



**47<sup>th</sup> APIMONDIA**  
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## Apimondia WBA Honey contest 2022

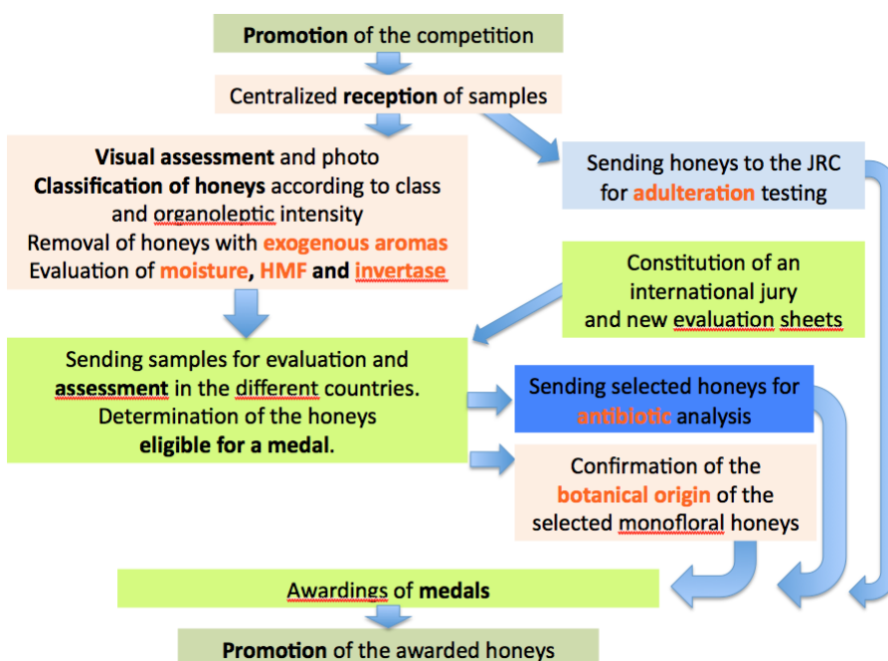
This year's WBA Honey Contest was quite different from previous editions. The aim was to ensure that the honeys submitted not only met the strictest quality criteria, but also that their organoleptic qualities fully justified the award of medals. Given the selectivity of the criteria, nearly 39% of the honeys were excluded from the selection and only 24% were awarded medals.

Here are the different phases that allowed us to arrive at these results.

### What's new

- Traceability: Each honey had to indicate the beekeepers who were the producers of the honey
- Modification of the categories and definition of a Raw honey
- Setting limits for quality honey
- Full organoleptic evaluation of all honeys
- Creation of a new international jury of competent people
- Creation of new evaluation sheets
- Organoleptic evaluation carried out in several countries

### New work schedule



## Description of the honeys

156 honeys were received at CARI from 44 individuals or companies and 21 countries.

### *Countries of origin*

#### *Europe*

Belgium, Finland, France, Germany, Greece, Ireland, Italy, North Macedonia, Romania, Slovakia, Turkey

