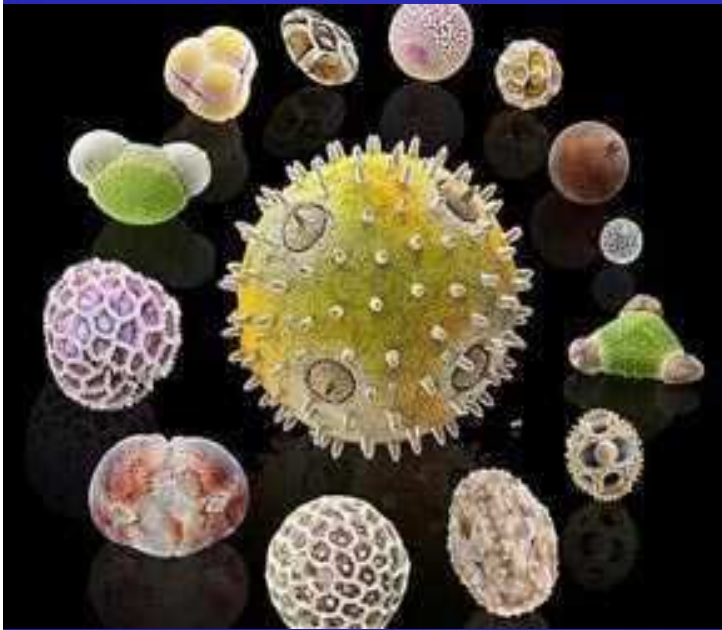
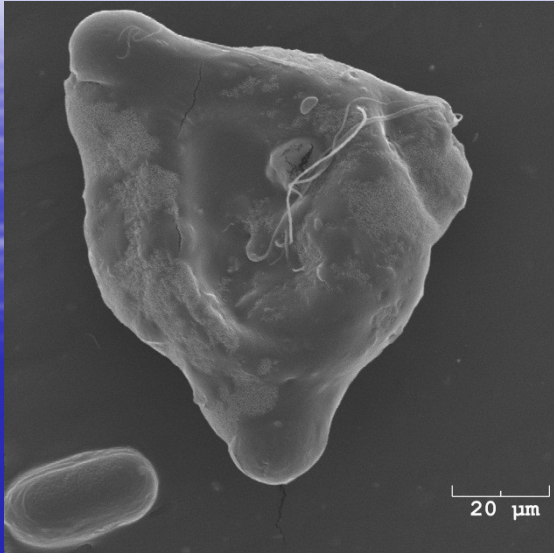


The Role of Melissopalynology in the Honey Market

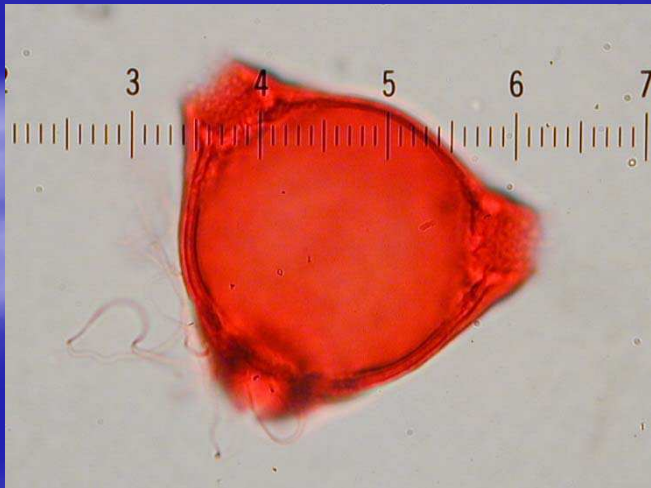
**By Stephen Petersen (Apicultural consultant)
& Dr. Vaughn M. Bryant
(Melissopalynologist Texas A&M University)**



What is Melissopalynology?



