



RAW PROPOLIS

Raw Propolis



- Ancient Medicine

Propolis was used throughout the ancient world by various civilizations, with applications ranging from perfuming to curing wounds and skin diseases.

" [P r o p o l i s i s] t h e c o m b s ; b y m e a n s o f i t a l l o n e s a r e s t o p p e d e h o n e y u p , w h i c h m i g h t , o t h e r w i s e , s e r v e f o r t h e a d m i s s i o n o f c o l d o r o t h e r i n j u r i o u s i n f l u e n c e s . . . "

" [p r o p o l i s] h a s t h e p r o p e r t y o f e x t r a c t i n g d i s p e r s i n g t u m o u r s , r i p e n i n g i n d u r a t i o n s , a l l a y i n g p a i n s o f t h e s i n e w s , a n d c i c a t r i z i n g u l c e r s o f t h e m o s t o b s t i n a t e n a t u r e . "

(Pliny the Elder – Roman Historian)

Its therapeutical effect along with the function it performs in the beehive were what defined the substance propolis.

Raw Propolis



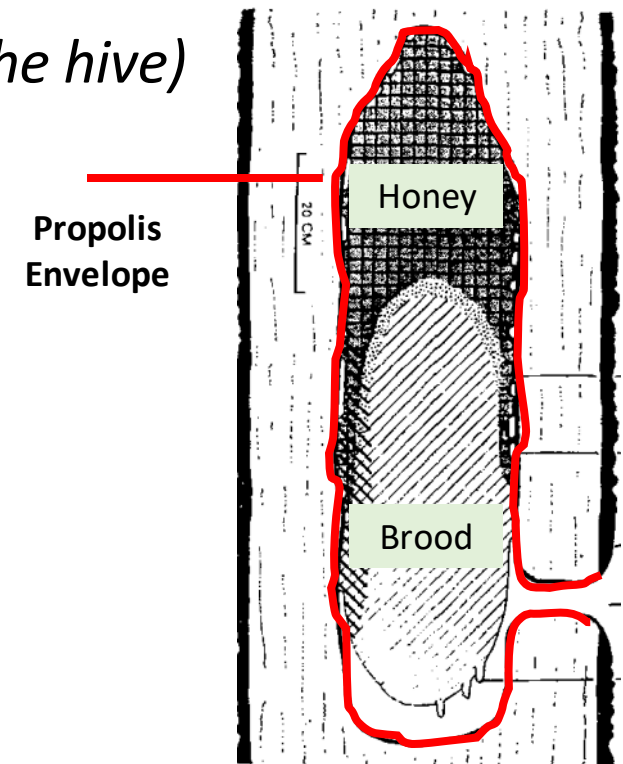
- Ancient Medicine

From Greek, **PROPOLIS** can mean for the *defense of the city (or the hive)*

In feral colonies, the honeycomb is enveloped by propolis

Working description: propolis is a resinous material (brittle when cold, soft when warm) made by bees to build and protect the hive – **an animal derived product**

Diagram of honeybee nest, inside of a tree.



Seeley and Morse 1976

Raw Propolis

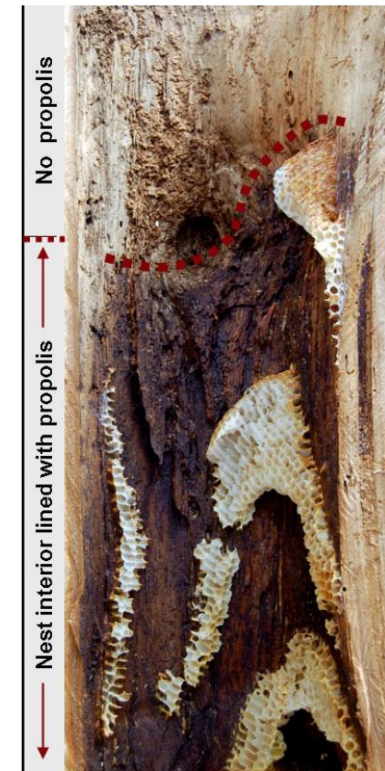


• I n t h e b e e h i v e ...

Honeybees are social insects that rely on collective behavioral defenses, as listed next, that produce a colony level immunity system.

