Mecklenburg County Beekeepers Association
2022 Honey Tasting Winning Honey Analysis
By George McAllister

March 2023 Special Edition

Left: Figure 1. Percent of primary pollen types with >3% abundance. Below: List of minor types with <3% abundance.
Honey Tasting Contest Winning Honey Analysis

By George McAllister

The honey analysis for the 2022 honey tasting contest winning honey lists all the identifiable pollen sources found in the honey sample along with their percentage concentrations. This well established and widely used method identifies the plants the bees visited from the pollen in a given honey sample. The analysis identifies the pollen in the honey, NOT necessarily the nectar concentrations or sources that make up the honey. With a little research based on the pollen sources listed, you can get an idea of which plants are most likely the nectar sources of your honey.

This past year’s winning honey from Gene Hilton lists the major pollen sources as rose (39.8%), crepe myrtle (22.7%), sumac (13.0%), maple (5.3%) and ash (2.9%). Although crepe myrtle and ash have high pollen percentages in the sample, bees do not gather much if any nectar from these plants to make honey. The rose family, sumac and maples however are good sources of nectar.

When comparing four of the past winning honeys prior to 2022, there are some similarities. Blackberry is specifically mentioned as one of the top three highest pollen percentages in 3 of the 4 honey samples. Blackberry is in the Rosaceae family which is one of dominate pollens in the most recent winning honey, but blackberry is not named specifically in the report.

Poison Ivy is specifically mentioned as one of the top three highest pollen percentages in 3 of the 4 honey samples prior to 2022. Poison Ivey is in the Anacardaceae family which is one of dominate pollens in the most recent winning honey, but poison ivy is not named specifically in the report.

Clover is specifically mentioned as one of the top three highest pollen percentages in 3 of the 4 honey samples prior to 2022. In the most recent winning honey, clover has one of the lowest pollen count percentages.

The four winning honeys prior to 2022 were all analyzed by Dr. Vaughn Bryant, Jr. who passed away in 2021. The 2022 winning honey was analyzed by a different company. This may explain why there may be more similarity between the most recent winning honey and past winners than we can determine.

When comparing the past winning honeys, it appears the club tends to like honey with similar pollen profiles. Dr. Bryant, Jr. also made the same observation when we discussed the similarities before his death. He was always interested in analyzing our winning honey to see if the club’s taste preferences changed over time.

If you are interested in having your honey analyzed go to pearl-research.com

-George McAllister
Honey Pollen Profile
George McCallister, Mecklenburg County
February 2023

Included in your honey pollen profile are:
- Percentage of pollen types determined through a 300-grain pollen count
- List of major types and trace pollen
- Pollen concentration

Pollen Concentration Value:
3034.05 pollen grains/gram of honey

Minor Pollen Types
- Magnolia (magnolia), Rhamnaceae (buckthorn family), Ligustrum (privet), Ulmus (elm), Anacardiaceae (sumac family), Asteraceae - Sunflower type, Brassicaceae (cabbage family), Caryophyllaceae (carnation family), Celtis (hackberry), Juglans (walnut), Parthenocissus (Virginia creeper), Pinus (pine), Plantago (plantain), Poaceae (grass family), Quercus (oak), Rubiaceae (bush and family), Sambucus (elderberry), Taraxacum (dandelion), Trifolium (clover), Vitis (grape)

Pollen Extraction Procedure
1) Diluted 10 grams of honey with 100 mL of deionized water.
2) Added 9,666 Lycopodium clavatum (Club moss) to serve as a control and calculate concentration values (pollen grains/gram).
3) Transferred honey sample to a test tube for centrifugation to concentrate pollen and dispose of the additional water.
4) Dehydrated sample using 200 proof ethanol.
5) Acetolysis using a nine to one acetic anhydride to sulfuric acid solution. Acetolysis eliminates the cytoplasm in the pollen grains and allows for the structures of the pollen to be visible.
6) Washed with 200 proof ethanol and stained to enhance the pollen structures.
7) Sealed in a sample tube in glycerin USP until viewed under the microscope.

Pollen Counting and Analysis
We used a light microscope at 400x magnification. First, we scanned the sample and photographed and described unique pollen types. If we were unfamiliar with a pollen grain, we compared with published pollen keys and an extensive digitized modern pollen reference collection from Texas A&M University. We counted a sum of >300 pollen grains and then scanned the slide for new pollen types that did not appear in the original count. We then calculated concentration (pollen grains/gram) using the following formula:

\[ \text{pollen counted} + \text{Lycopodium added} \]
\[ \text{(Lycopodium counted} \times 10 \text{ grams)} \]

RESULTS
Overall, this is a mixed floral-source honey, with no predominant pollen type (see Table 1). The major pollen types found in this sample are from rose, ash, maple, sumac, and crepe myrtle plant sources (Figure 1). These pollen types are consistent with the vegetation found in the greater Charlotte, NC area. All pollen types recovered in this sample are listed in Table 2.

