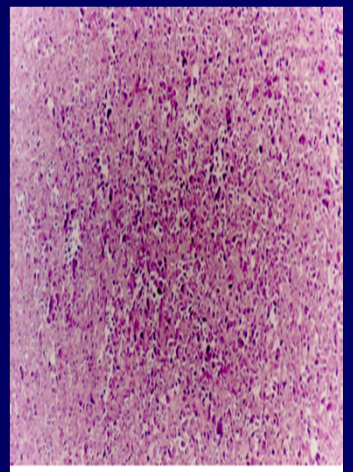


Fig 3

Lymphocyte Transformation (Stimulation Index Using PHA).

Groups	Propolis	Control
Time of examination	1.18	1.19
0 day	2.61	1.92
7 day	1.31	1.22

Delayed hypersensitivity (skin index / mm thickness)

Groups	Propolis	Propolis	Control	Control
Time of examination	Propolis	Saline	Propolis	Saline
At inoculation	0.20	0.20	0.21	0.21
24 day	0.23	0.22	0.22	0.32
72 day	0.90	0.10	0.21	0.21

Mortality rates among chicken inoculated with virulent NDV or treated with honey bee products:

No.	Group	No.of chickens	NDV	Treatment		Death/ Total	Life/ Total	Mortality %
				Propolis	honey			
I	NDV	25	+	-	-	20/25	5/25	80.0
II	NDV+	25	+	+	-	8/25	17/25	32.0
III	Propolis	25	+	-	+	15/25	10/25	60.0
IV	NDV + honey	25	-	+	-	3/25	22/25	12.0
V	Propolis	25	-	-	+	4/25	21/25	16.5
VI	Honey	25	-	-			22/25	12.0

Antibody titer and phagocytic percentages among chicken infected with virulent NDV and subsequently treated with honeybee products.

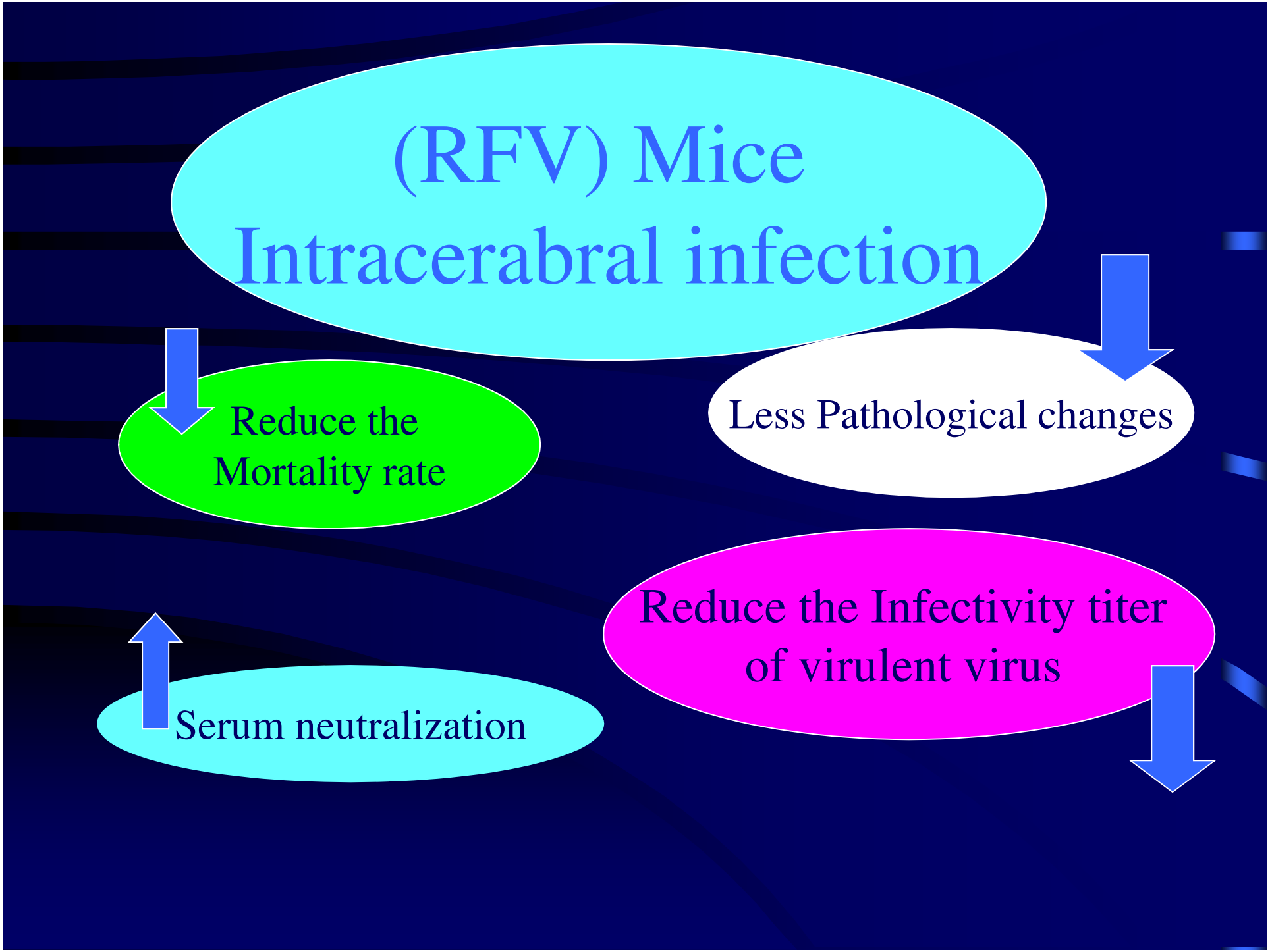
No.	Group	No.of chickens	NDV	Treatment		NDV H1 Antibody titer 21 days post infection	phagocytic %21 days post infection
				propolis	honey		
I	NDV	25	+	-	-	1/2048	18 ±2.1
II	NDV+	25	+	+	-	1/4096	42 ±3.2
III	Propolis	25	+	-	+	1/4096	34 ±2.8
IV	NDV +	25	-	+	-	1/16	61 ±3.2
V	honey	25	-	-	+	1/16	54 ±2.0
VI	Propolis	25	-	-	-	1/16	51 ±1.1

Skin test using different sensitizing agents.

No.	Group	Skin indices after 72 hr. post Sensitization with different specific antigens		
		NDV	Propolis	Honey
I	NDV	2.90 ±0.10	0.40 ±0.02	0.40 ±0.05
II	NDV +Propolis	3.21 ±0.20	1.50 ±0.11	0.70 ±0.123
III	NDV + honey	2.75 ±0.11	0.23 ±0.01	0.90 ±0.12
IV	Propolis	0.33 ±0.01	1.70 ±0.13	0.56 ±0.10
V	Honey	0.26 ±0.04	0.33 ±0.01	0.83 ±0.11
VI	Control	0.33 ±0.03	0.16 ±0.01	0.30 ±0.02

Antiviral activity

- Hegazi et al., (1997)studied the influence of honey and aqueous extract of propolis on Interacerbrial infection of baby mice with Rift valley fever virus (10^{6} ILD_{50} /IC/ ml) was done to evaluate the antiviral activity.


(RFV) Mice
Intracerabral infection
Reduce the
Mortality rate
Less Pathological changes
Reduce the Infectivity titer
of virulent virus
Serum neutralization

Antiviral activity

- The results revealed that the aqueous extract of propolis and honey reduced the morbidity and mortality rates as well as decrease the infectivity mean titer of infected baby mice with RVFV.

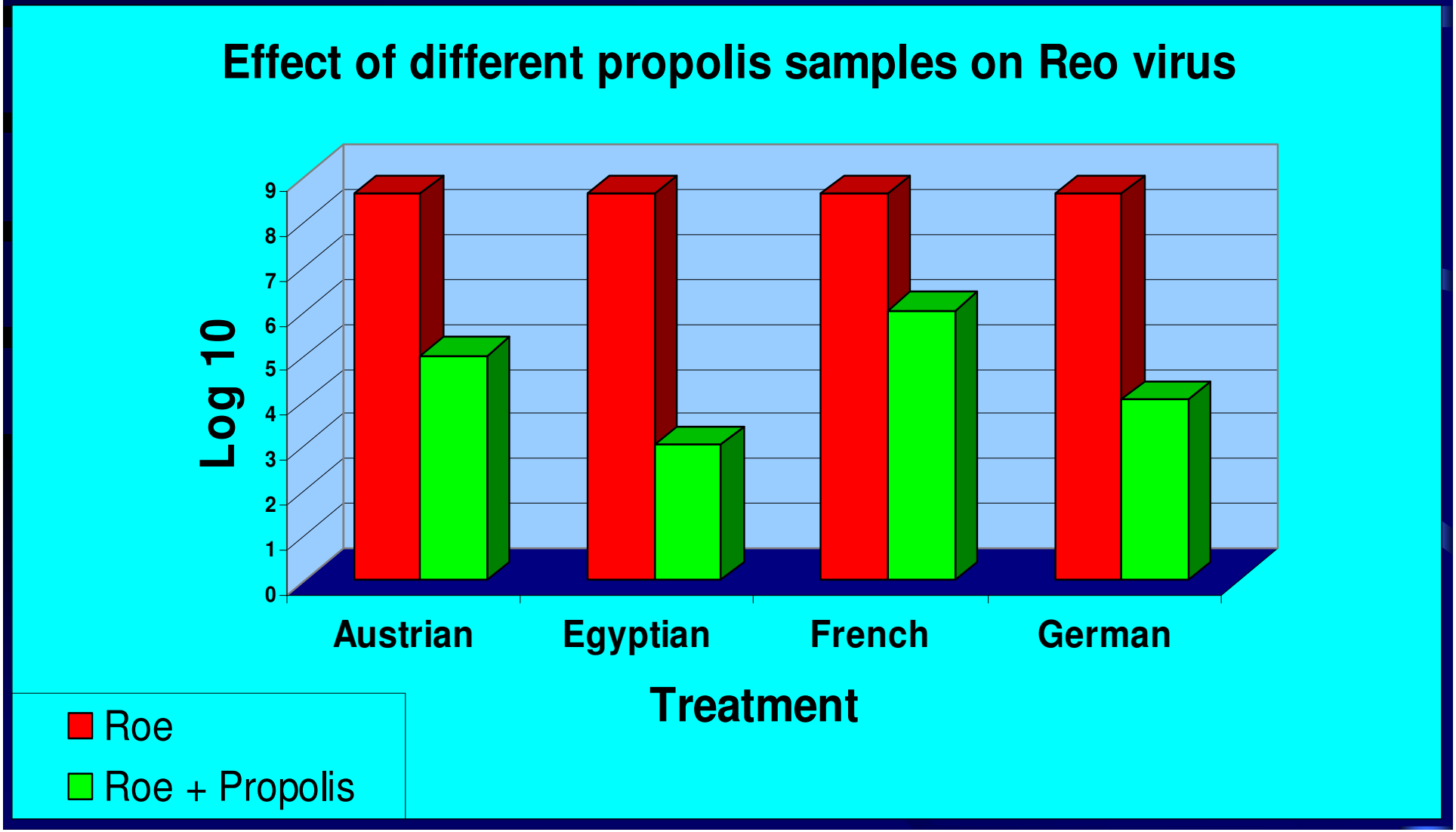
Antiviral activity

- It was obvious that the Fennel flower honey induce more pronounced results than coriander honey.
- These results gave a prospective therapeutic activity as antiviral agent.

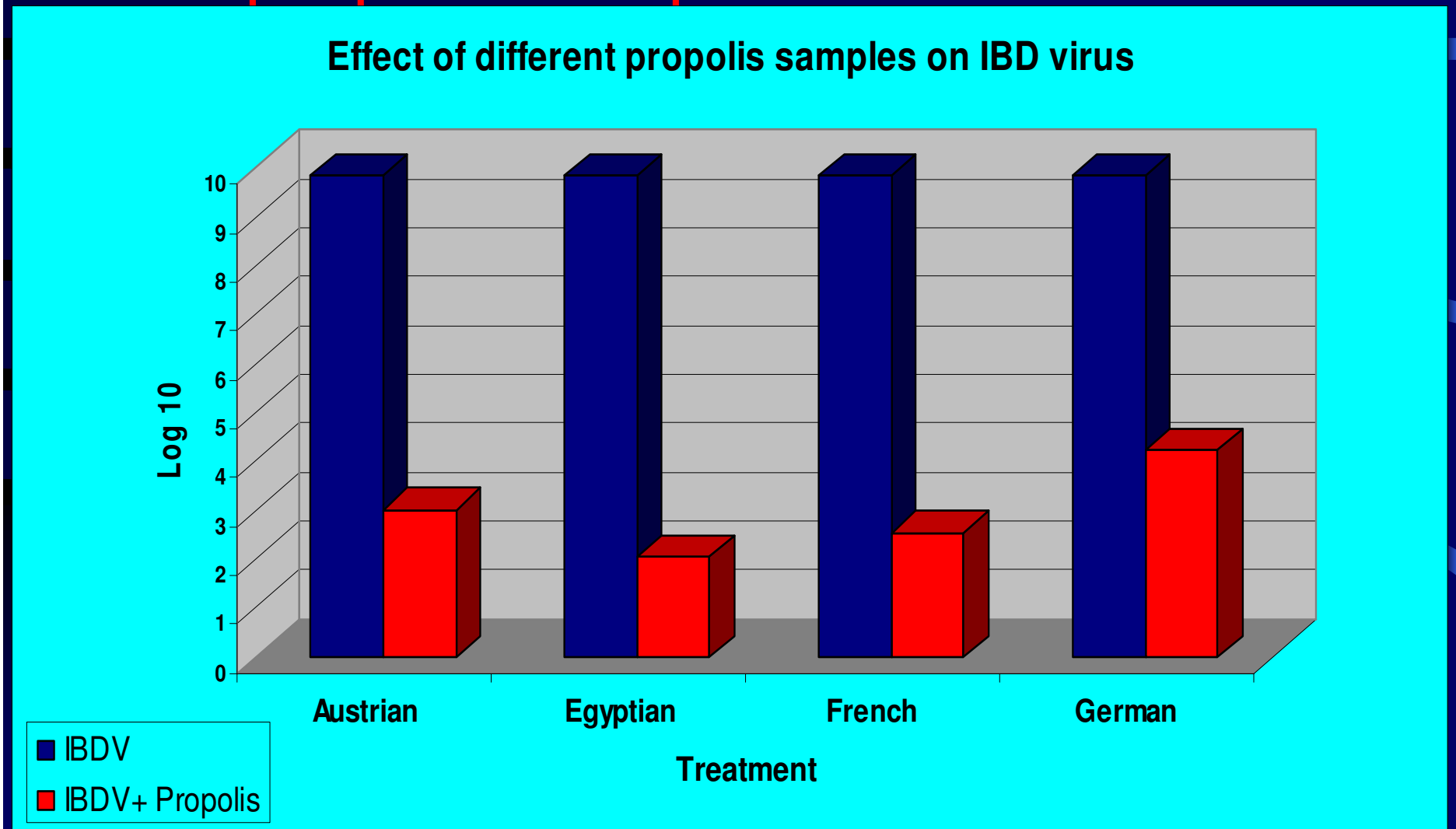
The effect of propolis on the infectivity titers as measured by the mean tissue culture infective dose ($TCID_{50}$) of Roe and IBDV viruses against Egyptian and Eurpean propolis

- **It was clear that the all propolis samples from different countries revealed reduction in the infectivity mean titers of the Roe virus.**

Results: The reduction varied from propolis sample to the another.