- Grooming nestmates;
- Detection and removal of diseased brood;
- Antimicrobial secretions (e.g. spread of venom on bee's cuticles);
- Social fever
- Selective collection and in-hive use of antimicrobial plant resins

Adding to our working description: the base material for the creation of propolis are resins collected by bees from plants, bushes, trees, etc. – the surrounding vegetation.



Raw Propolis



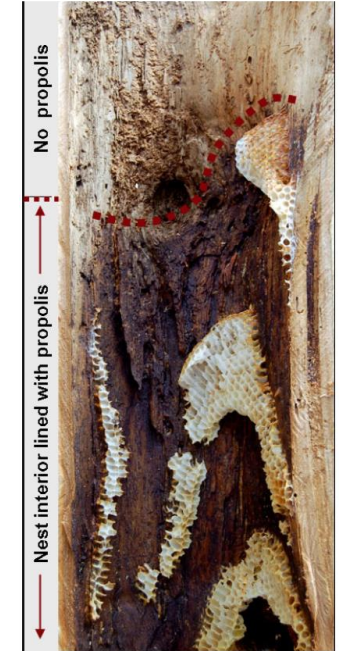
• I n t h e b e e h i v e ... Propolis benefits and function

- Structural
 - Block holes and cracks;
 - Repair combs;
 - Regulate humidity and heat exchange;
- Hygienic/Immune
 - Prevent decay of intruders
 - Protect hive from fungal and bacterial infection

Mouse skull encased in propolis



– Simone-Finstrom & Spivak 2010



Securing comb attachment location with propolis. Rim coated with propolis.

Raw Propolis



• I n t h e b e e h i v e ... Propolis benefits and function

- There is a more subtle benefit than from the direct defense against parasites and pathogens

An elevated immune response has an associated fitness cost (e.g. reduced colony productivity and individual survival)

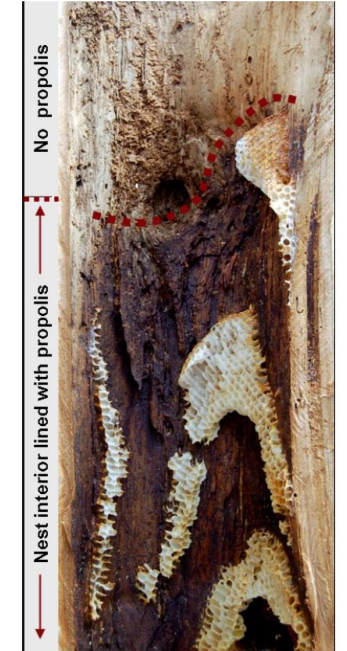
Colonies enriched with propolis have a significant lower expression of immune-related genes when compared to control groups.

– Simone-Finstrom & Spivak 2010

Mouse skull encased in propolis



– Simone-Finstrom & Spivak 2010



Securing comb attachment location with propolis. Rim coated with propolis.

Raw Propolis

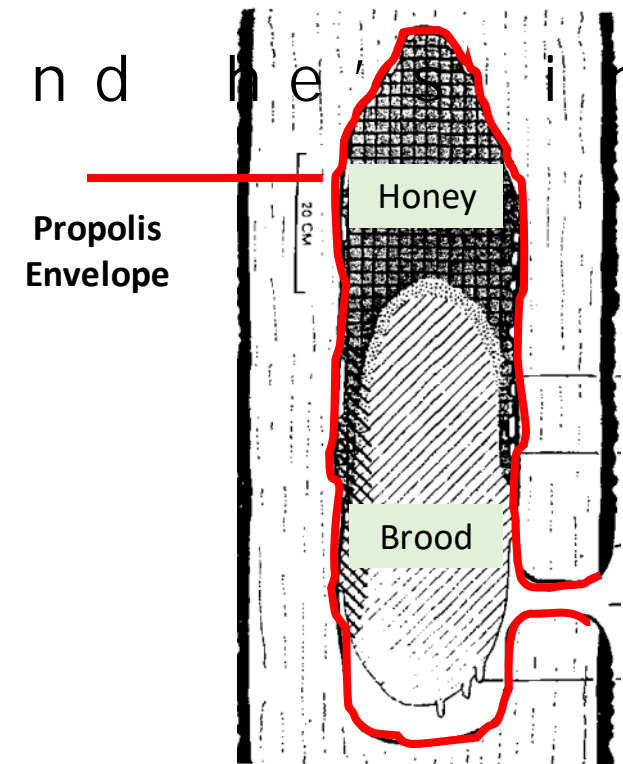


- Question!