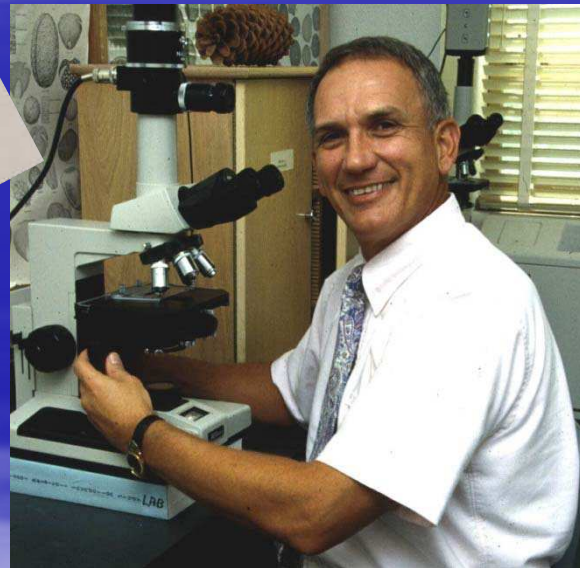
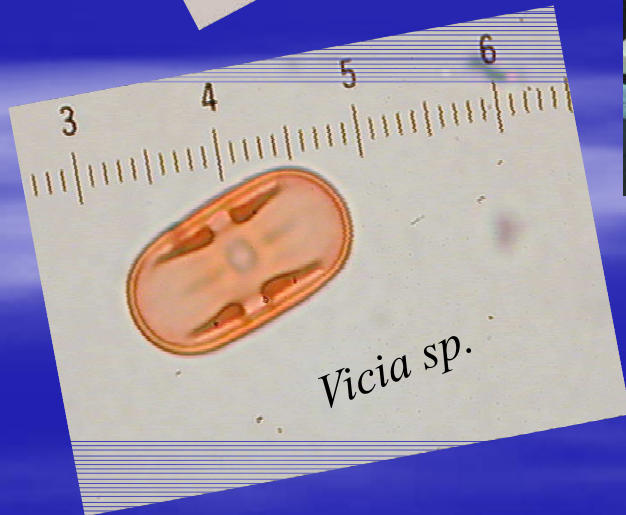
SEM photograph courtesy of Tina Buxbaum, UAF



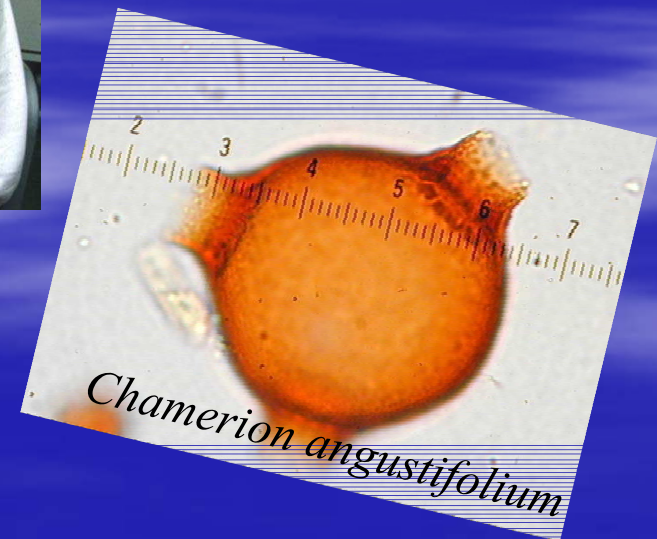
LM photograph courtesy of Vaughn Bryant, Texas A&M

- **Melissopalynology is the microscopic study of pollen in honey. It can –**
 - Provide information on the nectar plants visited by foraging bees.
 - Provide a geographical origin of the honey.
 - Certify unifloral honeys.