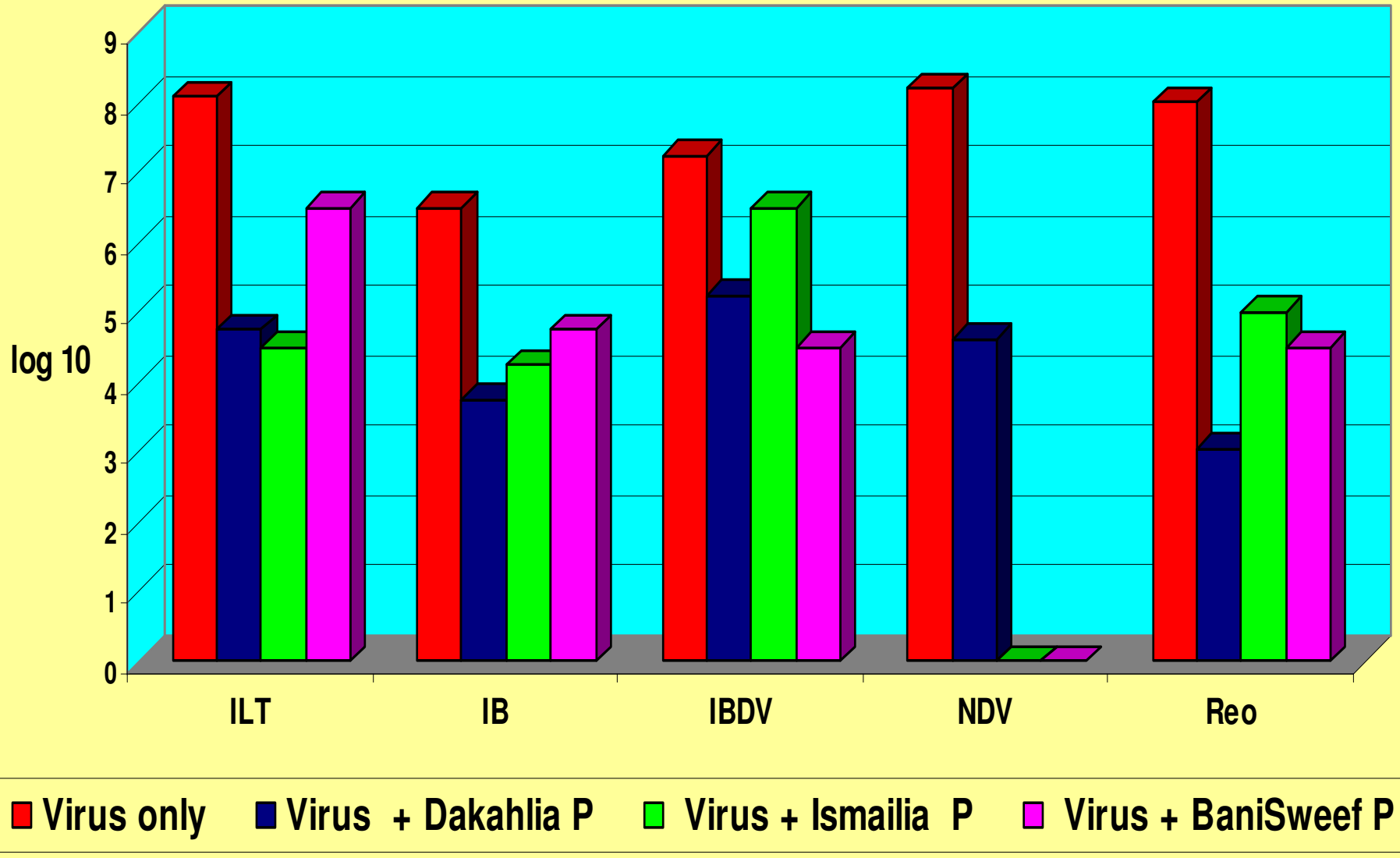
Results: The reduction varied from propolis sample to the another.



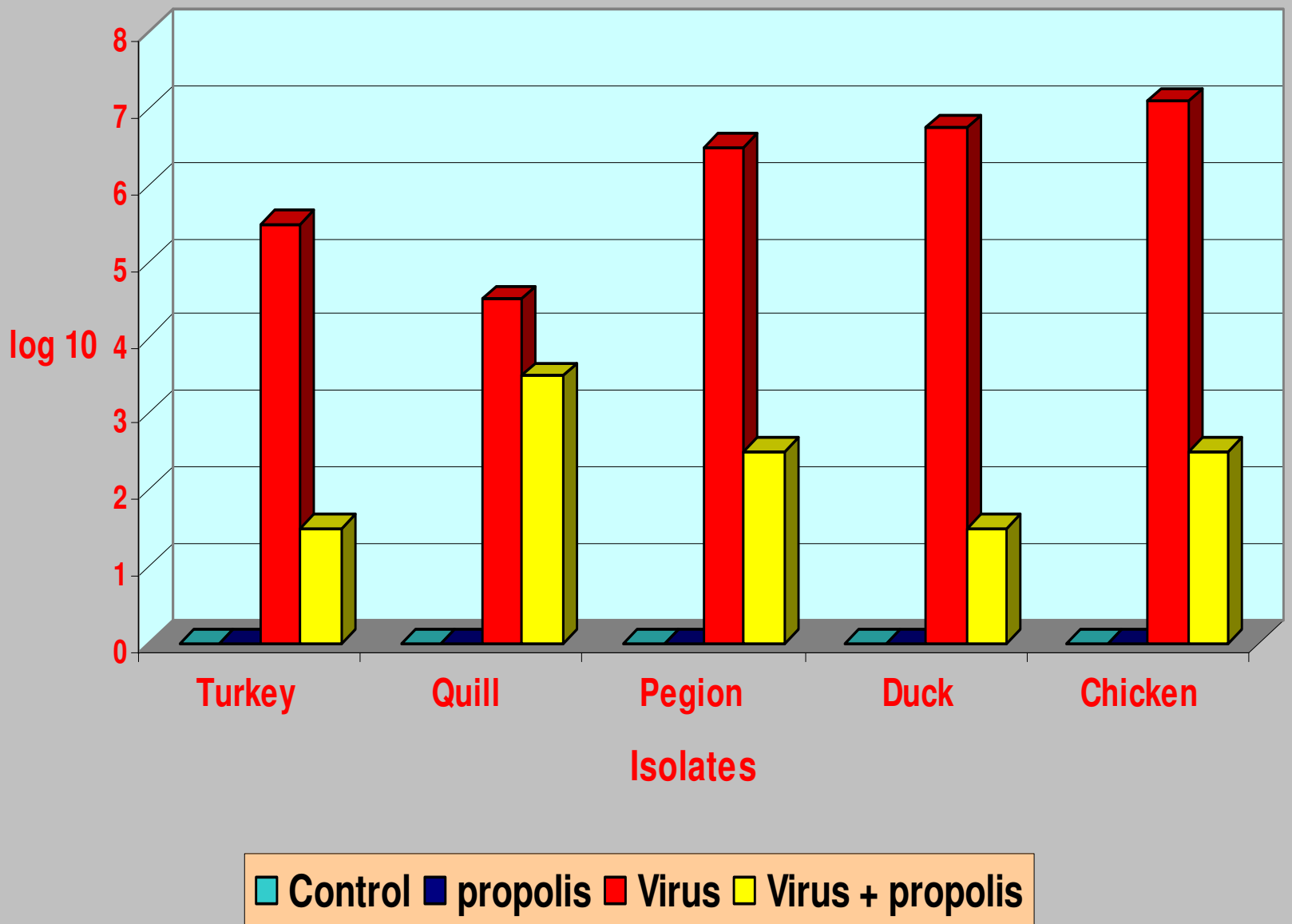
Antiviral activity

Hegazi et al., (2003) studied the Antiviral activity of propolis against Reo, IBDV, NDV, ILT, and IB viruses was determined to evaluate the infectivity titter in embryonated chicken fibroblast.

Antiviral activity of propolis



Effect of propolis on virus titer



Histopathological findings

Bursa	Virus								Virus + propolis							
	Depletion of lymphoid follicles		Epithelial Hyperplasia		Cystic formation		Hemorrhage		Depletion of lymphoid follicles		Epithelial Hyperplasia		Cystic formation		Hemorrhage	
	4 d	21 d	4 d	21 d	4 d	21 d	4 d	21 d	4 d	21 d	4 d	21 d	4 d	21 d	4 d	21 d
Turkey	++	++	++						+	+	+				+	
Quill	+++ +		++	+++				++	+							
Pigeon	++	++	++	++					+		+	+				
Duck		++	++		++		++	++	+		+	+			+	
Chicken	++	++	++	++					+		+	+				

Histopathological findings

Spleen	Virus				Virus + propolis			
	Depletion of lymphoid follicles		Hemorrhage		Depletion of lymphoid follicles		Hemorrhage	
	4 d	21 d	4 d	21 d	4 d	21 d	4 d	21 d
Turkey	++	+++				+	+	
Quill	++	++		++++	+			
Pigeon	++	++	++			+	+	+
Duck	++			++	+			+
Chicken	++	++	++			+		

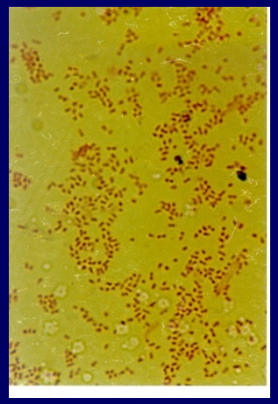
Histopathological findings

Kidney	Virus								Virus + propolis							
	Congested renal blood vessels		**Granular degeneration of renal tissue**		**Hemorrhage**		**Hyperplasia of glom ruler tuft**		**Congested renal blood vessels**		**Granular degeneration of renal tissue**		**Hemorrhage**		**Hyperplasia of glom ruler tuft**	
	4 d	**21 d**	**4 d**	**21 d**	**4 d**	**21 d**	**4 d**	**21 d**	**4 d**	**21 d**	**4 d**	**21 d**	**4 d**	**21 d**	**4 d**	21 d
Turkey	++	++	++	++		++				+				+		
Quill	++++	++				+	+++		++							
Pigeon	++	++	++	+++	+	++	++		+	+	+					
Duck	++	++		++							+					
Chicken		++++	++		++	++++						++		++		

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  - Antifungal activity
  - Antioxidant activity
  - Ophthalmology

Antibacterial activity



- Many researchers had investigated the antibacterial activity of propolis and its extracts against Gram-positive and Gram-negative strains

Antimicrobial activity

- The antimicrobial activity of propolis against a wide range of bacteria, fungi, yeasts and viruses has been investigated since the late 1940s and it showed variable activity against different microorganisms.

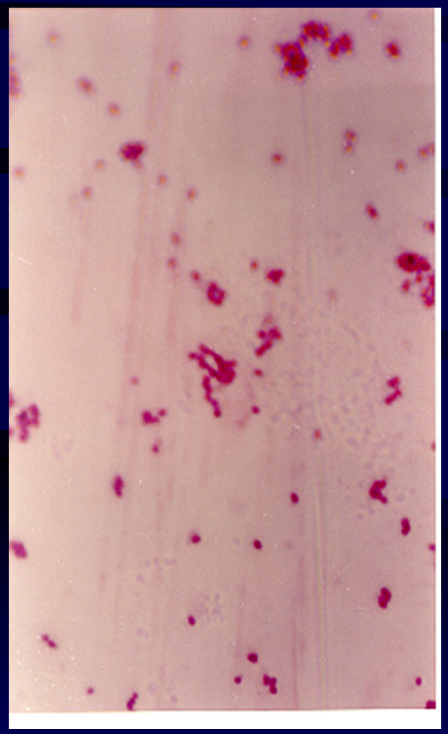


Antibacterial activity



- They found that propolis had antibacterial activity against a wide range of Gram-positive rods but had a limited activity against Gram-negative bacilli

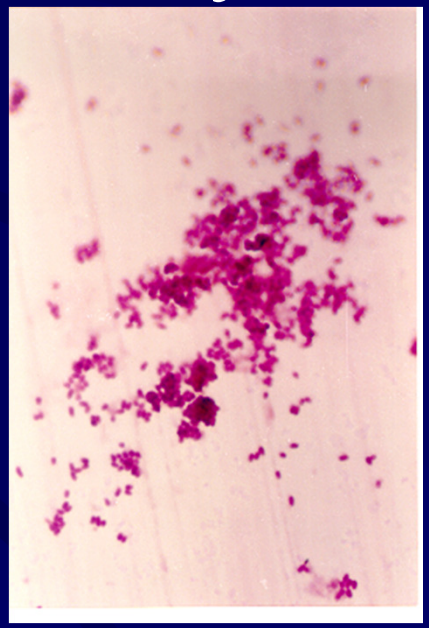
Antibacterial activity



- The bactericidal effect of propolis was tested by Hegazi et al. (1995-a), who found that it had a bactericidal effect on Staphylococcus and E. coli strains at concentrations of 7-23 mg/ml.