Situation: a customer comes in and he asks for a product from the beehive that will effectively improve his immunity.

Based on what you have seen so far, why propolis should be the first option?

Diagram of honeybee nest, inside of a tree.



Seeley and Morse 1976

Raw Propolis

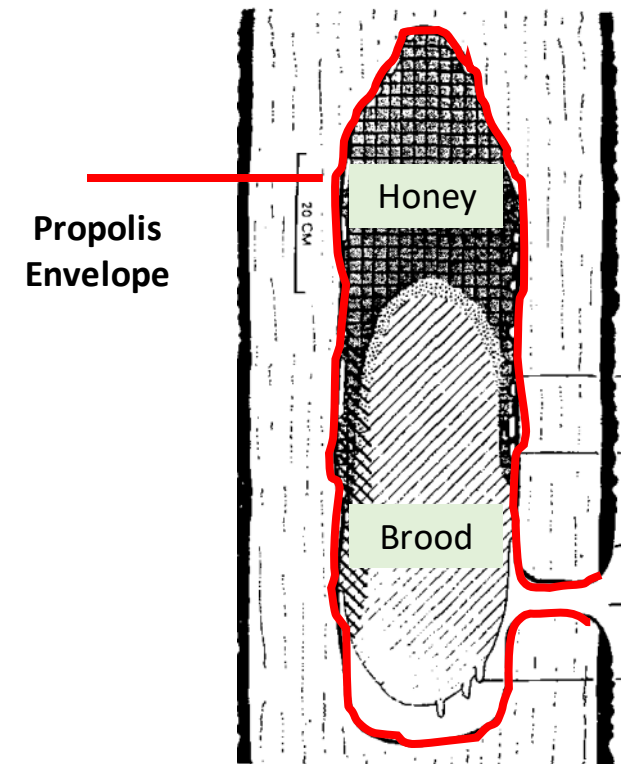


- Answer!

Propolis is purposefully created by bees with the primary goal of protecting their hive against decay and microbial agents.

This is not the case for Honey, Royal Jelly and pollen, whose primary objective is of feeding the hive. In the first two cases, sugar content is quite high (60-80%).

Diagram of honeybee nest, inside of a tree.



Seeley and Morse 1976

Raw Propolis



- Modern Understanding

The scientific interest on propolis **began at the end of the 19th century**, with a significant **and a** ignited by its use in the supplement and pharmaceutical industry

In the 1960s, propolis was thought to be of very complex, but somewhat constant chemistry, like beeswax or bee venom. **However:**

Propolis's chemical composition depends on *specificity of the local flora at the site of collection and thus on the geographic and climatic characteristics of this site.*

- Bankova, 2005

Typical overall composition of propolis

Compound	Composition Range (%)
Resins and aromatic balsams	50-60
Wax	30-40
Essential oils	5-10
Other substances	5

Raw Propolis



- Modern Understanding



To compare propolis from different regions of the world such as China and Brazil might be the same as comparing extracts from two plants that belong to different families.

Botanical Source - *The plant origin of propolis determines its chemical diversity.*