Microscopic Identification of Pollen Grains

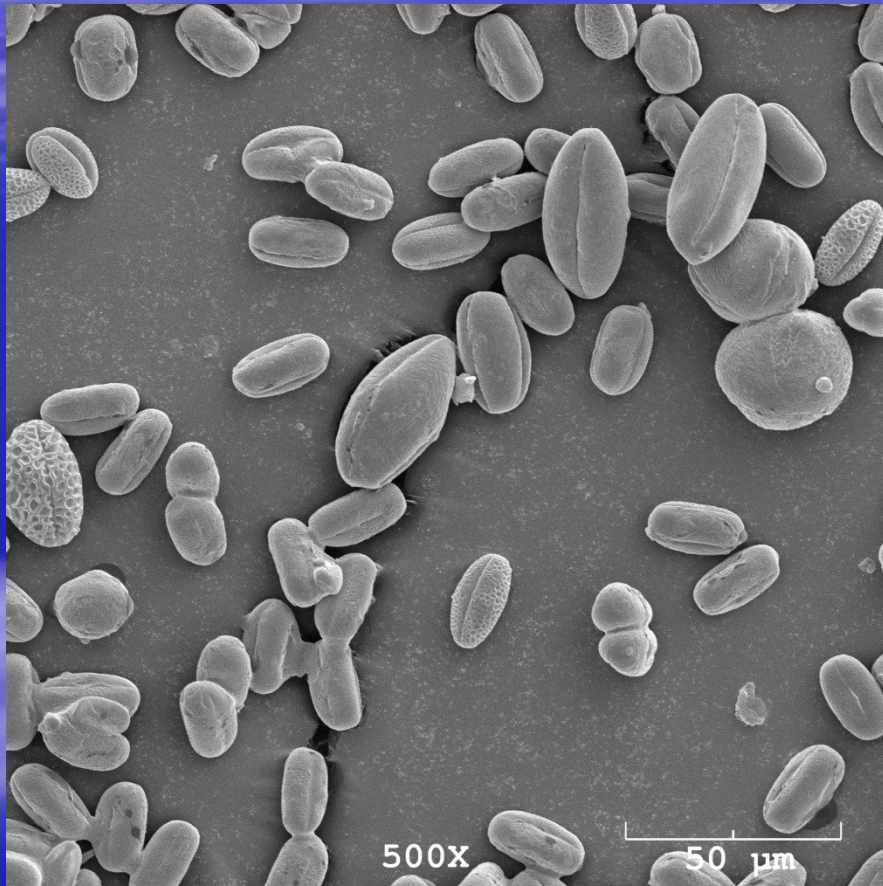


**Melissopalynologist
Dr. Vaughn Bryant,
Texas A&M University**



LM photographs courtesy of Vaughn Bryant, Texas A&M

What are the limitations to pollen analysis in honey?



SEM photograph courtesy of Tina Buxbaum, UAF

- There must be a botanical reference (pollen) collection of the important bee forage in the region.
- There must be trained personnel in laboratory and pollen identification procedures.
- There must be well researched values for pollen coefficients.

What are Pollen Coefficients?



- The concentration of a representative floral pollen in honey is dependent upon several factors:
 - Structure of the flower.
 - Size and shape of the pollen grain.
 - How long it spends in the bee's honey stomach.
- These factors lead to pollen being “under-represented” (e.g. fireweed) or “over-represented” (e.g. forget-me-not).

What are the advantages and pitfalls to melissopalynology?