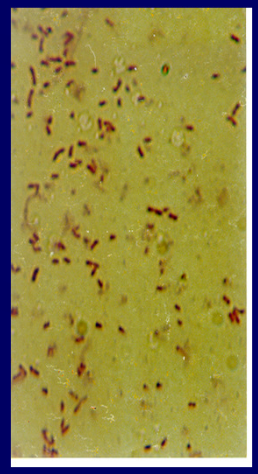
Antibacterial activity

- Minimum inhibitory concentration of propolis against *S. aureus* strains and E. coli were determined by Hegazi et al., (1995a).



Antibacterial activity

- Shoeib et al (1997) studied the antibacterial activity of propolis against 32 different bacteria isolated from skin lesions, including impetigo, wound infection and carbuncles. They found propolis has an inhibitory effect 62 % of alcoholic extract.



Antibacterial activity

- Hegazi et al., 1997 studied the minimum inhibitory concentration (MIC) of ethanolic extract of Egyptian propolis (EEP) was determined by two-fold dilution method against :
- *Staphylococcus aureus*

Antibacterial activity

- *Streptococcus faecalis*
- *Corynebacterium pseudotuberculosis*
- *Aeromonas hydrophila*
- *Escherichia coli*
- *Salmonella typhimurium.*

Antibacterial activity

- The results revealed that the optimum concentration of Egyptian propolis that induced the greatest visible inhibition of growth was varied according to the type of pathogen and the geographic zone.

Antibacterial activity

- It obvious that the pronounced antimicrobial activity of ethanolic extract of Egyptian propolis (EEP) was in Gram positive bacteria.

Antibacterial activity

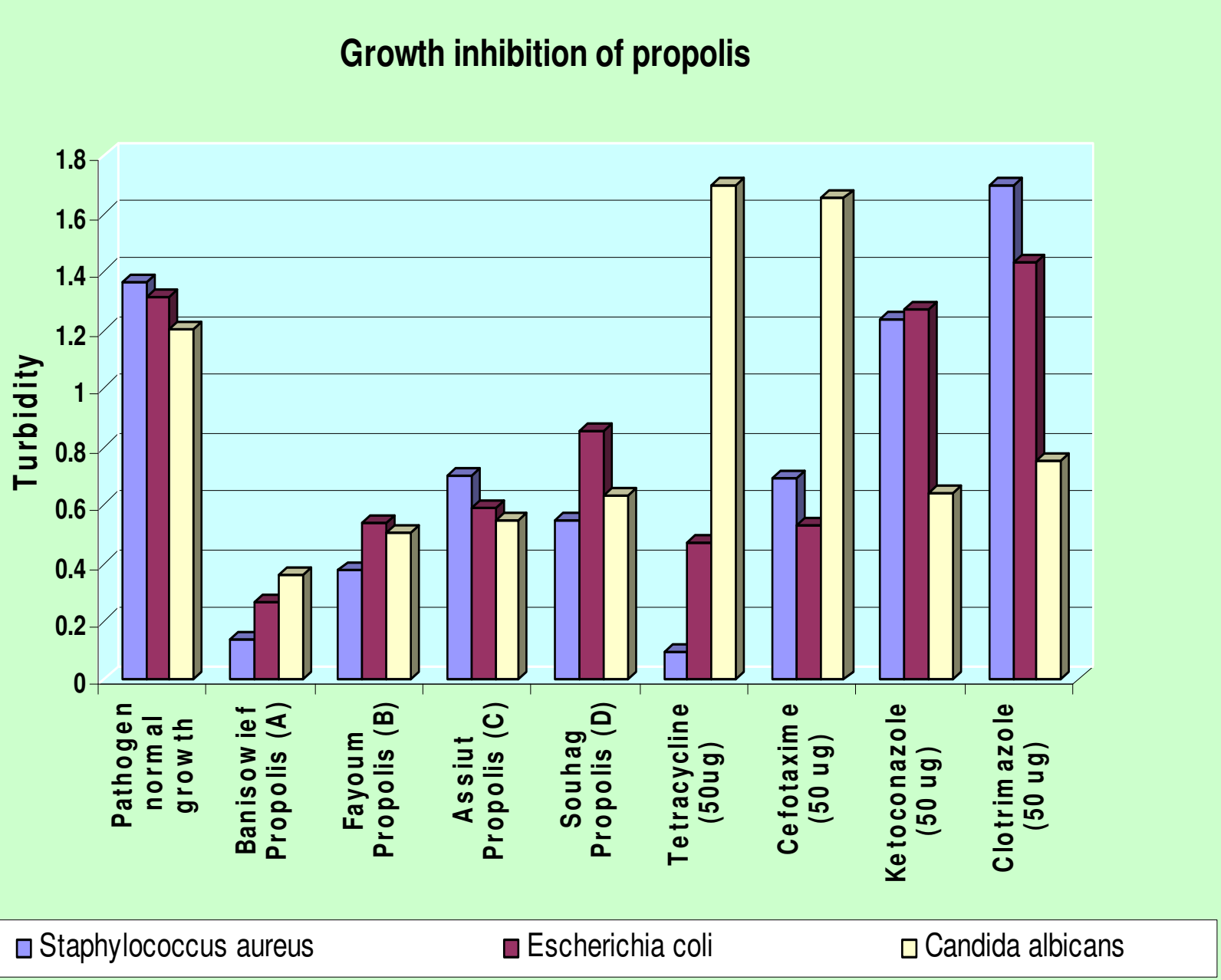
- Salem et al (1997) studied the antimicrobial properties of extracts of 15 propolis samples taken from Nile Delta region of Egypt and Cluj Napoca Romania, have been screened in-vitro against different bacteria (3 Gram + ve, 3 Gram -ve)

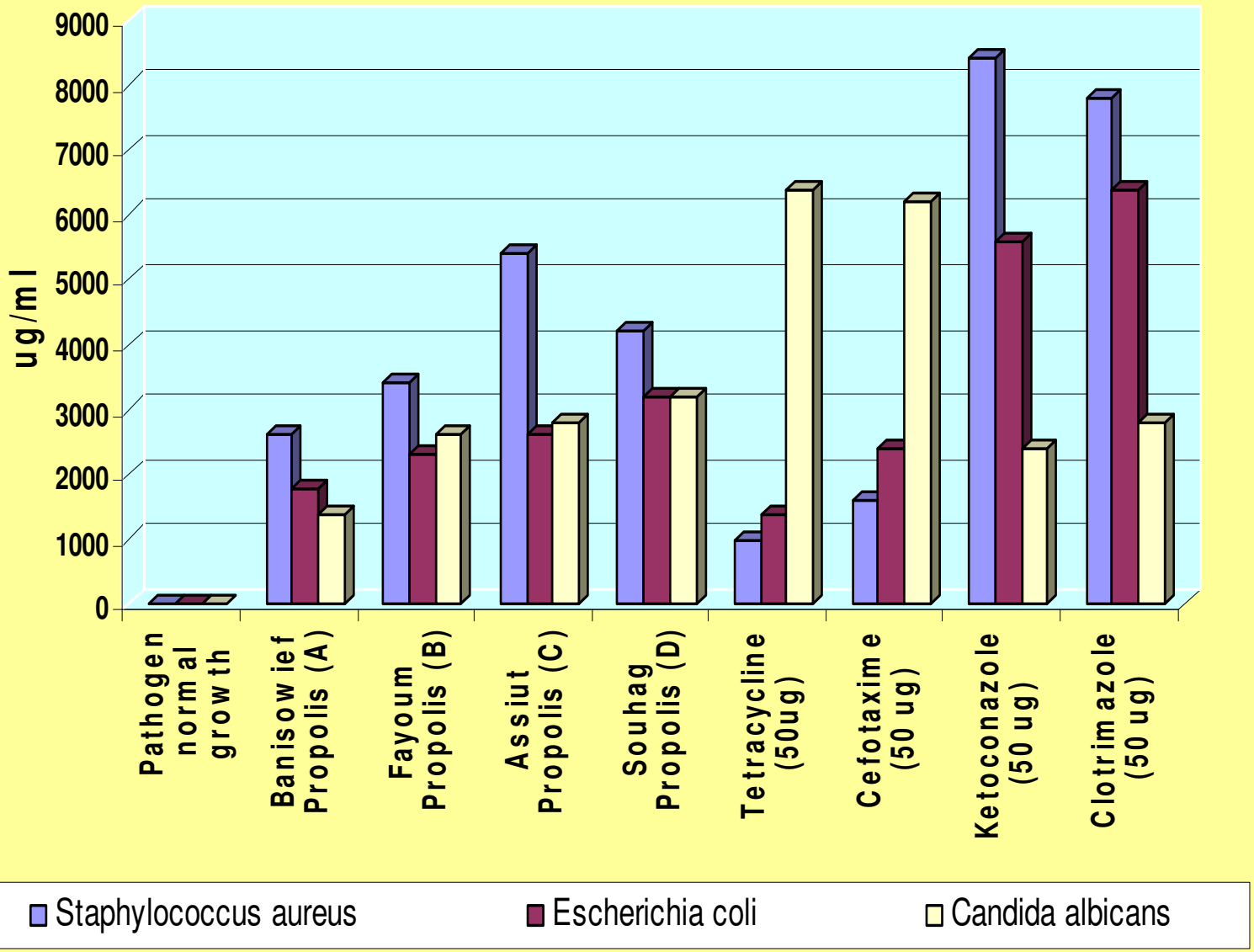
Antibacterial activity

- They found that all extracted samples showed antimicrobial effect. Staphylococcus aureus CAIM 1352 was the most sensitive organism against the propolis extracts. All samples examined showed antimicrobial effect against Gram +ve bacteria and had also effect against some Gram -ve bacteria

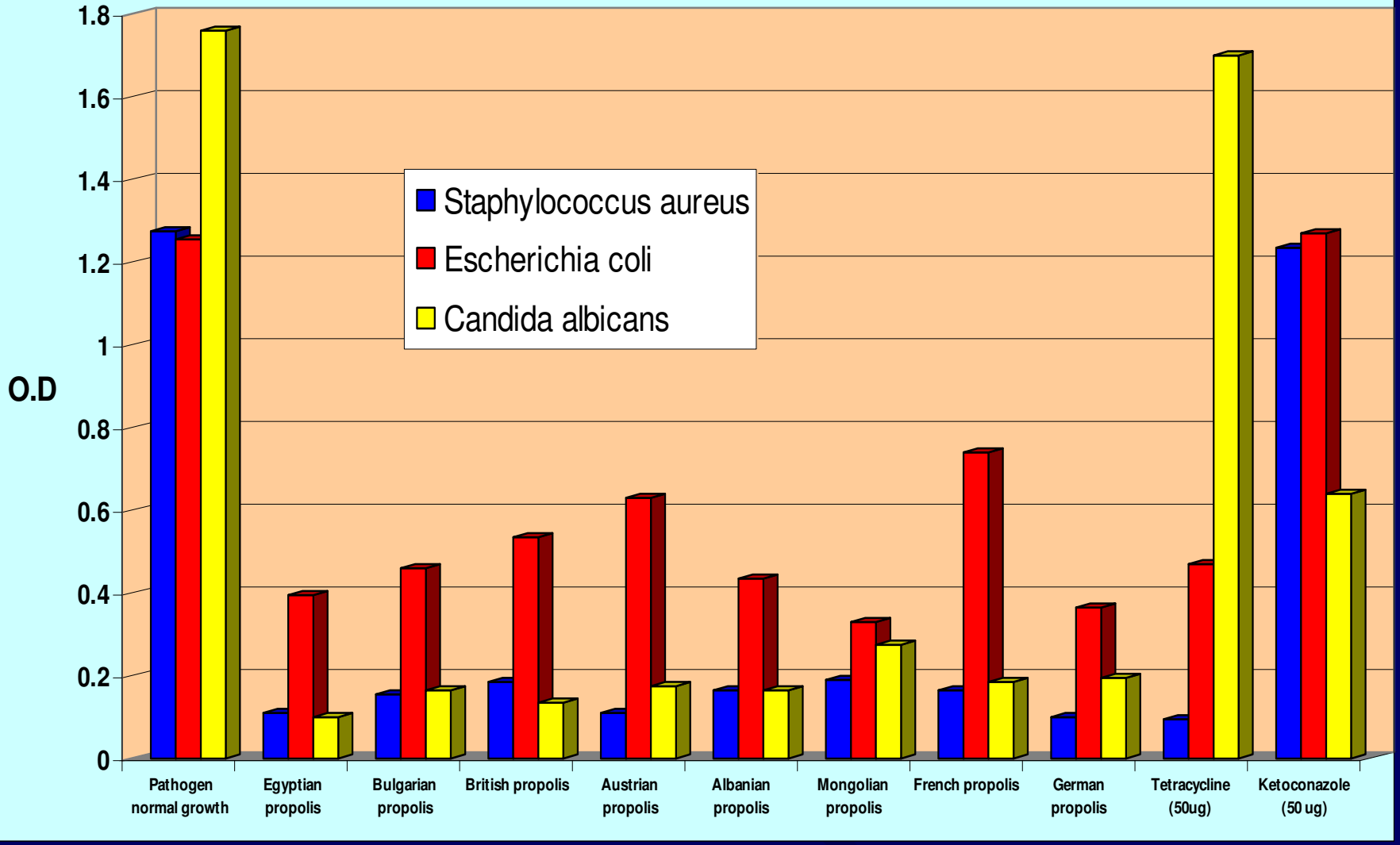
Antibacterial assay:

Hegazi and Abd El Hady (2001) found that the inhibition of the *Staphylococcus aureus and Escherichia coli* growth due to propolis of upper Egypt.