#### *Asia*

Azerbaijan, Kuwait, Oman, Saudi Arabia, UAE

#### *America*

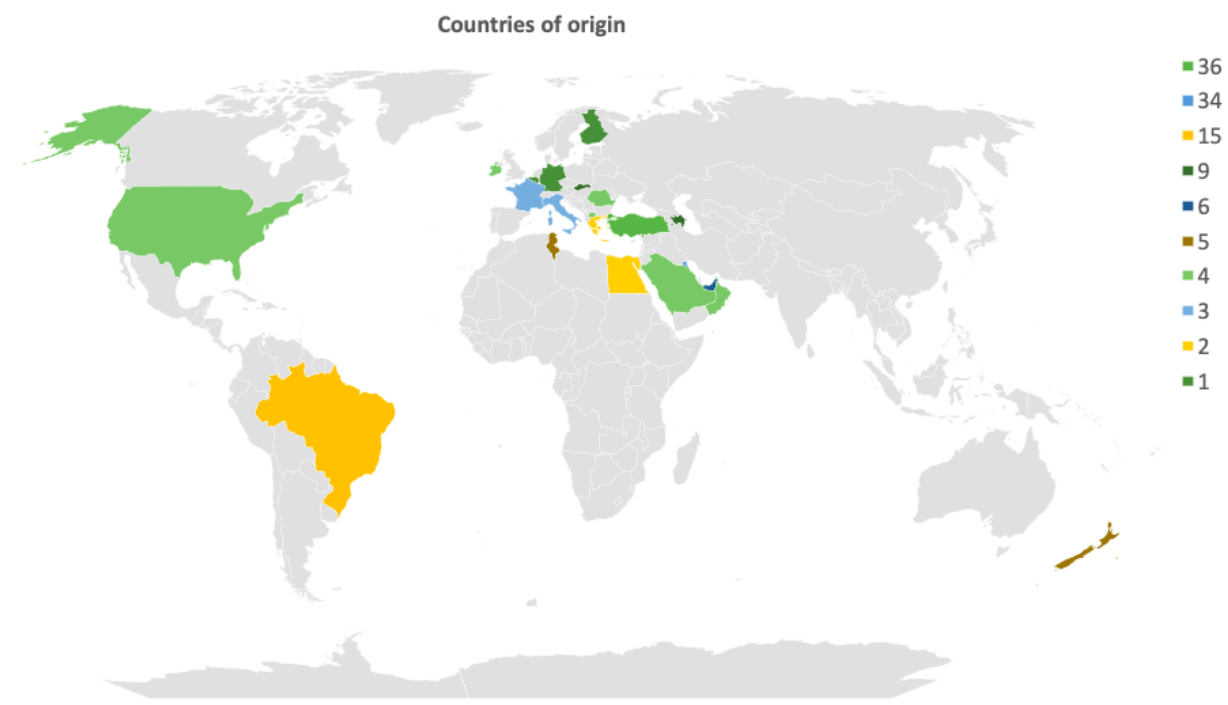
Brazil, USA

#### *Africa*

Egypt, Tunisia

#### *Oceania*

New Zealand



### *Classes*

Honeys were presented in the following 10 classes:

#### *Raw*

34–Class 1. Multifloral honey, forest honey or honeydew from different botanical origins

42–Class 2. Monofloral liquid honey or specific honeydew

14–Class 3. Crystallized multifloral honey or honeydew from different botanical origins

12–Class 4. Naturally crystallised monofloral honey or specific honeydew

12–Class 5. Pieces of cut-comb honey displayed in cut-comb containers

### *Processed*

- 08–Class 6. Multifloral liquid honey, forest honey or honeydew from different origins
- 14–Class 7. Monofloral liquid honey or specific honeydew
- 05–Class 8. Soft crystallised multifloral honey or honeydew from different origins
- 04–Class 9. Soft crystallised monofloral honey or specific honeydew
- 11–Class 10. Honey with added products

### **Botanical origin**

72 Multifloral

64 Monofloral coming from 29 different botanical origins:

15 Jujube

9 Citrus

3 Chestnut, robinia, pine

2 Manuka, Tilia, sunflower, fir, tawari, thyme, *Conocarpus lancifolius*, *frankincense*, *Acacia tortilis*

1 *Acacia hamulosa*, Assa-Peixe, heather, cedar, oak, fireweed, gum arabic, blackseed, wild olive, *Rhamnaceae*, samar, tupelo, *vitacea*

4 Monofloral with no declared botanical origin.

### **Organoleptic evaluation**

The **jury** was composed of people with some organoleptic knowledge of honeys. It was formed with the help of specialist groups. 42 experts from Portugal (13), Italy (5), Greece (6), Romania (6), Denmark (5), Sweden (5) and Belgium (2) were divided into 9 tables. The table leaders were people with experience in competitions.

Organoleptic **evaluation sheets** (visual, smell, texture, flavours and sensations, aromas) were defined according to the types of honeys presented (liquid, crystallised, monofloral or multifloral, with added products, comb honey).

**Visual criteria** (homogeneity or clarity for liquid honeys, colour, cleanliness) were analysed upon arrival and photos of each honey were taken.

An evaluation was also carried out to eliminate honeys with exogenous odours or aromas (3 honeys discarded). They were classified by increasing aromatic intensity in order to constitute relatively homogeneous tables and to define the recommended order of tasting.

Each honey was then transferred into 5 small hermetically sealed bottles to be sent to 5 different countries.

Each member of the jury received a package containing all the honeys to be evaluated as well as a file containing the evaluation sheets. The packages were sent centrally to the different countries in order to limit costs. The jury members were able to attend an explanatory session by Zoom. They were given a fortnight to return the results to their table manager and the general manager. We would like to thank them for their work.

The marks given to each honey were checked by the table managers to ensure that they were correct. An average was taken. Based on all the results and the possible variations according to the classes, a level of points was defined for the attribution of each medal: gold  $\geq 18$ , silver  $\geq 17$ , bronze  $\geq 16$ . However, the table managers had the possibility to re-evaluate some honeys.

The average evaluation was 15.2 on 150 honeys (6 were rejected before this evaluation).