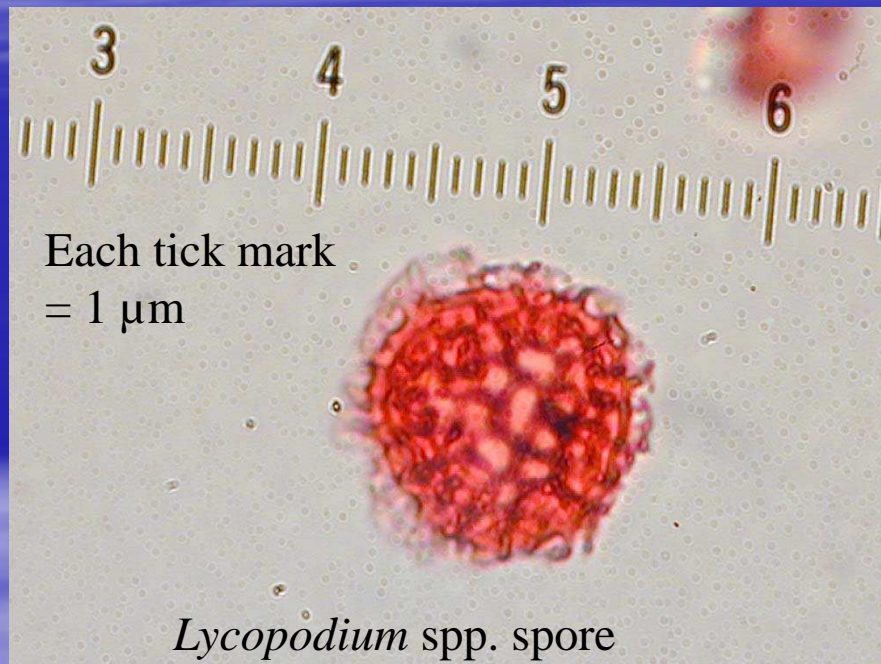
■ Advantages –

- Typically used to identify high value unifloral honey – e.g. *sidr* or *manuka*.
- Frequently can determine where a honey is not from geographically – e.g. eucalyptus pollen in purported English heather honey.

■ Pitfalls

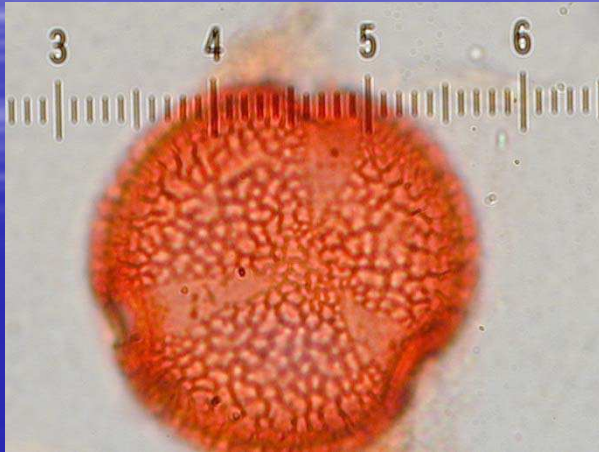
- Impossible to do if honey has been filtered to remove anything down to 5µm.
- Few pollen coefficients have been established for important honey plants.
- Botanical ranges do not necessarily coincide with political boundaries.

Melissopalynological Procedures

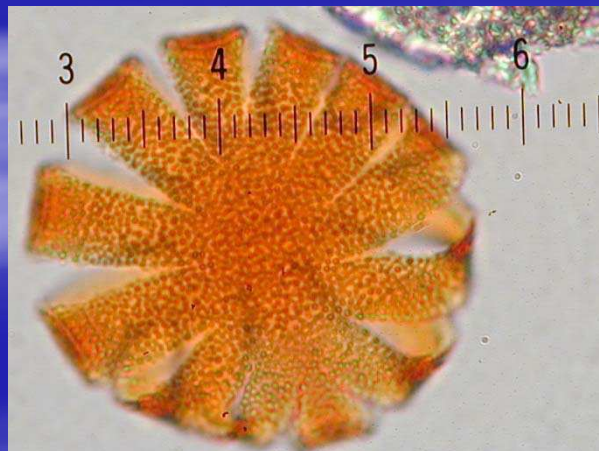


- A sample of about 10 grams of honey is necessary- it is heated and diluted with warm water and ETOH (alcohol).
- The sample is acetolized using strong acids and chemicals; this removes all proteins leaving behind the exine – the almost indestructible pollen casing.
- A known number of *Lycopodium* spores are added to assist in the counting- ratio calculations.

Melissopalynological Procedures



Citrullus lanatus - Watermelon



Sesamum spp. - Sesame

- A trained palynology technician identifies the pollen grains using a light microscope - normally at 400X , but sometimes 1000X is necessary.
- With an excellent pollen reference slide collection, some indication of possible pollen/nectar sources or geographic origin is possible. Pollen may be identified easily as to family, frequently to genera and sometimes (with unique pollen grains) to species.