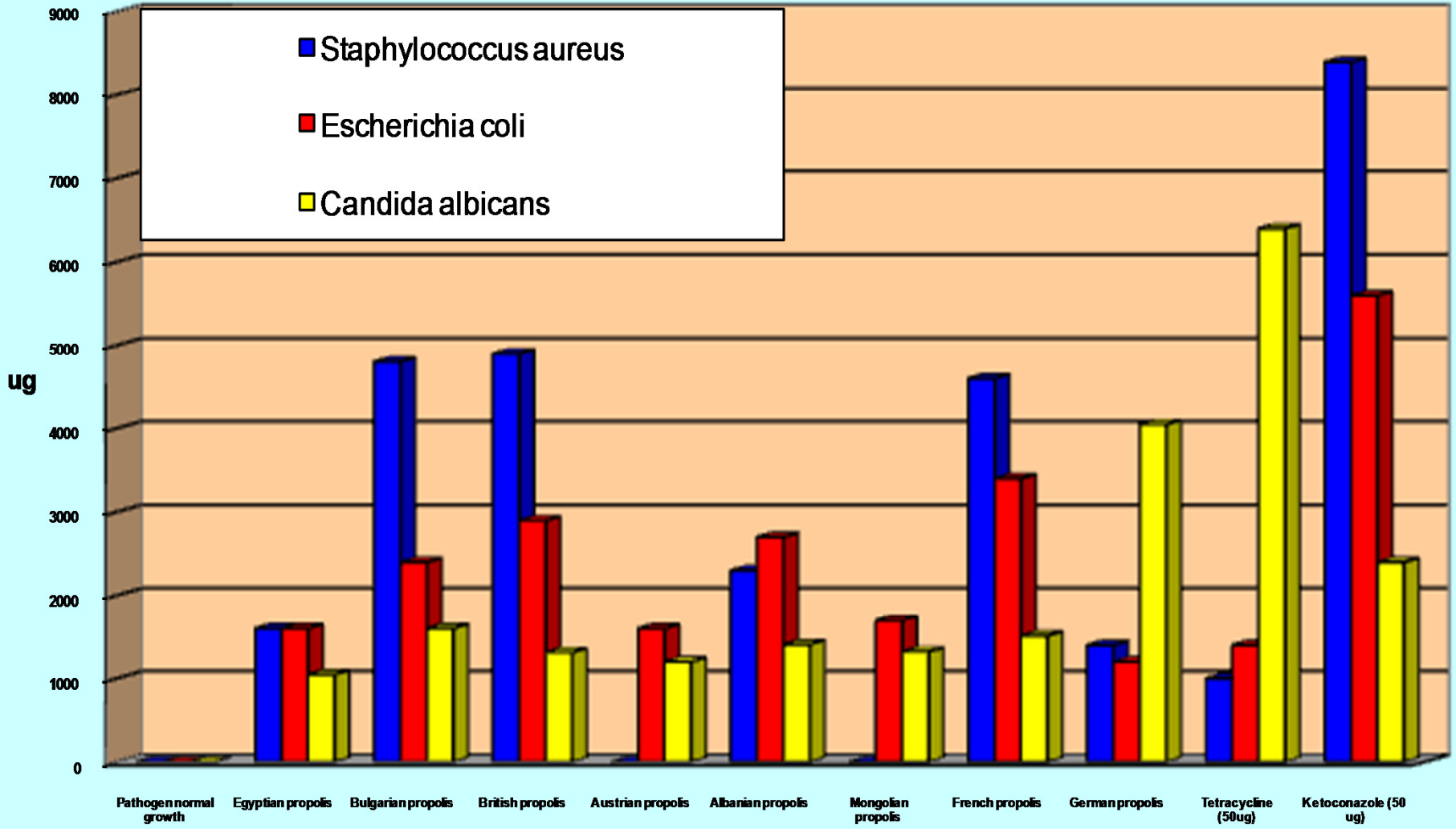

Growth inhibition of propolis
Turbidity
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Pathogen normal growth
Banisowief Propolis (A)
Fayoum Propolis (B)
Assiut Propolis (C)
Souhag Propolis (D)
Tetracycline (50ug)
Cefotaxime (50 ug)
Ketoconazole (50 ug)
Clotrimazole (50 ug)
Staphylococcus aureus
Escherichia coli
Candida albicans


MIC (ug/ml) of propolis
ug/ml
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Pathogen normal growth
Banisowief Propolis (A)
Fayoum Propolis (B)
Assiut Propolis (C)
Souhag Propolis (D)
Tetracycline (50ug)
Cefotaxime (50 ug)
Ketoconazole (50 ug)
Clotrimazole (50 ug)
Staphylococcus aureus
Escherichia coli
Candida albicans

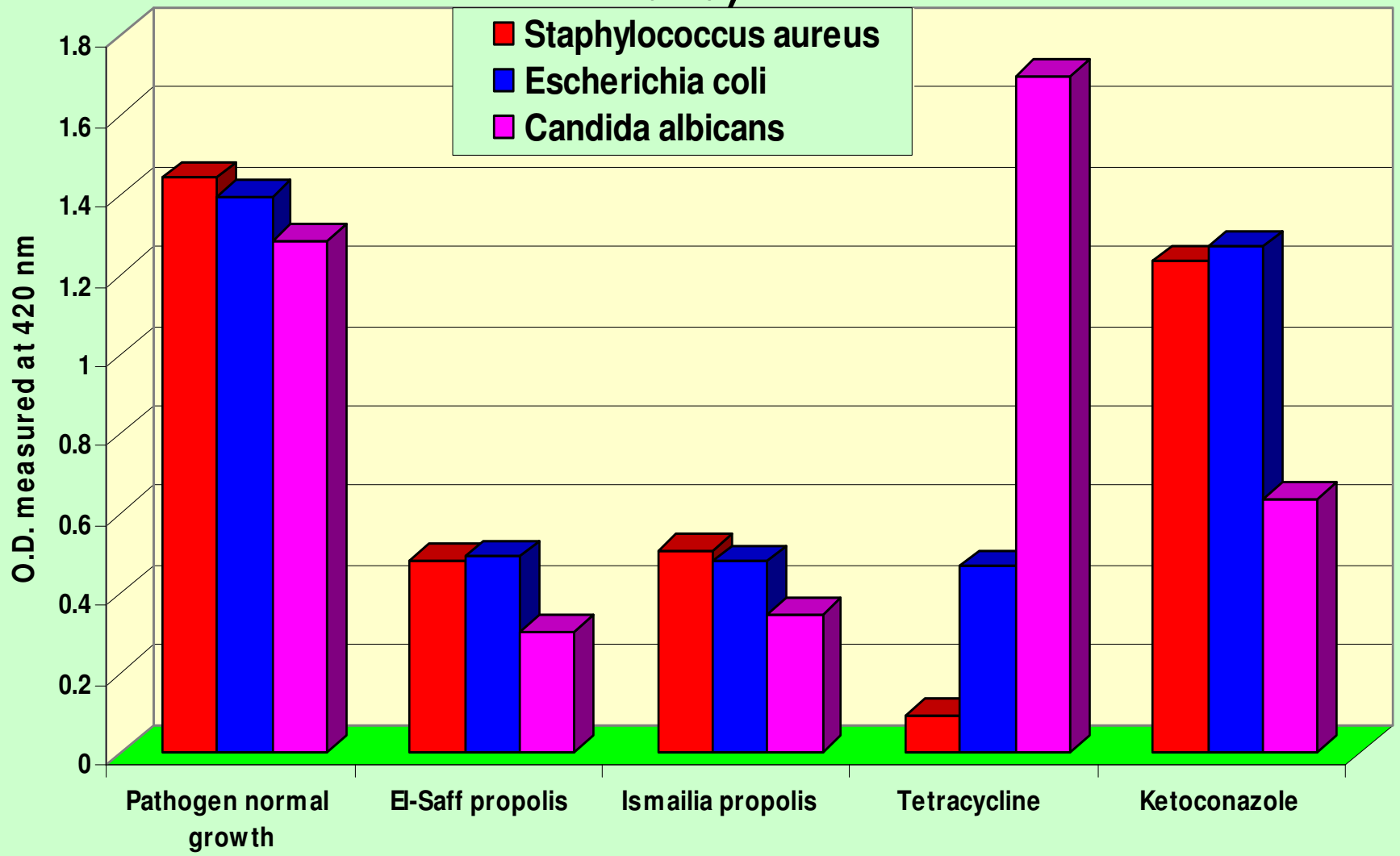
Growth Inhibition



MIC


Staphylococcus aureus
Escherichia coli
Candida albicans
ug
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Pathogen normal growth
Egyptian propolis
Bulgarian propolis
British propolis
Austrian propolis
Albanian propolis
Mongolian propolis
French propolis
German propolis
Tetracycline (50ug)
Ketoconazole (50 ug)

Antimicrobial activity of Egyptian propolis (Reclamed land)



- **Antimicrobial Activity of Different Egyptian Honeys As Comparison of Saudi Arabia Honey**
-
- **Ahmed .G. Hegazi 2011**

Antimicrobial activity to Staph.



