Istituto Zooprofilattico Sperimentale del Lazio e della Toscana *M. Aleandri*

UNITA' OPERATIVA APICOLTURA

6° th APIMEDICA & 5 th APIQUALITY INTERNATIONAL SYMPOSIUM

Novotel - Roma Eur

22-25 Novembre 2016

GEOGRAFICAL AND BOTANICAL ORIGIN OF HONEYS.
INTERNATIONAL HONEY COMMISSION PROFICIENCY TEST 2015-2016

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Beekeeping Unit

Zooprofilattico Institute of Lazio and Tuscany "M. Aleandri "

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Honey is a natural product,

for its composition and for its

beneficial properties since ancient times

can be used

both as a food

both as a therapeutic product

there are

many types of honey

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The analysis melissopalynological

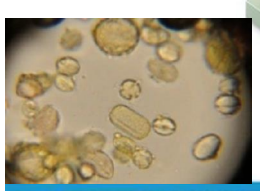
It allows to recognize the origin of the honey,

both botany

(monofloral honey, wildflower honey, honeydew)

that geographical

(Country / countries of origin)



With this analysis identify pollen grains present in honey (POLLEN SPECTRUM)

Pollens originate from flowers where bees have collected nectar (Transformed into honey)

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The analysis melissopalynological

It is therefore a very important tool

for the

marketing of honey:

Is able to establish if there is

compliance with what is stated on the label

and if we are in the presence of

any commercial fraud

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Why is it important to know the

ORIGIN BOTANY honeys?

*** To check the compliance with the statements on the label**

*** To check for fraud**

*** Because for every type of honey correspond different composition and property**

Examples:

honeydew

richer in minerals

acacia's honey

richer in fructose

manuka honey

used for the treatment of wounds in human and animal clinical








- MIELE DI ACACIA
- MIELE DI AGRUMI
- MIELE DI ARANCIO
- MIELE DI CARDO
- MIELE DI CASTAGNO
- MIELE DI CORBEZZOLO
- MIELE DI ERBA MEDICA
- MIELE DI ERICA
- MIELE DI EUCALIPTO
- MIELE DI GIRASOLE
- MIELE DI LUPINELLA
- MIELE DI MELATA
- MIELE DI MELATA DI ABETE
- MIELE DI RODODENDRO
- MIELE DI SULLA
- MIELE DI TARASSACO
- MIELE DI TIGLIO
- MIELE DI TIMO
- MIELE DI TRIFOGLIO

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ANALYSIS FOR THE BOTANICAL ORIGIN OF HONEY

Melissopalynological qualitative analysis

Count at least 500 pollen grains and the corresponding indicators honeydew

Expression of results:

dominant pollen
>45%

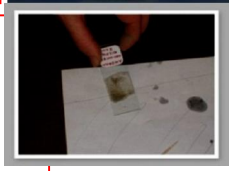
accompanying pollen
16-45%

pollen isolated accompanying
3-15%

pollen isolated
<3%

Melissopalynological quantitative analysis

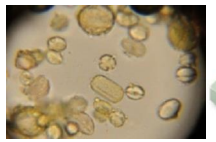
Number of pollen grains per 10 grams of honey



Expression of results:
PK/10 g
Representativeness of classes

I < 20.000
II 20.000 -- 100.000
III 100.000 -- 500.000
IV 500.000 – 1000.000
V >1000.000

SHEETS CHARACTERIZATION OF HONEY



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ANALYSIS FOR THE GEOGRAPHICAL ORIGIN OF HONEY

Why is it important to know GEOGRAPHICAL ORIGIN of the honeys?

* To check the compliance with the statements on the label

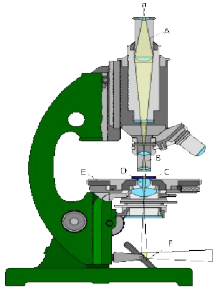
* To check for fraud

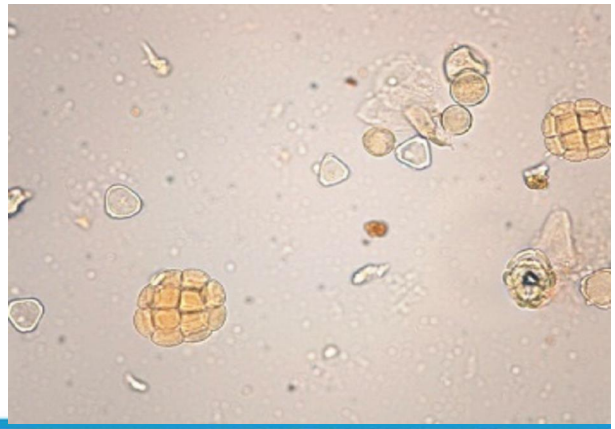
Some pollen indicators reveal the major geographical areas of origin honey

(East Europe, China, Italy, Central America, etc.)

Others may show us the real origin of the honey from areas where there are natural protected areas and not polluted

Compare pollen spectrum of honey with pollen spectra known, typical of each region





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International Commission Honey
IHC

The International Honey Commission
(International Commission Honey - IHC)
It was formed in 1990 to
standardize and harmonize
The analytical procedures for the control of honey
all over the world,
taking into account the Codex Alimentarius Standard Methods
Honey and EU Directive

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OBJECTIVES

- Å work out better and new analysis methods of honey and the other bee products
- Å inform members of the group on current aspects of quality and control of honey and other bee products
- Å work out standards for other bee products besides honey
- Å work out quality criteria for specific honeydew honeys

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Gudrun Beckh (Germany)

Vice-presidents:

Teresa Sancho (Spain)

and

Ligia Bicudo de Almeida Muradian (Brasil)

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RING TEST

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Each year organizes an IHC

proficiency testing scheme

(Ring Test)

for laboratories that perform

the melissopalynological analysis

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In this way:

reinforce the **technical** and **expertise**

of the participating laboratories.