An example of successful marketing



\$49.99

250 grams of pure Yemen Sidr Honey



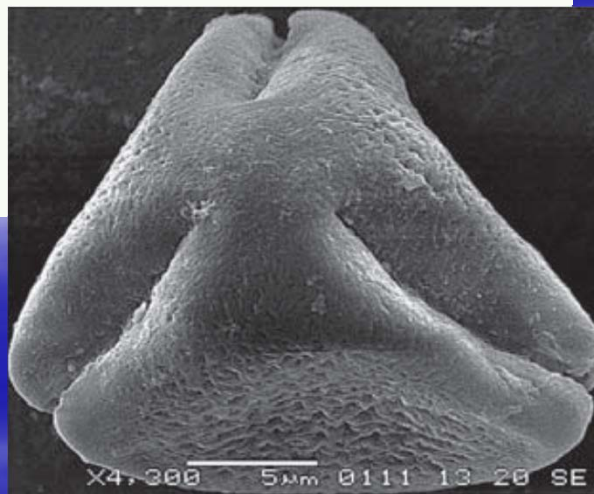
\$89.99

500 grams of pure Yemen Sidr Honey



\$159.99

1000 grams of pure Yemen Sidr Honey



- *Sidr* honey comes from the thorny tree *Ziziphus spina-christi* that grows wild in the middle-east and the horn of Africa.
- Yemen and Oman are centers for the production of this type of honey primarily using *Apis mellifera jemenitica* bees.
- It commands a premium price (\$160-\$200/kg.) throughout the Gulf region.

SEM photograph courtesy of Alia Sajwani, Sultan Qaboos University, Oman

How do you know the honey is what it is claimed to be? (*caveat emptor* – buyer beware)



- **Organoleptic characteristics**
 - Color, taste, smell, viscosity (e.g. thixotropic)
- **Physio-chemical characteristics**
 - HMF, sugar ratios, electrical conductivity, diastase activity etc.
- **Pollen analysis**
 - Pollen cannot have been ultra-filtered out.
 - Must have pollen reference slides on hand.

Perceptions and Labels



Borneo – Certified Organic



Lao - Organic



**U Minh Forest Honey
(Vietnam) on sale in
Cambodian supermarket**

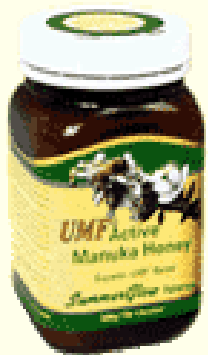


Lao - Market

**Rwandan
honey from
gorilla preserve**



Manuka honey is one of the few honeys subject to continual scientific scrutiny, it is also the child of a successful marketing campaign.



SummerGlow UMF16+ Manuka Honey

High activity pure honey, suitable for various therapeutic applications or as a delicious healthy food. 500g (1lb 1.6 oz).

\$ 39.90

[More Info](#)



SummerGlow Sterilized UMF16+ M

Specially developed for wound care. 200g (7oz).

\$ 30.00

[More Info](#)

It must be true - I read about it on the internet!

UMF Manuka Honey Has Unsurpassed Healing Qualities

"Within three days the spot was free from infection and healing nicely." (Marilyn, NZ) [More...](#)

Exceptional Antibacterial and Healing Activity



The unique properties of UMF manuka honey can help heal a huge range of conditions from stomach ulcers to infections, as well as increasing your energy levels and general well-being. [More Information...](#)

Genuine UMF16+



"UMF" is the property which gives active manuka honey its special healing quality. UMF manuka honey with a rating of 16+ has the highest level of antibacterial activity, giving you faster, more reliable results. [More Information...](#)

Completely Natural



We sell 100% natural honey products from the unspoiled countryside of New Zealand. Strict quality control and intensive hive management ensure that the manuka honey you use is as pure as possible. [More Information...](#)

Supported by Research



Extensive research and clinical trials at universities and hospitals have demonstrated the power of UMF active manuka honey. The benefits have been documented, so you can buy with confidence. [More Information...](#)

UMF Manuka Honey can help...



[Stomach ulcers](#)

[Sore throats & colds](#)

[Skin ulcers, wounds, boils](#)

[Burns & pressure sores](#)

[Infections & MRSA](#)



[Click here to purchase now!](#)

TV Commercial
(30 Second Video)



Windows Media: [56K](#) [128K](#)

Real Media: [56K](#) [128K](#)

Quicktime: [56K](#) [128K](#)

Is this the honey equivalent of a Rolex?