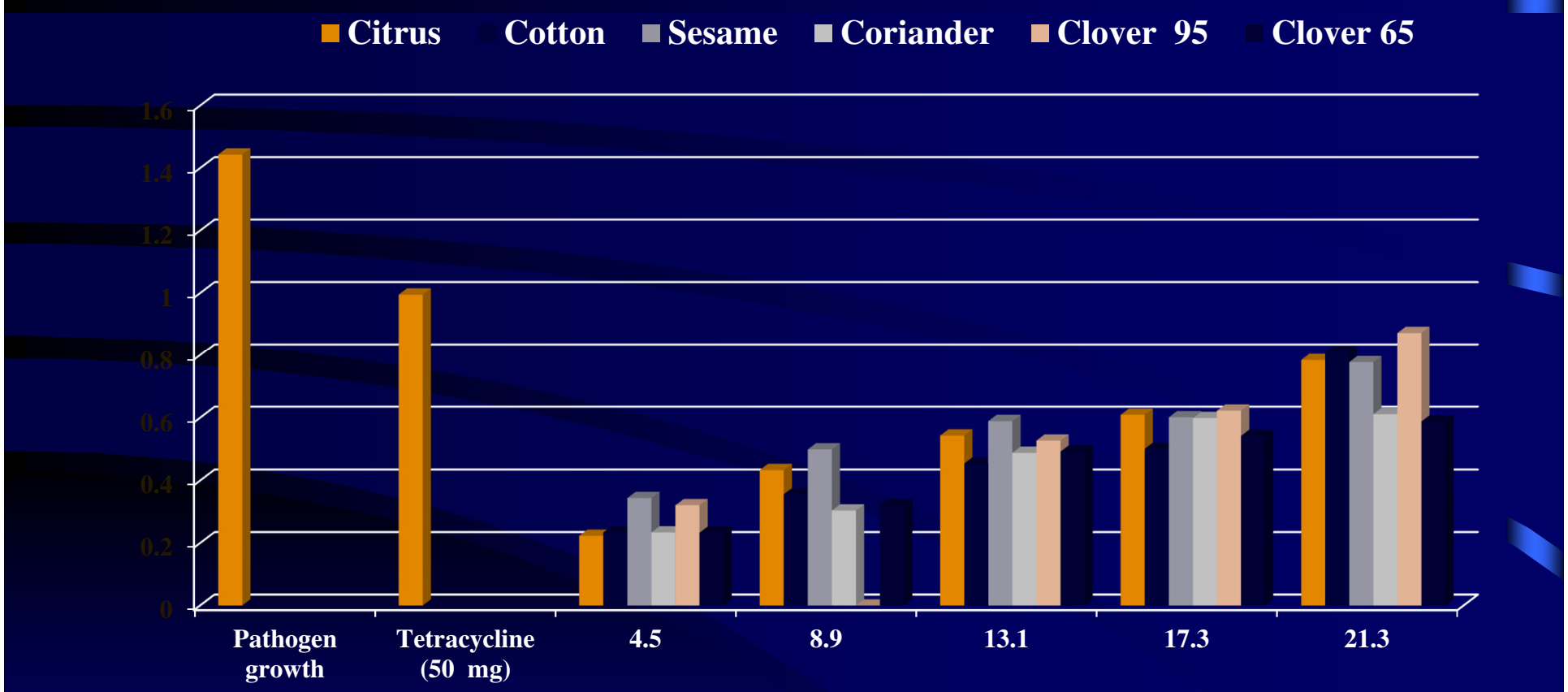
Antimicrobial activity to pseudomonas



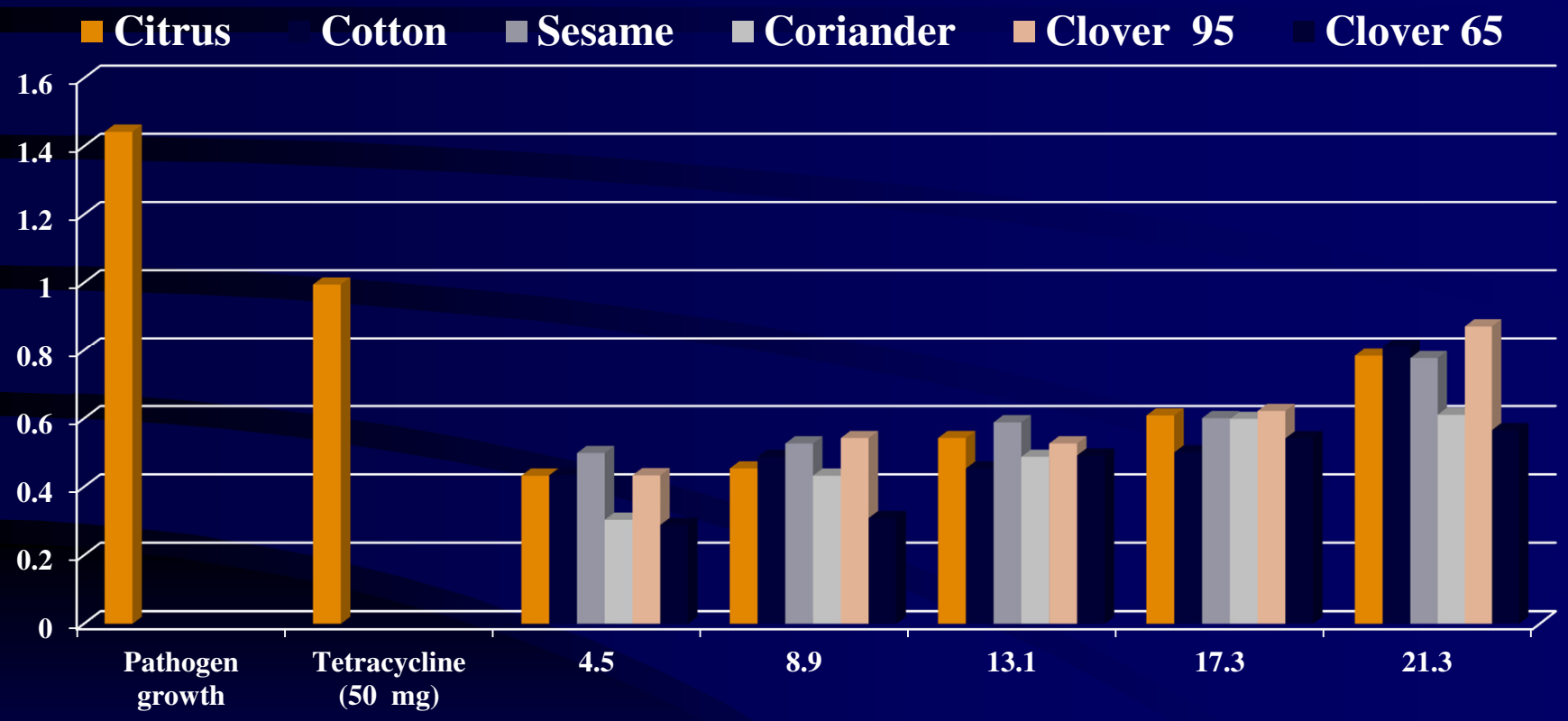
Antimicrobial activity against E. coli



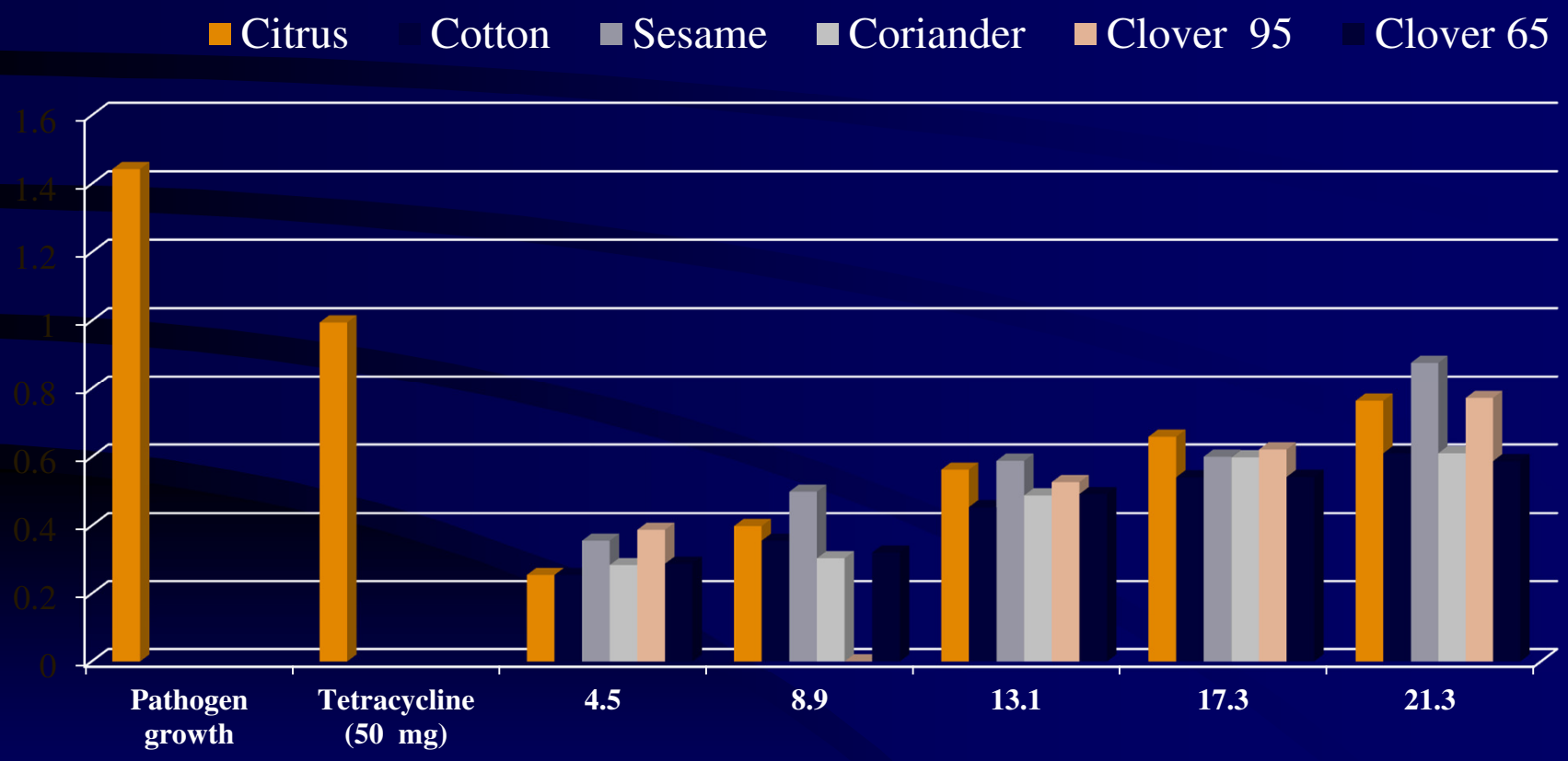
Staphylococcus aureus



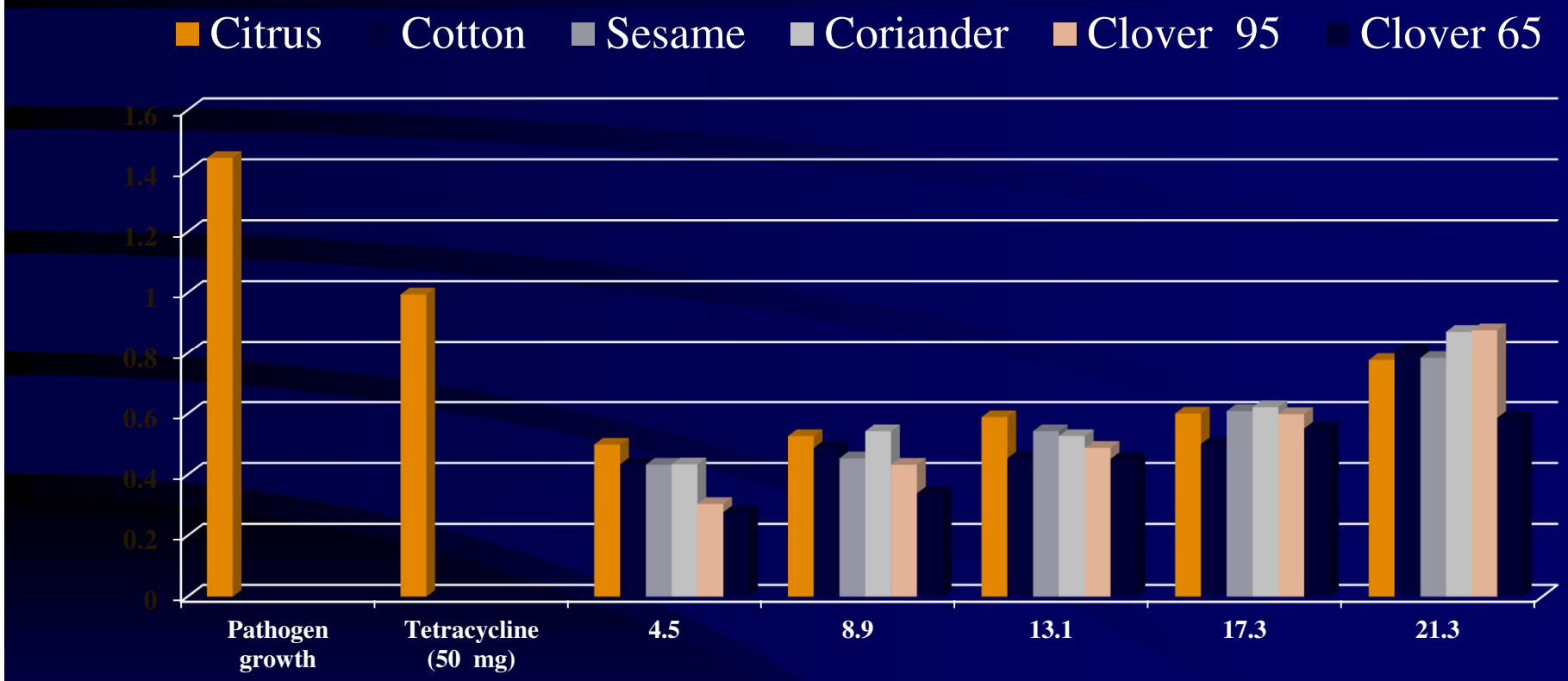
Streptococcus faecalis



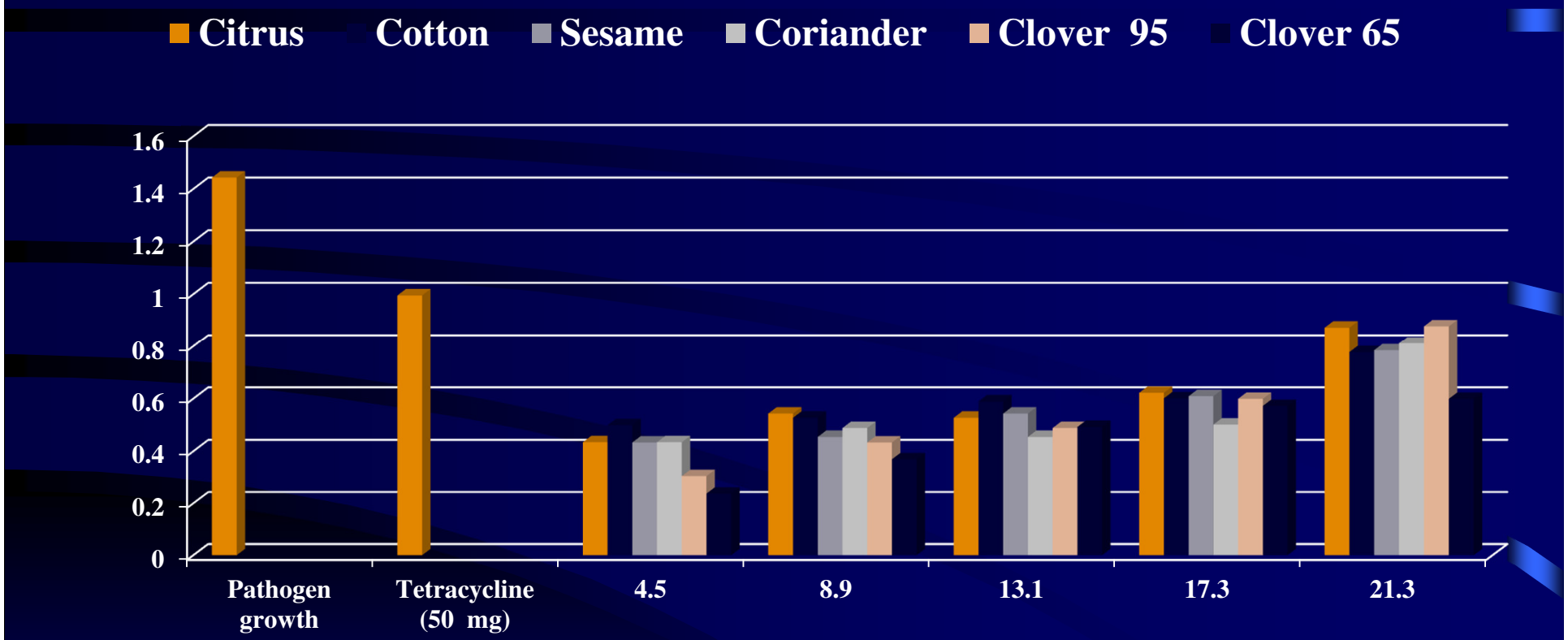
Corynebacteria pseudotuberculosis



Pseudomonas aeruginosia

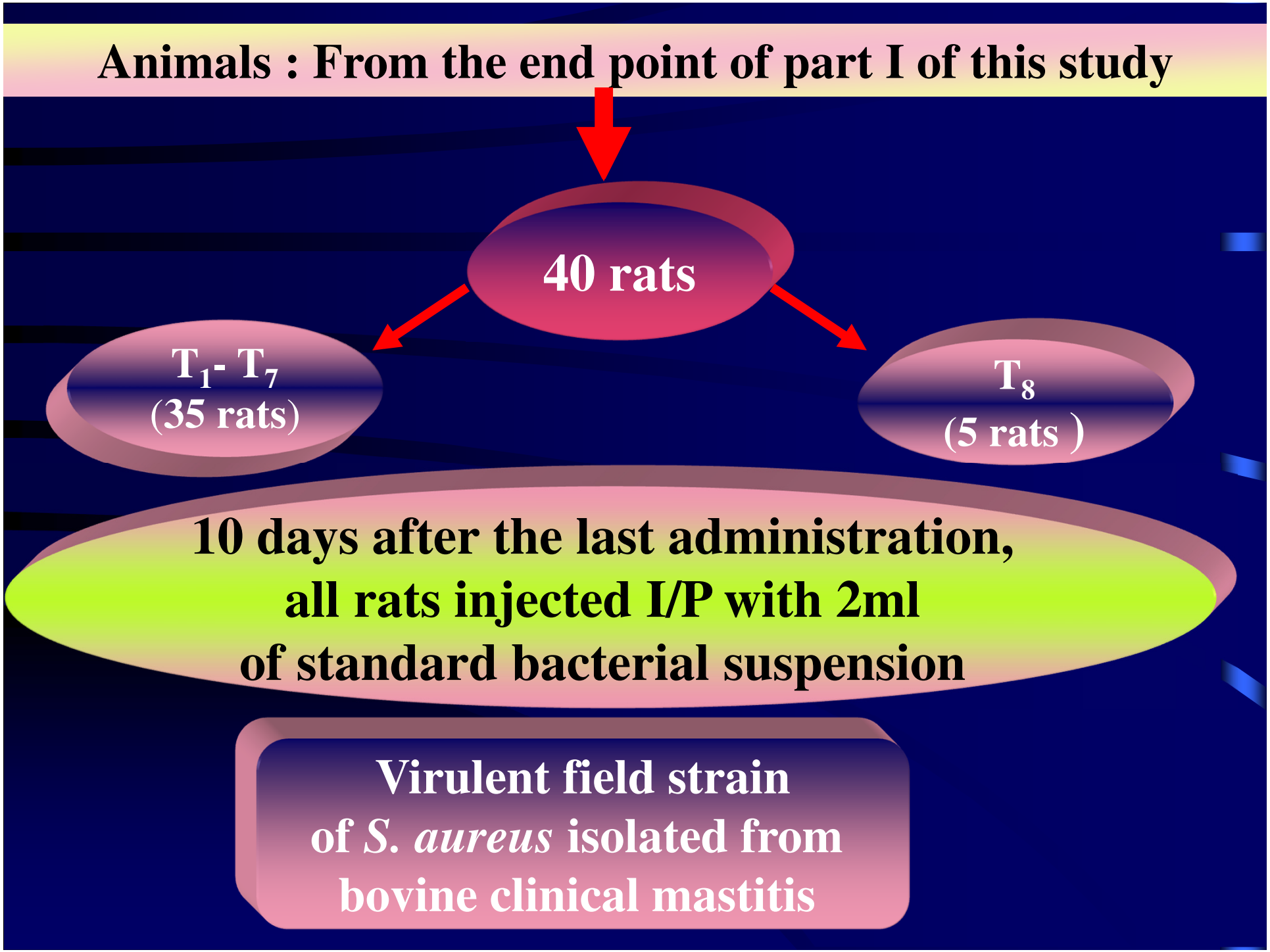


E coli


Citrus
Cotton
Sesame
Coriander
Clover 95
Clover 65
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Pathogen growth
Tetracycline (50 mg)
4.5
8.9
13.1
17.3
21.3

Immunodefence of previously Api-immunized rats against induced staphylococcal infection.

Challenge experiments

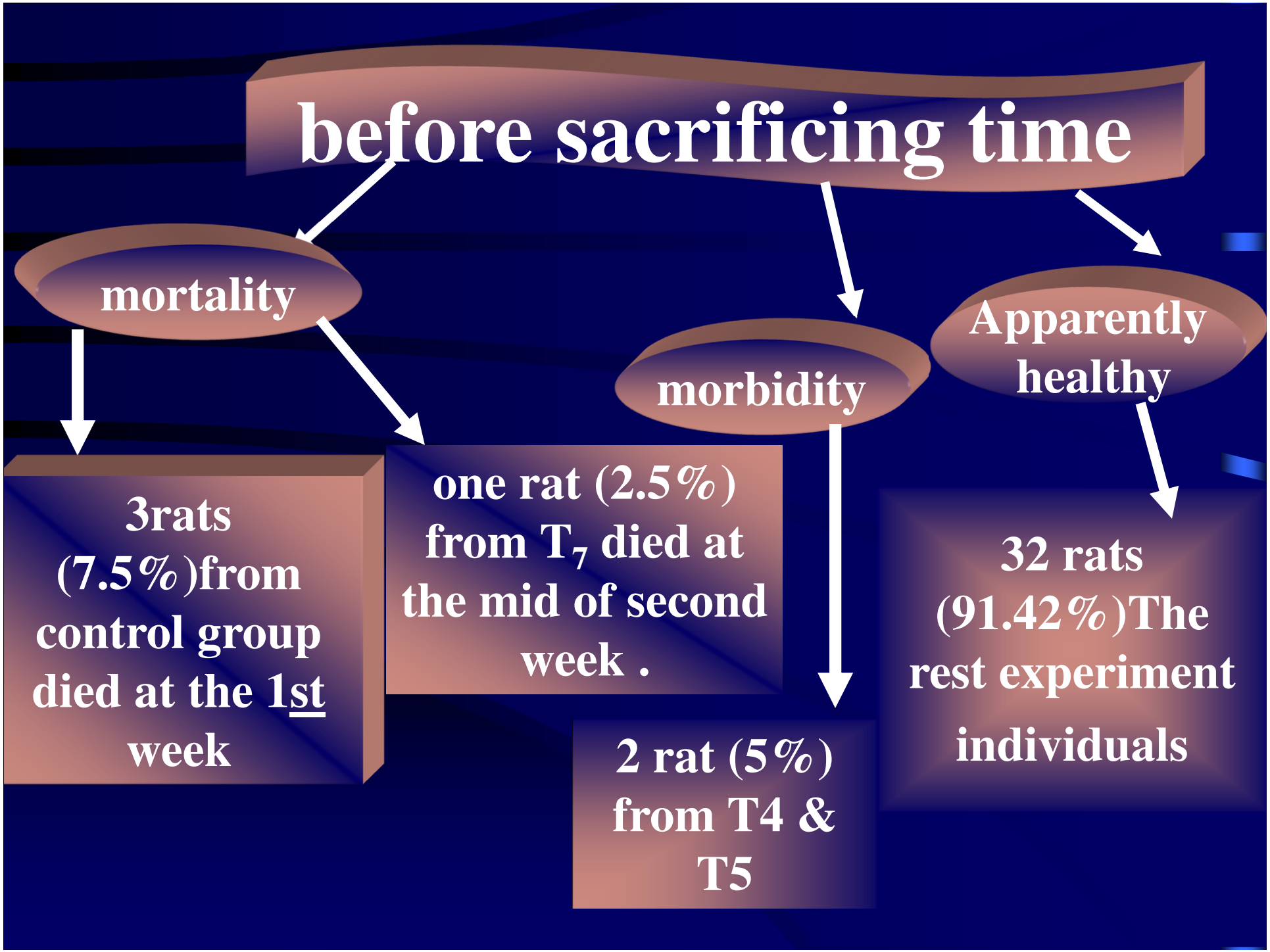

Animals : From the end point of part I of this study
40 rats
T1- T7