### **Compliance with basic criteria**

CARI asbl carried out the basic analyses of the honeys received. Due to the delay of the samples in customs, not all of these analyses could be performed before the samples were sent to the jury members.

The average of the **water content** was 16.1% (from 14.5 to 20%). The maximum value was limited to 18%. Based on this criterion, 7 honeys were eliminated.

For **HMF** (hydroxy-methyl-furfural, a product of degradation of fructose present in the honey), the level was set at 20 mg/kg and 40 mg/kg for tropical areas. Due to the problem of transport, we increased the level from 20 to 25 mg/kg. On this basis, 9 honey did not meet these requirements.

There is a slight difference between Raw honeys and Processed honeys with averages of 9.5 and 24.2 mg/kg respectively, but the latter value reduces to 13.9 mg/kg if we exclude a honey with 333 mg/kg HMF.

**Invertase** was analysed to verify the absence of excessive heating of honey or age-related degradation. Out of the 106 Raw honeys, 20 did not meet this criterion and were therefore transferred to the similar class of Processed honey.

### **Analysis of antibiotics in honey**

Due to the cost of these analyses, only the honeys selected to receive a medal were analysed. The Intertek laboratory carried out the analyses. They tested 60 honeys for:

Tetracyclines,  
Sulfonamides and Trimethoprim,  
Streptomycin,  
Macrolides and Fluoroquinolones (MakroFloxa).

They could detect 16 samples with more than 10 ppb of some of these antibiotics.

For these 16 samples which appeared to be striking, Intertek, in addition, also analysed for the prohibited substance metronidazole.

6 of these samples contained **metronidazole** in concentrations of 0.6 to 1.1  $\mu\text{g}/\text{kg}$ .

The analysis for chloramphenicol was left out due to (time) capacities and because this prohibited substance is in 2021 sometimes present in only a few origins not present in the contest.

### **Analysis of syrup additions**

The Joint Research Centre of the European Commission in Geel carried out two tests on all the 145 samples received (excluding the added products).

They used the most effective techniques to date, namely:

#### **- *Elemental Analyser/Liquid Chromatography – Isotope Ratio Mass Spectrometry (EA/LC-IRMS)***

The combination of elemental analyser with an isotope ratio mass spectrometer (EA-IRMS) to determine the  $\delta^{13}\text{C}$  values of protein isolated from honey together with liquid chromatography coupled to an isotope ratio mass spectrometer (LC-IRMS) to determine the  $\delta^{13}\text{C}$  values of fructose, glucose, disaccharides and trisaccharides was used to detect addition of sugar syrups made from C4 plants, notably from maize, and from C3 plants, notably from rice, wheat or potato.

17 honeys had anomalies detected by this technique and were rejected.

#### **- *Liquid Chromatography – High Resolution Mass Spectrometry (LC-HRMS)***

LC-HRMS was used to identify the presence of mannose<sup>1</sup>, difructose anhydride (DFA) and 2-acetylfuran-3-glucopyranoside (AFGP)<sup>2</sup>.

22 honeys were rejected because they contained at least one of these elements.

Thus 39 out of 145 honeys (27%) were withdrawn from the competition for adulteration.

### **Control of botanical origin**

Several analyses were carried out by CARI to ensure the validity of the botanical origin of the single-flower honeys.

Several analyses were targeted to guarantee this origin: electrical conductivity for honeydew and certain monoflorals, pH for jujube, sugar spectrum for certain monoflorals and honeydew, pollens for flower honeys. It should be noted that some rare origins do not have official standards.

One citrus was rejected with a too high density and percentage of pollen. 3 jujube presented a very low percentage of pollen but these honeys were already rejected for other reasons.

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<sup>1</sup> J. Missler, T. Wiezorek and G. Beckh: Mannose: a marker for adulteration with syrup or resin treatment of blossom honey. Magnetic Resonance in Food Science 2016 Proceedings. doi: 10.1255/mrfs.4

<sup>2</sup> Bing Du, Liming Wu, Xiaofeng Xue, Lanzhen Chen, Yi Li, Jing Zhao, and Wei Cao: Rapid Screening of Multiclass Syrup Adulterants in Honey by Ultrahigh-Performance Liquid Chromatography/Quadrupole Time of Flight Mass Spectrometry. J. Agric. Food Chem. 2015, 63, 6614–6623

