

The background of the slide features a large, bright sun on the left side, partially obscured by a magnifying glass. On the right side, there is a close-up of a ruler with yellow and red markings. The text is centered on a light yellow background.

# **Propolis standard: Update**

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**IHC Group "Standards for bee  
products other than honey"**



**Work group "Propolis"**

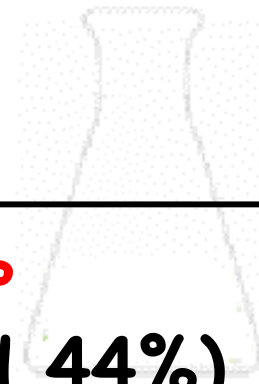
**Tzarevo 2008**

# What is new@propolis group



- New values for the lower limits of active constituents in Poplar type propolis, correlation with biological activity.
- Correlation between total phenolics and biological activity in Brazilian propolis.
- Mechanical impurities - method, suggested limits
- Water content - method, suggested limits
- **Attention** - New Propolis Types!

# Poplar type propolis



- **New** minimal values based on statistics (20 percentile) for 114 poplar samples from all over the world

<b>Resin</b>	<b>45%</b> (Old 44%)
<b>Phenolics</b>	<b>21%</b> (Old 19%)
<b>Flavones</b>	<b>4%</b>
<b>Flavanones</b>	<b>4%</b>

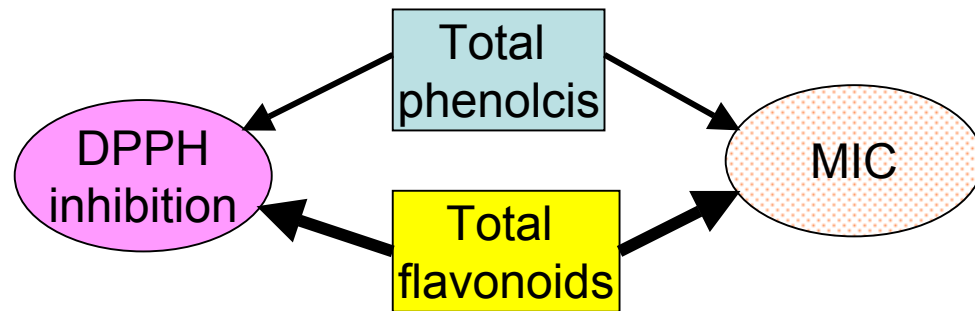
# Poplar type propolis

- **Statistically significant negative** correlation between the concentration of total phenolics and MIC: the **higher** the concentration, the **lower** the MIC (over 110 samples).
- **Statistically significant positive** correlation between the concentration of total phenolics and the antiradical activity against DPPH (Chinese poplar propolis, 16 samples)\*
- **No significant correlation** of antiradical activity with total flavonoid concentration\*

# Brazilian propolis



- 49 samples from different states, undefined plant origin



- A similar study needed with clearly defined propolis type (plant origin)

# Mechanical impurities - method

Suggestion: undissolved matter after extraction of waxes according to Woisky&Salatino (chloroform, Soxhlet), followed by Soxhlet extraction with ethanol



# Mechanical impurities - values



Based on 20 samples of poplar origin:

Mean value:  $4 \pm 2$

Minimum value 2.2

Maximum value 8.8

Data from Allwex company, Germany: maximum 5%

**Suggested** value for Specification: maximum **5%**

# Water content

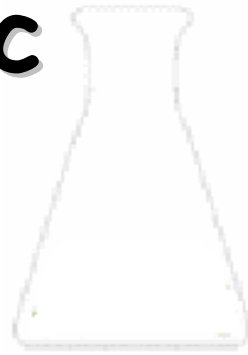


**Suggested unified procedure: gravimetric drying of powdered propolis for 2 h to constant weight in a conventional kiln at 105°C**

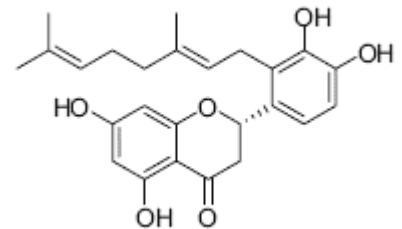
**Suggested value for Specification: maximum 8%**



# New Propolis Types: Pacific propolis



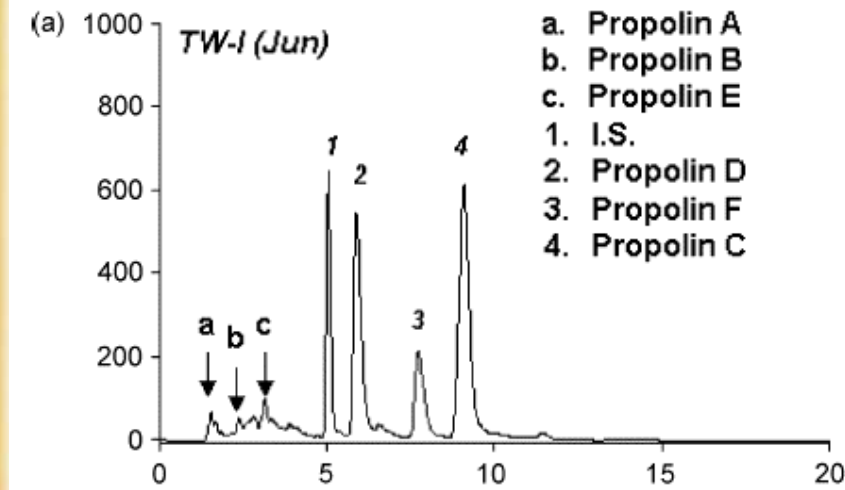
- Geographic origin: Okinawa, Taiwan, Indonesia
- Main constituents: C-prenylated flavanones (propolins)
- Plant origin: *Macaranga tanarius*
- Proved activities: antioxidant, antimicrobial, induction of apoptosis