(35 rats)
T8
(5 rats)
10 days after the last administration,
all rats injected I/P with 2ml
of standard bacterial suspension
Virulent field strain
of S. aureus isolated from
bovine clinical mastitis

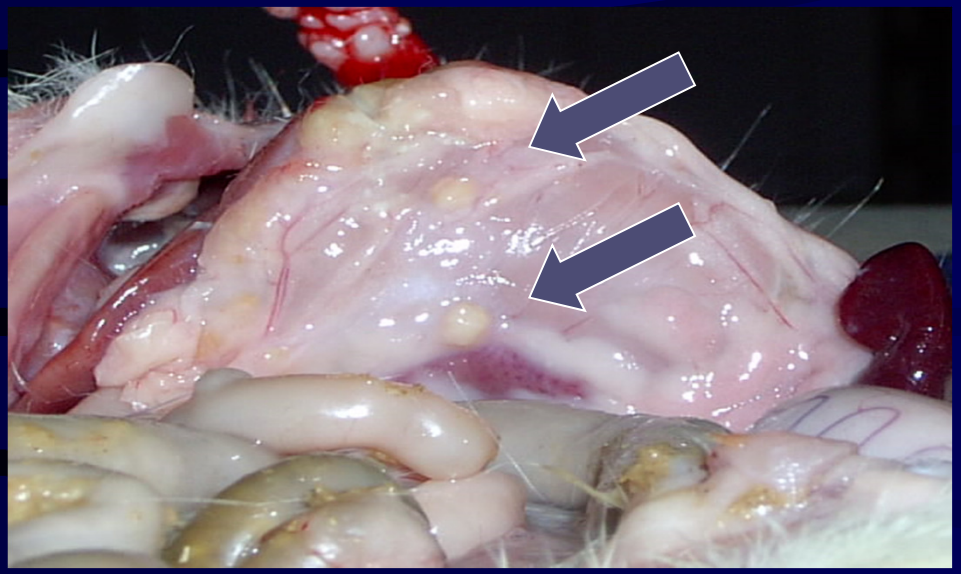
Two weeks post induced Infection (the full term experiment)

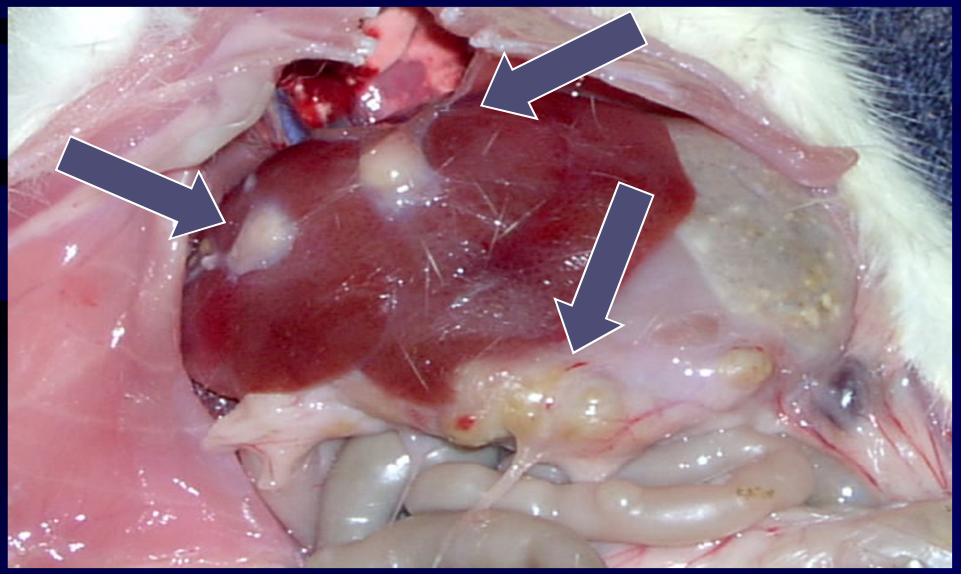
all rats were sacrificed and eviscerated for PM inspection and prepared for histopathlogical study.

Bacterial reisolation

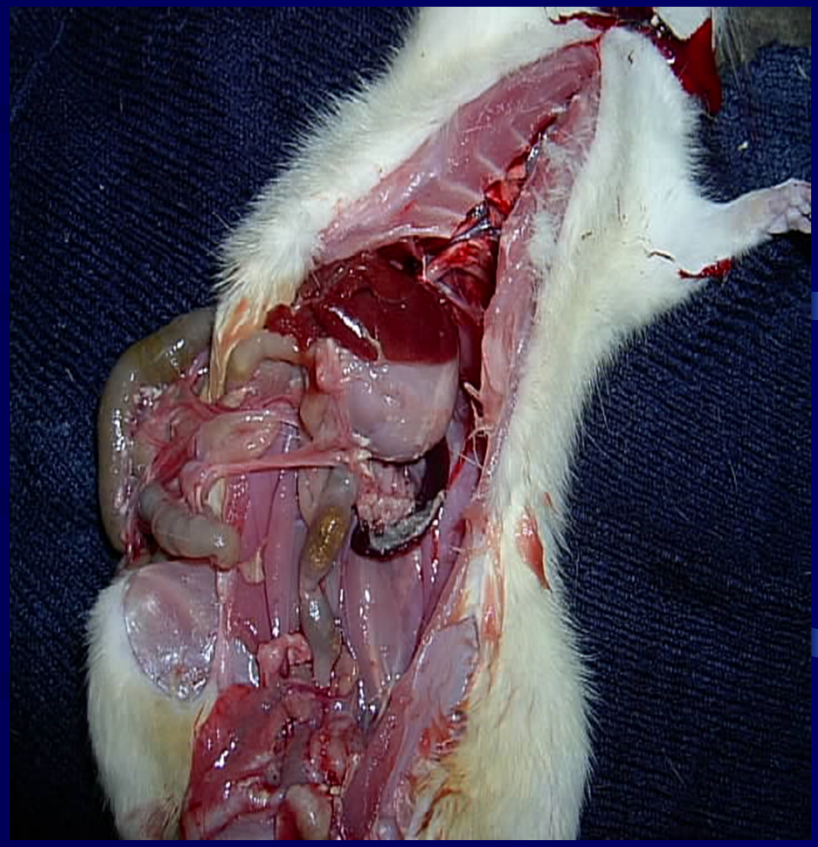
Samples from gross lesions and affected organs were taken for isolation & identification


before sacrificing time
mortality
morbidity
Apparently healthy
3rats (7.5%)from control group died at the 1st week
one rat (2.5%) from T7 died at the mid of second week .
2 rat (5%) from T4 & T5
32 rats (91.42%)The rest experiment individuals