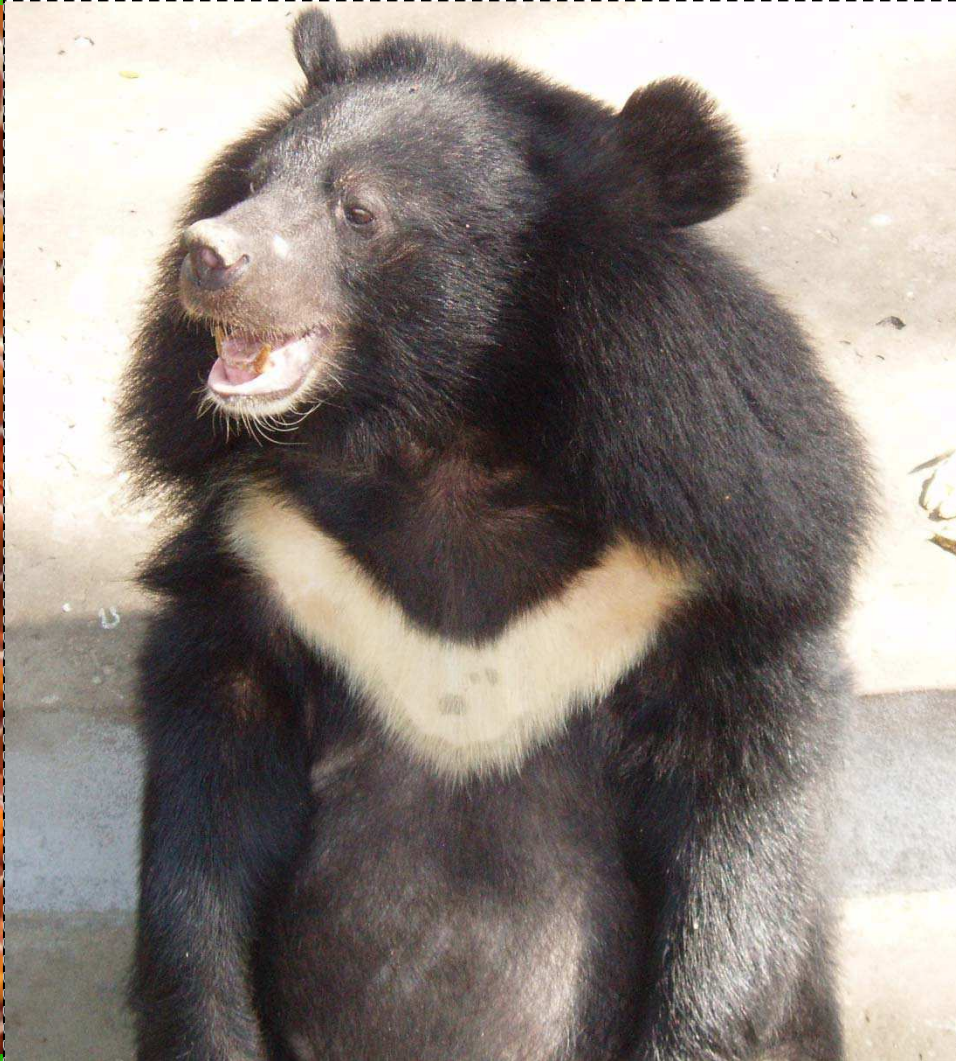
- It is being sold in the store's pharmacy instead of its food hall because of the honey's apparent health benefits.
- The 120g pots of Life Mel honey are popular with celebrities such as Sienna Miller and Kylie Minogue, Harrods said.
- Life Mel has a high price tag because it is made by honey bees fed on a specially created diet which includes herbs such as Siberian ginseng and Echinacea.
- It has a strong taste similar to manuka honey and is made without artificial ingredients.
- Harrods press and product manager Andre Dang said the honey was sold in the Harrods' Farmacia because it was used as a health product.

There is no honey like your own!



- If you're not a beekeeper, buy honey from a known and trusted local source.
- If you are a producer, quality control begins in the field. Take PRIDE in your product.
- If you're a large scale packer, establish an excellent business relationship based on trust, transparency and traceability with your suppliers.
- If you are a national entity, maintain product pride, national pride, and reputation for your honey producers. Monitor the market.

Thank you – cảm ơn



Stephen Petersen, Fairbanks ALASKA

Dr. Vaughn Bryant, Texas A&M University, TEXAS