– Bankova, 2005

Raw Propolis



• Brazil

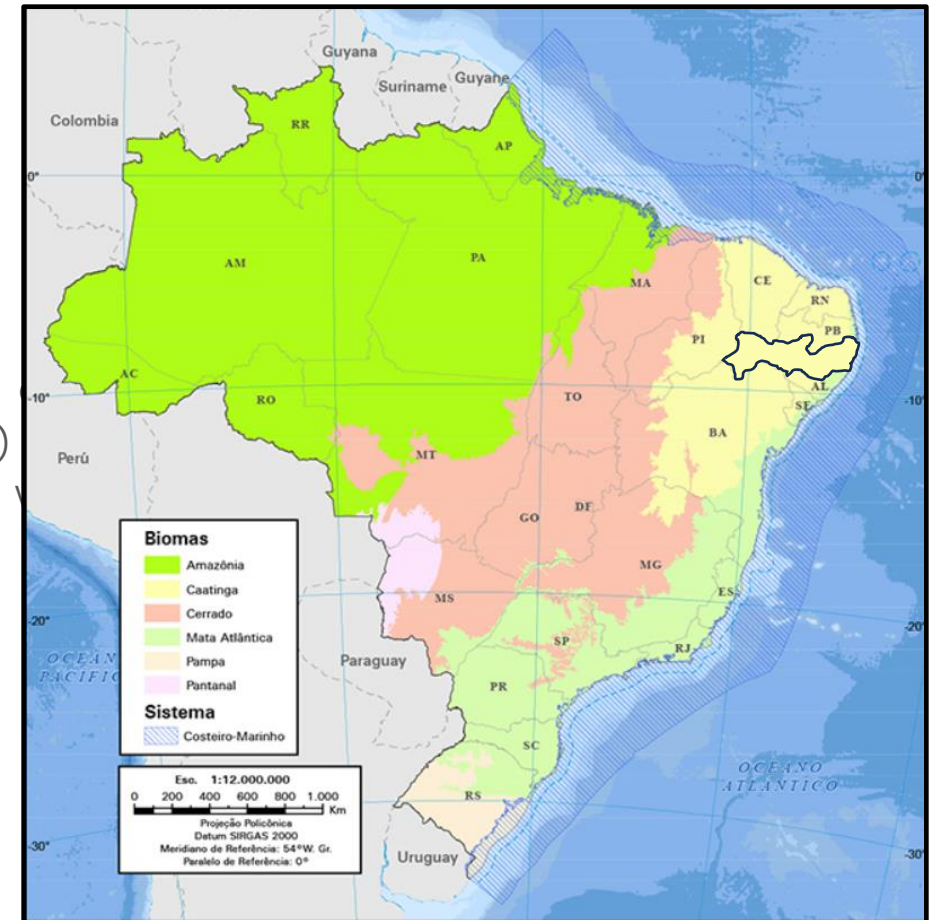
- The 5th country in land area
- Accounts for 17% of the tropics terrestrial land
- Encompass 5 biomes
 - Largest rainforest: Amazon (bright green)
 - Atlantic forest (green)
 - Cerrado " Savannah " (light red)
 - Pantanal " Wetlands " (purple)
 - Caatinga " Semiyellow north "
 - Pampas - " low grassland " (yellow)
- 11.6% of the planets plant species
- 20% of freshwater fish
- 17% of all birds are found in the country