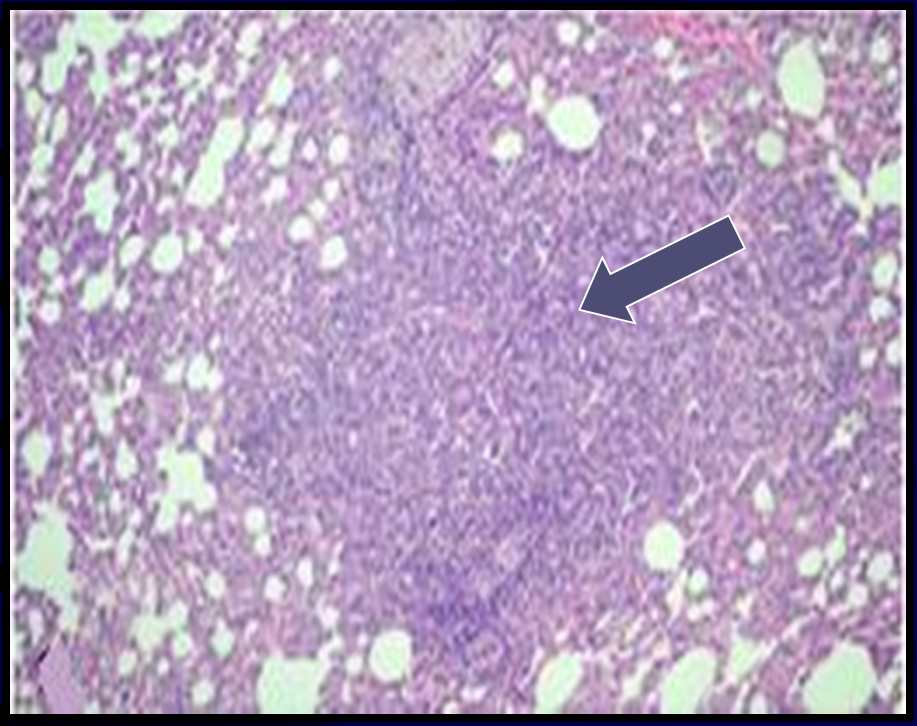




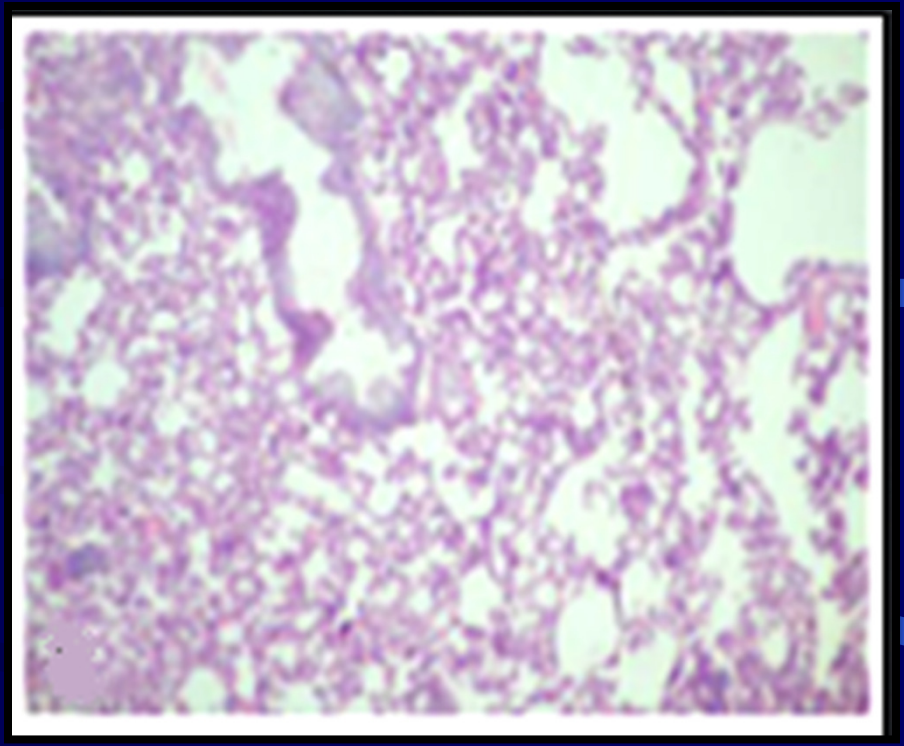
Control rats showing pus nodules



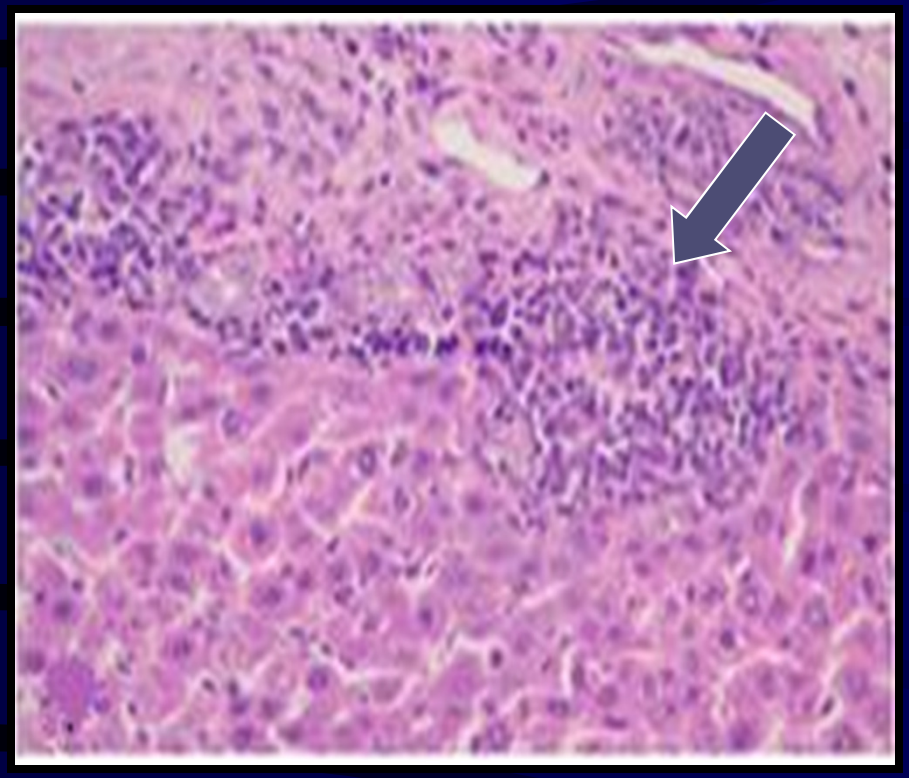
Apiimmunized rat showing normal organs



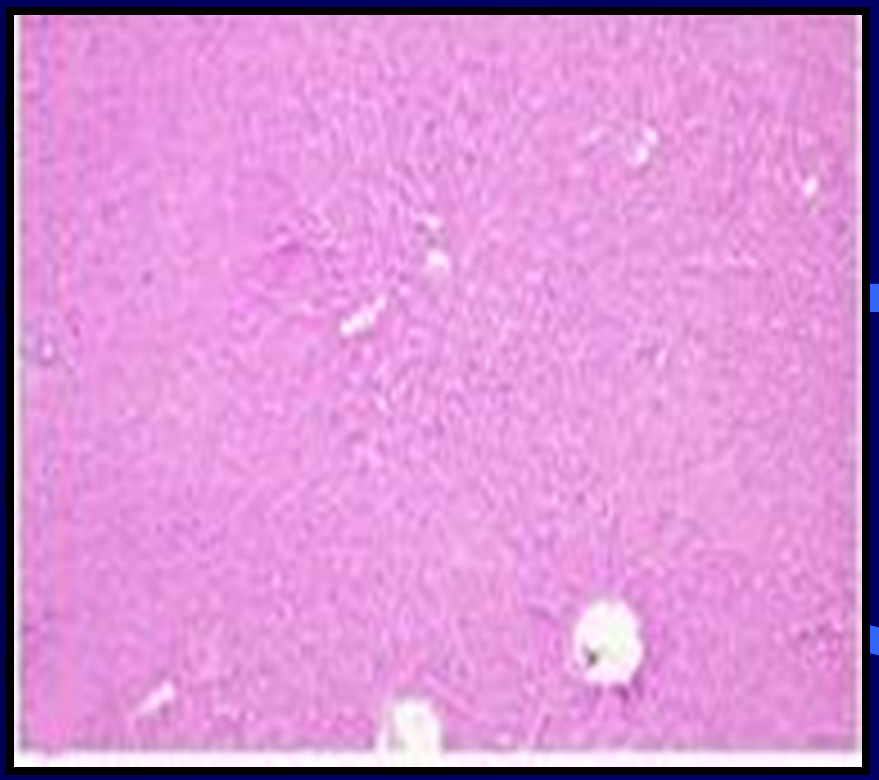
Control rat showing pneumonia in lung



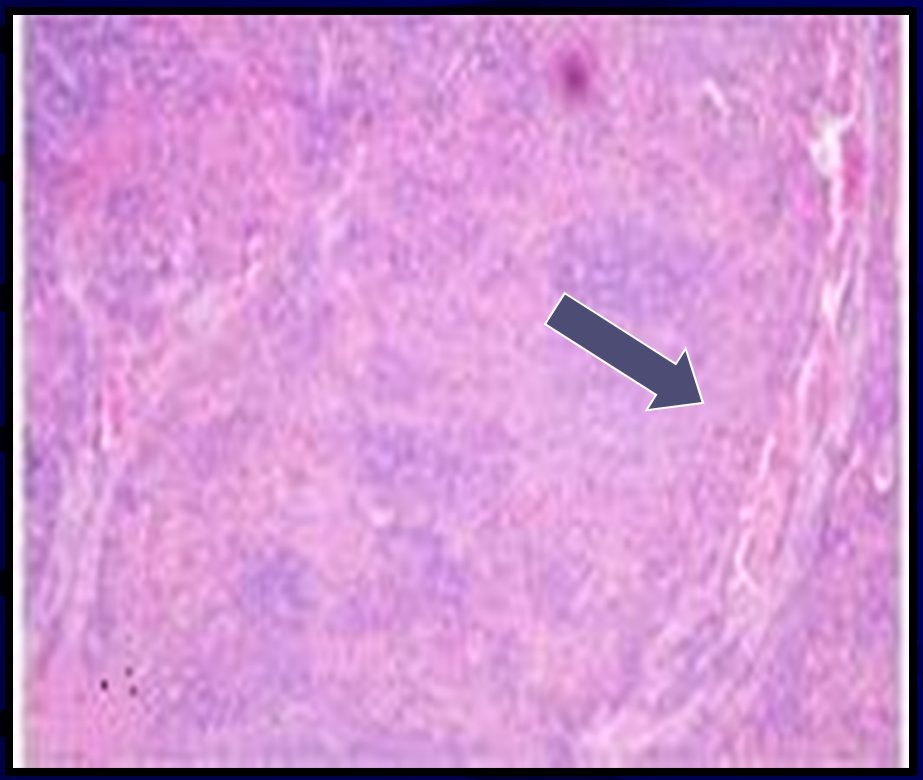
Lung of apiimmunized rat (T_1) showing normal appearance



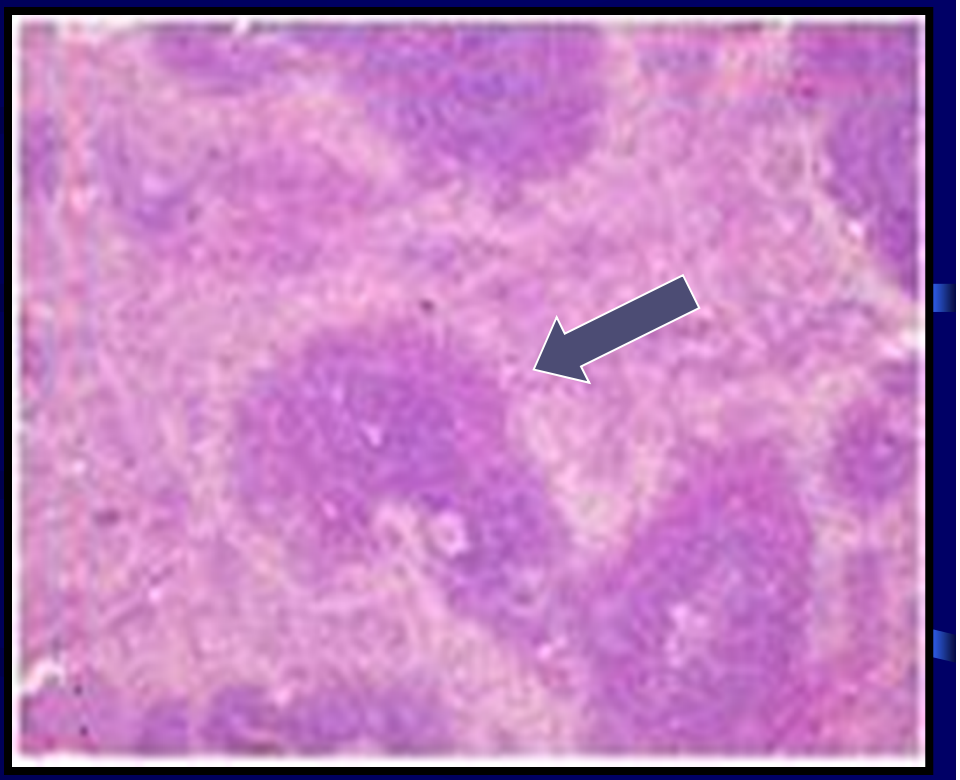
Liver of control rat showing necrobiotic changes and inflammatory cells infiltration around the portal area



Liver of api-immunized rat showing normal hepatocytes and normal blood vessels



Spleen of control rat showing congested blood vessels with thick muscularis area

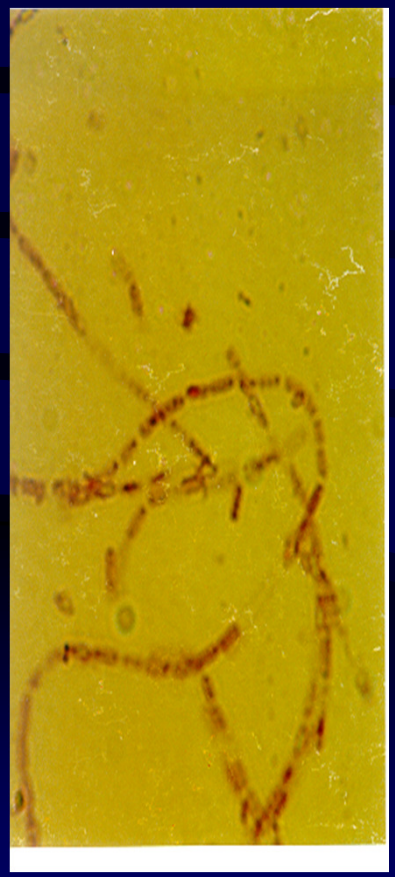


Spleen of api-immunized rat showing highly proliferated lymphatic follicles

VETERNIARY ASPECTS OF APITHERAPY IN EGYPT

- 1-Introduction
- 2-History
- 3- Application
  - Surgery
  - Dermatology
  - Pharmacology
  - Anticancer
  - Immunology
  - Antiviral activity
  - Antibacterial activity
  - Antifungal activity
  - Antioxidant activity
  - Ophthalmology

Antifungal activity



- Hegazi et al (1995) examined the sensitivity of 6 fungal strains to propolis extracts. All the strains displayed a high sensitivity to propolis extracts

– Antifungal activity of Egyptian Propolis.