It is evaluated

harmonization between the methods

and the results provided

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The Ring Test

is coordinated by

Dr. Maria Dimou

Laboratory of Apiculture and Sericulture Aristotle

University of Thessaloniki, Greece

and

Dr. Panagiota Gotsiou

Mediterranean Agronomic Institute of Chania, Greece

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Ring test IHC 2016

They attended in the ring-test

54 analysts from

51 different laboratories (22 accredited)

located in

Europe and West Asia

Austria, Belgium, Croatia, Cipro, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Russia, Serbia, Spain, Switzerland, Turkey

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Each laboratory received from

Dr. Paulo Antonio Russo Almeida of laboratorio Apicola da UTAD della Universidade de Tràs os Montes e Alto Dauro in Portogallo (Ring Test 2016)

and from

Prof. Maria Carmen Seijo Coello from the Faculty of Science of the University of Vigo in Spain (Ring test 2015)

a

sample of 100 grams of honey

labeled with a code for each participant.

The sample was stored at temperature

between 10 and 20 ° C until analysis.

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For each participant was given a module with the relevant identifier to write the results

was asked to:

define 4 different forms of pollen specifying the percentage

perform qualitative analysis

perform the quantitative analysis (optional)

define the botanical origin of the honey

define the geographical origin of honey (optional)

calculate the percentage of starch in honey (optional)

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The Ring test was evaluated on 3 levels:

1) Correct identification of the pollen types

2) Classification of the pollen type as nectar or not

3) Correct interpretation of results for botanical origin and geographical origin

- With the results of all the participants it was made the statistical analysis by calculating the parameters: the median value, average, ds, a soundness standard, deviation, assigned value, standard assigned value increase, the target value, standard deviation, reproducibility, z- score.

- The value assigned to each parameter was calculated from the average value of the results that were presented by the participants.

- **The z-score were considered satisfactory if less than or equal to 2**

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Ring Test IHC 2016

Pollini to identify and count	z-score melissopalynological qualitative analysis of 52 participants Satisfactory z-score: < equal 2	Botanical origin derived from participants	Geographical origin derived from participants
Echium	**51** **Satisfactory** 1 > 2 <3	**Lavender honey:** **56%** of participants with only one analysis melissopalynological **51%** of participants with melissopalynological analysis, physical chemical and sensory: in 4 cases the purposes of determining botanical changed **Multiflora:** 40% **Echium:** 2% **Other**: 2%	Country of origin (Portugal) was correctly identified by **17%** analysts. The remaining **83% said wider geographical origin but still relevant and correct (Mediterranean area, the Iberian Peninsula, southern Europe)**
Lavandula peduncolata	**48** **Satisfactory** 3 > 2 <3 1 > equal 3		
Cytisus	**41** **Satisfactory** 11 > 2 <3		
Anarrhinum bellidifolium	**40** **Satisfactory** 9 > 2 <3 2 > equal 3		

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Ring Test IHC 2015

Pollini to identify and count	z-score melissopalynological qualitative analysis of 52 participants Satisfactory z-score: < equal 2	Botanical origin derived from participants	Geographical origin derived from participants
Cytisus/Ulex type	**41** **Satisfactory** 7 2 > equal 3	**Multifloral:** **68%** of participants with only one analysis melissopalynological **67%** of participants with melissopalynological analysis, physical chemical and sensory: in 9 cases the purposes of determining botanical changed **Chestnut:** 6 % **Rubus:** 4 % **Eucalyptus:** 4 % **Other**: 18 %	Country of origin (Spain) was correctly identified by **52%** % analysts. The remaining **48% said wider geographical origin but still relevant and correct (Mediterranean area, the Iberian Peninsula, southern Europe)**
Castanea	**47** **Satisfactory** 3 > equal 3		
Eucalyptus	**46** **Satisfactory** 4 > 2 <3		
Cytisus/Ulex type & Rubus	**44** **Satisfactory** 5 > 2 <3 1 > equal 3		

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References used primarily

Melissopalynological analysis:

Armonized methods of melyssopalinogy – W. Von Der Ohe, L. Persano Oddo, M. L. Piana, M. Morlot, P. Martin (Apidologie 2014)

Botanical characterization:

Main European honeys: descriptive sheets – L. Persano Oddo, R. Piro (Apidologie 2014)

Geographic characterization:

Textbook of melyssopalinogy – G. Ricciardelli D'Albore (1997)

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Considerations

RATING
BOTANICAL ORIGIN
AND OF
GEOGRAPHICAL ORIGIN

EXPERTISE AND PROFESSIONAL EXPERIENCE ACQUIRED IN TIME

combined use

MELISSOPALYNOLOGICAL ANALYSIS

SENSORY ANALYSIS

ANALYSIS OF CHEMICAL PHYSICS

It allows you to overcome any doubts

due to the presence of pollen

“iporappresented" or "iperappresented“

that can cause problems in

the interpretation botanical origin

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Ring test IHC 2015-2016:

CONCLUSIONS

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The Ring Test put in evidence analyst skills

though sometimes it has come to the same results

but with different botanical characterization

It is believed that a further improvement

the skills can be done through*:*

Use of :

-reference pollen collection,
-POLLnet database
-standardized list of the species of pollen
-online database for the possible combinations of the most common pollens by country, region, continent, etc.
- organization of workshops, etc.

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Thank you for your Kind Attention

We Thank Dr. Maria Dimou, Dr. Panagiota Gotsiou
and the International Honey Commission
for the valuable work done