*More than **12 types** of propolis have been distinguished in Brazil.*

- Park, 2002

Brazilian Biomes



Raw Propolis



- Brazil

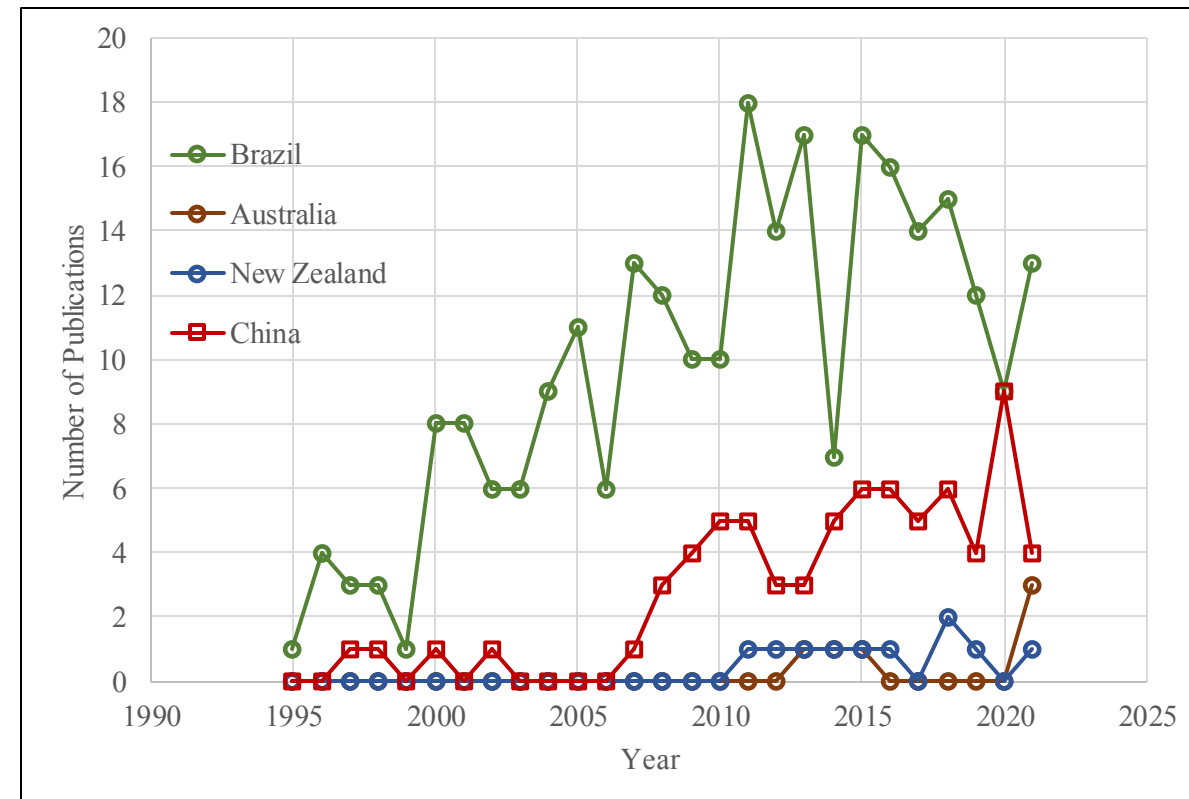
The Brazilian ecosystem enables the production of a propolis that is:

1. Rich (with significant pharmacological properties)
2. Diverse (with more than 12 types of propolis)
3. Pure/clean – (biomes with low human interference, low in contamination)



That is why Brazilian propolis is the best raw material.

Scientific Interest on Brazilian propolis publications on PubMed



Raw Propolis



- Question!

Situation: a customer comes in and says he is interested in knowing the difference between NaturaNectar products and another one.

Based on what we just discussed, what could be an important difference?

Raw Propolis



- Answer!

An important difference could be that NaturaNectar only uses Brazilian propolis, which is:

Most companies do not disclose the origin of their propolis customer receives a generic propolis.



Attention: Disclosure of **propolis origin** is a top propolis product characteristic.

Can you identify on the product where the origin is disclosed in NaturaNectar's

Raw Propolis



- Question!

***Situation:** our customer hears you say that NaturaNectar uses Brazilian propolis, but looks confused at you and asks: why does it matter?*

Based on what we just discussed, what could you reply?

Raw Propolis



- Answer!

Different origins mean different chemical composition, which affects the properties of the final product

- *Brazilian propolis is the most scientifically investigated in the world for its health benefits and pharmacological properties*
- *Brazilian isolated and protected biodiversity makes the propolis clean and free of contaminants*
- *Brazilian rich biodiversity and continental size allows for the emergence of a diverse number propolis types, with varied health benefits*

Raw Propolis



• Brazilian Green Propolis (BGP)

In the 80's, the Japanese discovered Brazilian green propolis (" the Brazilian propolis ")

Produced in the Southeastern region of Brazil, more specifically in Minas Gerais (MG) state, which is the largest propolis producer in Brazil.

MG is responsible for 70% of all propolis production in Brazil of the total estimated of 120 tons per year.

85% of that production is of green propolis.

BGP accounts for 80% of all the propolis consumed in Japan.

It is regarded as the highest quality propolis in Japan

- Pharmacological properties (rich in phenolic acids - **Artepillin-C**)
- Sensory/organoleptic properties
- Low contamination levels (heavy metals and other pollutants)

Green resin on bees back legs



Botanical Source:

Baccharis dracunculifolia



Raw Propolis



• Brazilian Red Propolis (BRP)

Brazilian Red Propolis – the foundation of NaturaNectar.

Produced in Northeastern region of Brazil, more specifically in the mangroves of Alagoas state.

Our late co-founder Alessandro Esteves was part of the team that discovered the botanical of Brazilian red propolis.