Fungi	MIC (mg/ml.)	inhibition (in mm)
Mucor	20	18± 1
Penicillum	23	26 ±2
A.flavus	10	32 ±3
A.niger	15	26 ±4
A.fumigatus	20	21 ±2
A.parasiiiticus	30	24 ±2

Antifungal activity



- Hegazi et al., (1997) determined the influence of the geographic zone on antimicrobial activity of Egyptian propolis. The minimum inhibitory concentration (MIC) of ethanolic extract of Egyptian propolis (EEP) was determined against *Aspergillus niger and Candida albicans*.

Antifungal activity

- The results revealed that the optimum concentration of Egyptian propolis that induced the greatest visible inhibition of yeast and fungal growth was varied according to the type of pathogen and the geographic zone.



Antifungal activity



- Salem et al., (1997) found that the ethanolic extract of propolis inhibited :
- Candida albicans CAIM 22
- Saccharomyces cerevisiae CAIM 14

Antifungal activity

- Shaeb et al., (1997) tested propolis on four genera of dermatophytic fungi:
- Trich. viulaceum;
- T. schoenleinii,
- M. canis and
- Epid. floccosum.
- An inhibitory effect of propolis was seen on 50 % of the tested fungi.

Antifungal activity

- Hegazi and Abd El Hady (2000) determined the antifungal activity of Egyptian propolis against :

Antifungal activity

*Cladosporium
*Mucor
*Asprgillus
*Alternaria
*Rhodotyrlla

- Scopulariopsis
- Penicillium
- Rhizopus
- Fusarium

Antifungal activity

- The results revealed that Egyptian propolis induced inhibition of fungal growth. This inhibition varied according to the type of fungi.

Antifungal activity

- The minimal inhibitory concentration of propolis ranged from 1,20 – 3.60 mg /ml. It was obvious that the minimum inhibitory concentration was 3.60 mg / ml for Alternaria and Fusarium whereas the concentration (1.20 mg / ml) was recorded for Asprgillus and Penicillium.

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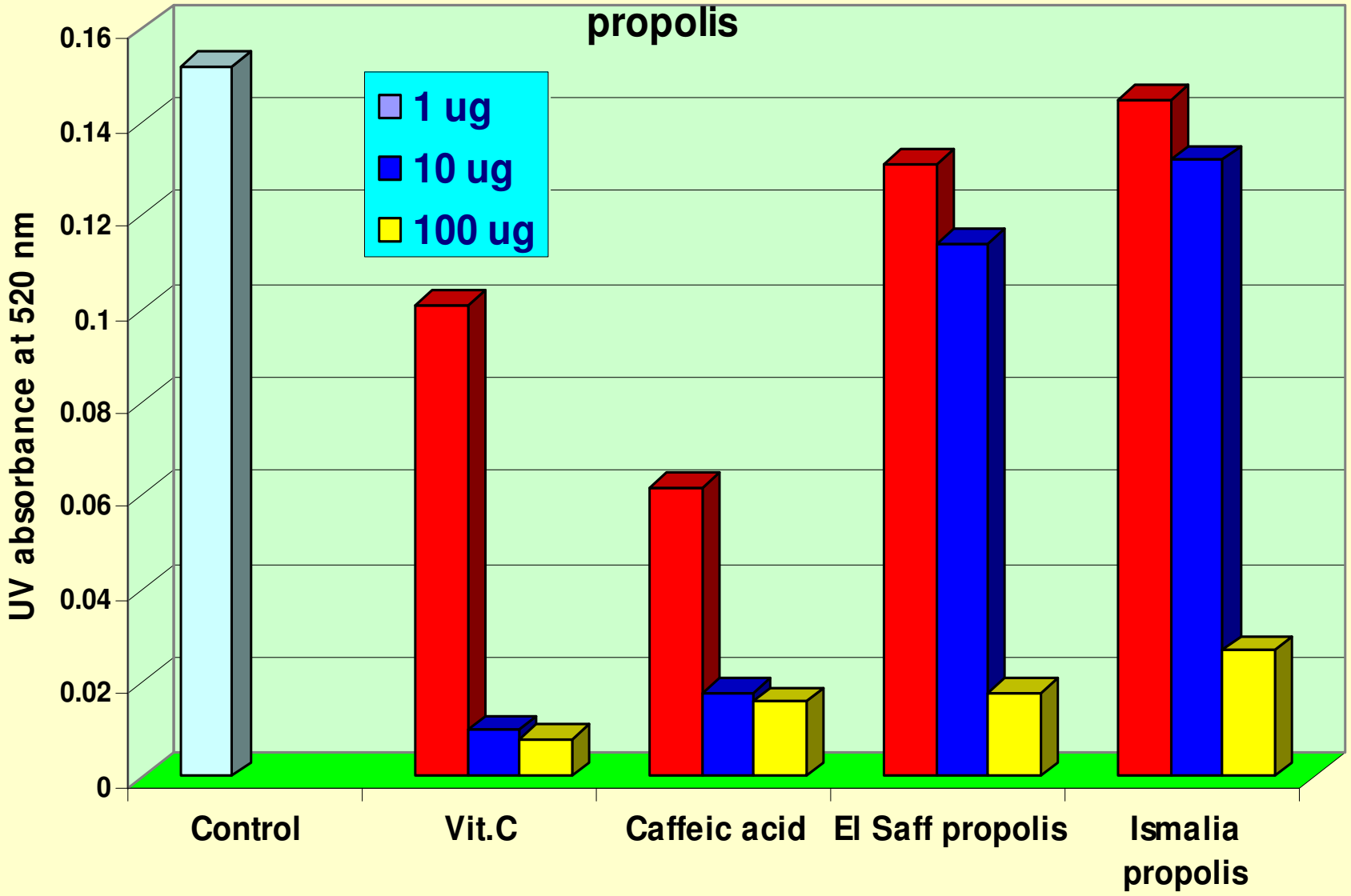
Antioxidant activity

Hegazi and Abd El Hady (2001) studied The free radical scavenging effect of two propolis samples collected from Reclaimed land, Egypt as well as vitamin C and caffeic acid in DPPH free radical system was determined.

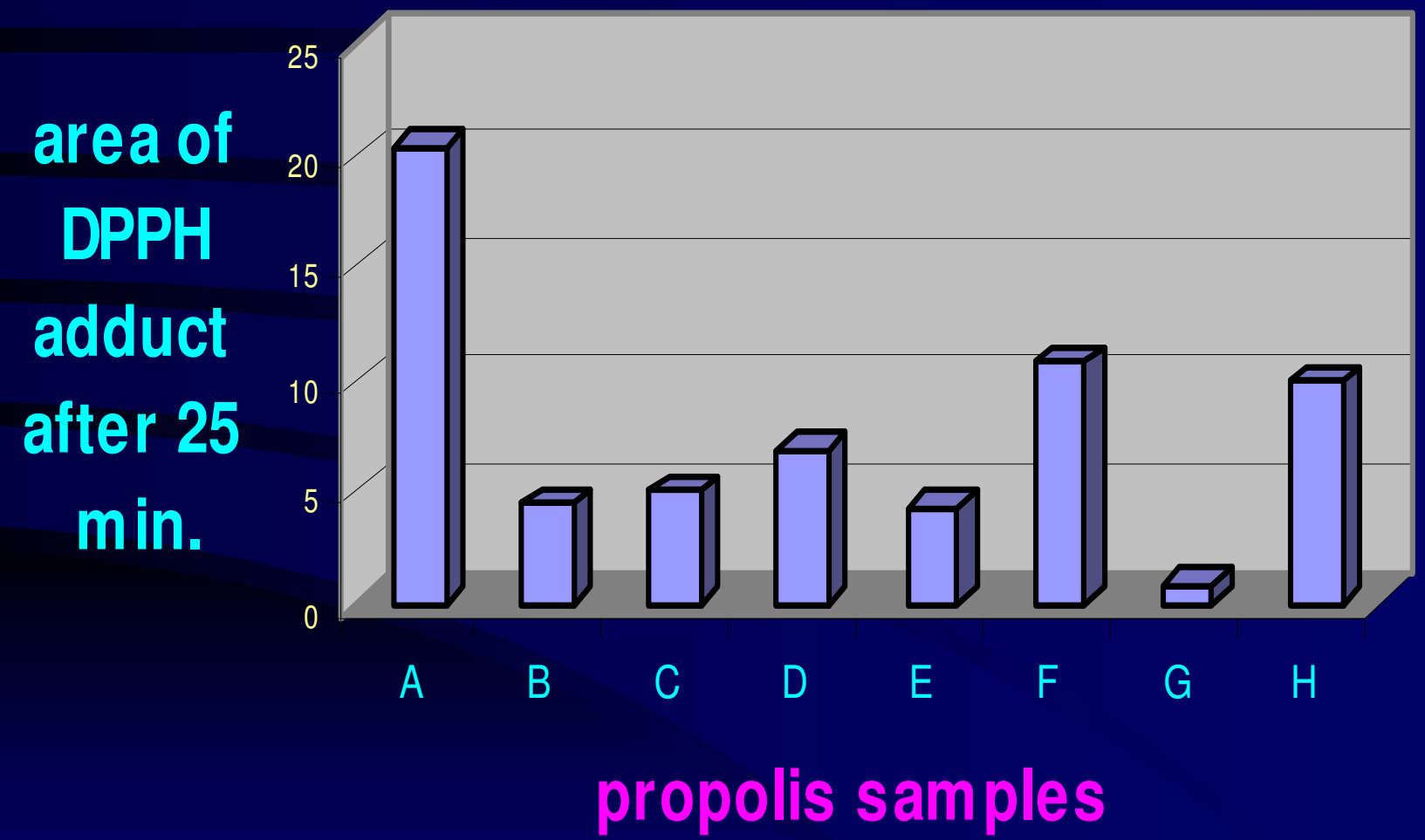
Antioxidant activity

The results of the free radical scavenging effect of El-Saff and Ismalia propolis showed a concentration-dependent activity. The antioxidant activity was varied according to the examined material. It was obvious that caffeic acid and vitamin C showed the highest activity if compared with the propolis samples. El- Saff propolis had a higher antioxidant activity than Ismalia propolis

Fig. I : The DPPH free radical scavenging effect of Egyptian propolis



Antioxidant activity of propolis samples



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  - Antioxidant activity
  - Ophthalmology

- Ophthalmology

Congested eye







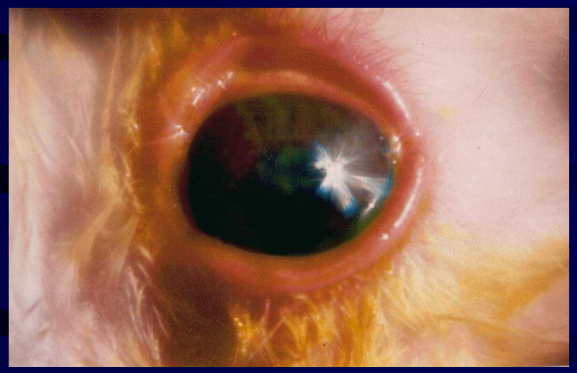


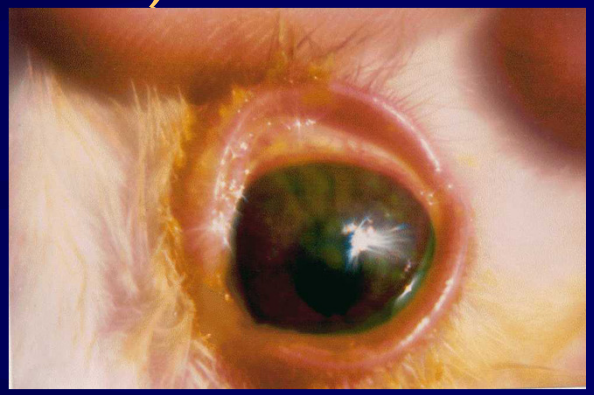
5 days



7 days

herpes virus)





Typical dendritic lesion day 1 p.I.



Typical geographical ulcer 3day p.i



Complete cure (clear cornea) 7 day treatment with honey

Before







After





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VETERNIARY ASPECTS OF APITHERAPY IN EGYPT



Thank you

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