# New Propolis Types: Pacific propolis



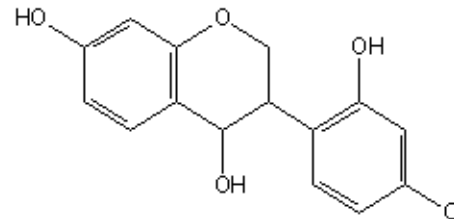
- HPLC profile of Taiwanese propolis



- Total phenolics content might be used for standardization, although data is yet insufficient

# New Propolis Types: red propolis

- Geographic origin: Cuba, Brazil
- Main constituents: isoflavonoids



- Plant origin: *Dalbergia ecastophyllum*



- Proved activities: antimicrobial, antioxidant, cytotoxic

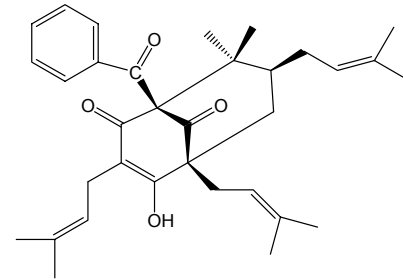
Trusheva et al., eCAM 3 (2006), 249

Silva et al., eCAM Advance Access published on July 7, 2007; doi:10.1093/ecam/nem0

Alencar et al., J. Ethnopharmacol. 113 (2007) 278;

# New Propolis Types: *Clusia* propolis

- Geographic origin: Cuba, Venezuela, Brazil
- Main constituents: prenylated benzophenones



- Plant origin: *Clusia* spp.



- Proved activities: antimicrobial, antioxidant, cytotoxic

Trusheva et al., *Fitoterapia*, 75 (2004) 683

Cuesta-Rubio et al., *J.Agr.Food.Chem.* 55 (2007) 7502

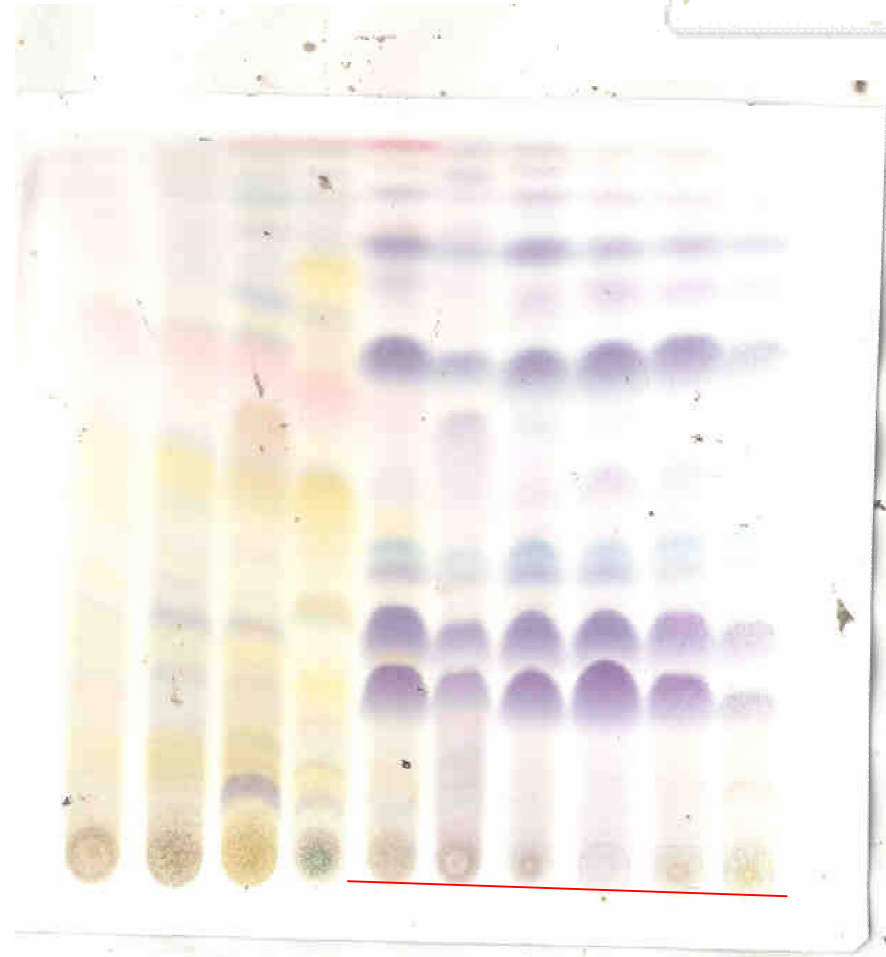
# Suggested markers for new propolis types



Propolis type	Taxonomic markers	Identification
Pacific propolis	Prenylated flavanones (propolins)	HPLC, TLC
Red propolis (from <i>Dalbergia ecastophyllum</i> )	Isoflavonoids: medicarpin, vestitol, formononetin	HPLC, TLC
<i>Clusia</i> propolis	Prenylated benzophenones (nemorozone, guttiferone E, xanthochymol)	HPLC, TLC

# European propolis of **non-poplar** origin

- Mediterranean region
- Main constituents: diterpenes
- Plant source: unknown
- Proved activities: antimicrobial, cytotoxic



# What comes next ?

- To confirm correlation between activity and total phenolics and total flavonoids in Brazilian green propolis using statistic methods
- To propose parameters for Brazilian and Cuban red propolis: Commercial interest growing!
- To propose parameters for Pacific propolis: emerging commercial interest.



# Thank you for your attention!