Original Article

Chemical Composition and Botanical Origin of Red Propolis, a New Type of Brazilian Propolis

Bruno B. Silva¹, Pedro L. Rosalen¹, Jaime A. Cury¹, Masaharu Ikegaki², Vinicius C. Souza³, Alessandro Esteves⁴ and Severino M. Alencar³

¹Piracicaba Dentistry School (FOP/UNICAMP), Department of Physiologic Science, C.P. 52; Zip-code: 13414-903, Piracicaba, SP, ²Federal University of Alfenas; Zip-code 37130-000, Alfenas, MG, ³College of Agriculture 'Luiz de Queiroz' (ESALQ/USP), C.P. 9; ZIP-CODE: 13418-900, Piracicaba, SP and ⁴Apiários Almar e Essencial LTDA, Maceió, AL, Brazil

Red propolis is a new type of Brazilian propolis. This material, as well as the secretions of 20 plant species that are often mentioned as its probable botanical source, have been investigated by RP-HPTLC. Phytochemical evidence based on UV-VIS spectra, RP-HPLC and GC-MS, showed *Dalbergia ecastophyllum* (L.) Taub. to be the main source of red propolis in Alagoas state. The propolis and plant resin showed high relative percentages of the isoflavonoids 3-Hydroxy-8,9-dimethoxypterocarpan and medicarpin. To our knowledge this is the first report of the secretion of a leguminous species being the source of propolis.

Keywords: *Dalbergia ecastophyllum* – isoflavonoids – plant resin – red propolis

Bee collecting red resin from *Dalbergia ecastophyllum*



Botanical Source: *Dalbergia Ecastophyllum*



Raw Propolis



- BRP is an exotic propolis!
 - It is the only propolis whose botanical source is a leguminous plant species
 - It has a unique flavonoid composition, specifically isoflavonoids, with chemical marker: **Formononetin**
 - It comes from a restricted (difficult access) area of production – Brazil Northeast mangroves

Bee collecting red resin from *Dalbergia ecastophyllum*



Botanical Source:
Dalbergia
Ecastophyllum



Raw Propolis



- **Brazilian Red Propolis (BRP)**

Recent research confirmed that this jewel beetle is a **red propolis production inductor**.

Red resin is released as a result of the exit hole produced by the adult beetle leaving the stem.

Bees collect the resin afterwards to protect their hive.

rare, unique, exotic!



Bee collecting red resin from *Dalbergia ecastophyllum*



Botanical Source:
Dalbergia
Ecastophyllum



Newly discovered beetle, present in Northeast of Brazil



Raw Propolis



- Brazilian Red Propolis (BRP) – we are present at the very beginning!

- Quality from the source!

Being in Brazil means that we have expertise not only with red propolis, but to source any Brazilian propolis.



Raw Propolis



- The genetics



Two hives not more 2 meters apart producing propolis of different quality.



The hive genetics is a relevant factor contributing to the production of propolis.

Only someone at the source can identify and sort out this type of problem, precluding it from entering the system.

Raw Propolis



- Brazilian Brown Propolis

Brazilian Brown Propolis is the second most produced propolis in Brazil

Produced in the South region of Brazil, specifically in the Paraná (PR) state, where beehives are exposed to different biomes

Brazilian pines (Araucarias) are one of the botanical sources for this type of propolis, conferring presence of anti-inflammatory oils – **terpenes** to it.

The varied botanical source makes it present a diverse chemical composition, with compounds characteristic of BGP (**Artepillin-C**) to ones that characteristic of European propolis (**CAPE** **caffeic acid phenethyl ester**)

Bee collecting brown resin from *Araucaria angustifolia*
- Ribeiro, 2023



Varied Botanical Source:

Araucaria angustifolia, *Pinus* spp., *B. dracunculifolia*, *Eucalyptus* spp.



Viviane Monconduit



Germano Roberto Schüür

Raw Propolis



- Question!

Are all propolis the same?

Raw Propolis



- Answer!

NOT AT ALL!

- *In summary, propolis type, quality and production depend on:*
 - *Genetics*
 - ***Botanical Source***
 - *Climate*
 - *Environmental interaction (ecosystem)*
 - *Human Presence*