## Global rejection and awarding of medals

1. Raw Liquid Multifloral: 23 honeys accepted out of 34
2. Raw Liquid Monofloral: 15 honeys accepted out of 42
3. Raw Crystallised Multifloral: 8 honeys accepted out of 14
4. Raw Crystallised Monofloral: 10 honeys accepted out of 12
5. Pieces of comb: 7 honeys accepted out of 12
6. Processed Liquid Multifloral: 4 honeys accepted out of 8
7. Processed Liquid Monofloral: 13 honeys accepted out of 14
8. Processed Crystallised Multi: 5 honeys accepted out of 5
9. Processed Crystallised Monofloral: 1 honey accepted out of 4
10. Added products: 9 honeys accepted out of 11

Due to the numerous rejections mainly related to the presence of antibiotics and adulterants, only

5 gold medals were awarded out of 7 initially awarded

15 silver medals were awarded out of 29 and

17 bronze medals were awarded out of 21.

## WBA Honey 2022 Results

### 1. Raw Liquid Multifloral

USA	Clarkesville - Georgia	WEBB Virginia		SILVER
Germany	Saarland	LANGENFELD Cornelia		BRONZE
France	Paris	TANACI Volkan		BRONZE
France	Paris	TANACI Volkan		BRONZE
Tunisia	Le Kef	CHAMMAKHI Mourad		BRONZE
Greece	Northern Aegean	HASAPIS Dimitrios		BRONZE

### 2. Raw Liquid Monofloral

Greece	Northern Aegean	HASAPIS Dimitrios	Thymus	GOLD
Tunisia	Mournag-Ben Arous	CHAMMAKHI Mourad	Citrus	SILVER
North Macedonia	Strumica	GJORGJI Andonov	Chestnut	SILVER
Turkey	-	MANDIRALI Ersin	Pine	SILVER
Oman	Shalala	AL-SHANFARI Mohammed Tariq	Gum arabia	SILVER
Brazil	Southern Brazil	CATIANE Gomes Bristot	Rhamnaceae	SILVER
Finland	Oulu country	TERVOLA Raimo	Fireweed	SILVER
Turkey	Mersin	CAY Celal	Oak honeydew	BRONZE
Oman	Shalala	AL-SHANFARI Mohammed Tariq	Franckincense	BRONZE

### 4. Raw Crystallised Monofloral

Turkey	Amasya	CELEBI Halit	Sunflower	BRONZE
Italy	Emilia Romagna	CONAPI	Linden	BRONZE
Azerbaijan	Sheki	LATIF Lativov	Linden	BRONZE

### 5. Pieces of comb

USA	Clarkesville - Georgia	WEBB Virginia		SILVER
Turkey	Mersin	CAY Celal		SILVER
Turkey	Mersin	ERTAS CAY Gokce		BRONZE

## 6. Processed Liquid Multi

Brazil	Southern Brazil	CATIANE Gomes Bristot		BRONZE
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## 7. Processed Liquid Monofloral

Slovakia	Banska Bystrica region	KÖSZEGI Arpad	Acacia	GOLD
Slovakia	Presov region	VOLANSKI Martin	Fir honeydew	GOLD
Slovakia	Presov region	VOLANSKI Jozef	Fir honeydew	GOLD
USA	Clarkesville - Georgia	WEBB Virginia	Sourwood	GOLD
Brazil	Southern Brazil	CATIANE Gomes Bristot	Citrus	SILVER
Turkey	Mersin	CAY Celal	Cedar honeydew	SILVER
Slovakia	Presov region	VOLANSKI Jozef	Acacia	SILVER
Slovakia	Presov region	VOLANSKI Martin	Acacia	SILVER
New Zealand	Taranaki	ALLOUMI Salem	Manuka	SILVER
Kuwait	Alzoor	ALAZMI Mashal	<i>Acacia tortilis</i>	SILVER
Brazil	Southern Brazil	HERCILIO MARCOS DA SILVA Celio	Citrus	BRONZE
Brazil	Southern Brazil	SANTOS DA SILVA Tarciano	Citrus	BRONZE
Kuwait	Wafra farm	ALAZMI Mashal	<i>Acacia tortilis</i>	BRONZE

## 8. Processed Crystallised Multifloral

New Zealand	Bay of Plenty	MITCHELL Jody		BRONZE
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## 10. Added products

Romania		RASCANU Dumitru		BRONZE
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## Acknowledgements

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all the beekeepers who sent us their honey(s) and participated in this competition.

Next year, we hope that this formula will be maintained and adapted to Chile, the host country of the 2023 Apimondia Congress and that you will once again be with us.

Etienne Bruneau

President of the Apimondia Scientific Commission on Beekeeping Technology and Quality

Louvain-la-Neuve (Belgium), 5<sup>th</sup> September 2022