<table>
<thead>
<tr>
<th>%</th>
<th>Class</th>
<th>Class ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;45%</td>
<td>Predominant</td>
<td>A</td>
</tr>
<tr>
<td>16-45%</td>
<td>Secondary</td>
<td>B</td>
</tr>
<tr>
<td>3-15%</td>
<td>Important Minor</td>
<td>C</td>
</tr>
<tr>
<td>&lt;3%</td>
<td>Minor</td>
<td>D</td>
</tr>
</tbody>
</table>

Table 1. Recognized pollen percentage classes for honey analysis (Louveaux 1978).

<table>
<thead>
<tr>
<th>Taxa</th>
<th>Count</th>
<th>Percentage</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rosaceae, c.f. Rosa (rose)</td>
<td>135</td>
<td>39.8%</td>
<td>B</td>
</tr>
<tr>
<td>Lagerstroemia (crepe myrtle)</td>
<td>77</td>
<td>22.7%</td>
<td>B</td>
</tr>
<tr>
<td>Rhus (sumac)</td>
<td>44</td>
<td>13.0%</td>
<td>C</td>
</tr>
</tbody>
</table>
Rosaceae (rose family)  23  6.8%  D
Acer (maple)  18  5.3%  D
Fraxinus (ash)  10  2.9%  D
Magnolia (magnolia)  3  0.9%  D
Rhamnaceae (buckthorn family)  3  0.9%  D
Ligustrum (privet)  2  0.6%  D
Ulmus (elm)  2  0.6%  D
Anacardiaceae (sumac family)  1  0.3%  D
Asteraceae - Sunflower type  1  0.3%  D
Brassicaeae (cabbage family)  1  0.3%  D
Caryophyllaceae (carnation family)  1  0.3%  D
Celtis (hackberry)  1  0.3%  D
Juglans (walnut)  1  0.3%  D
Parthenocissus (Virginia creeper)  1  0.3%  D
Pinus (pine)  1  0.3%  D
Plantago (plantain)  1  0.3%  D
Poaceae (grass family)  1  0.3%  D
Quercus (oak)  1  0.3%  D
Rubiaceae (bedstraw family)  1  0.3%  D
Sambucus (elderberry)  1  0.3%  D
Taraxacum (dandelion)  1  0.3%  D
Trifolium (clover)  1  0.3%  D
Vitis (grape)  1  0.3%  D
Unknowns total  6  1.8%  D
Total  339
Total Lycopodium spores counted  108
Concentration value  3034.05

Table 2. Pollen Recovered in this Sample

Though some genera and species are distinguishable, many members of some plant families are indistinguishable using light microscopy. The following plant families are generally identified to the family level: Astereaceae (composites), Ericaceae (heaths & heathers), Fabaceae (legumes), Liliaceae (lilies), Poaceae (grasses), Rhamnaceae (buckthorns), and Rosaceae (rose family).

The pollen concentration value of 3,034.05 grains per gram of honey places the sample in pollen concentration Category II which is consistent with most of the honey produced in the world from floral sources (Table 3).

<table>
<thead>
<tr>
<th>Pollen Concentration</th>
<th>Category</th>
<th>Possible Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2,000 grains/gram</td>
<td>I</td>
<td>Pressure-filtered, floral sources that produce little pollen, partly produced by sugar-feeding bees, or adulterated through the addition of alternate sugar sources.</td>
</tr>
<tr>
<td>2,001-10,000</td>
<td>II</td>
<td>Majority of honey produced in the world from floral sources.</td>
</tr>
<tr>
<td>10,001-50,000</td>
<td>III</td>
<td>Floral sources that are high pollen producers or some comb storage cells containing pure pollen may have been mixed with the extracted honey.</td>
</tr>
<tr>
<td>50,001-100,000</td>
<td>IV</td>
<td>Mid to high levels of high pollen producers.</td>
</tr>
<tr>
<td>&gt;100,000</td>
<td>V</td>
<td>Multiple high-pollen producing floral sources.</td>
</tr>
</tbody>
</table>

Table 3. Table of Pollen Concentration Categories.

PHOTOS

Select Pollen Types in Present Sample.
Some photos are representative and were not taken directly from your sample. Please note that the scale bars were incorrectly calibrated and appear smaller than they should. This error did not affect the identification of pollen within your sample.

Rosaceae, c.f. Rosa (rose)
Lagerstroemia (crepe myrtle)
Rhus (sumac)
Rosaceae (rose family)
Reflections on the Honey Tasting Contest

By George McAllister

Several people have asked me about the background on our annual honey tasting contest. I introduced the contest several years ago when I was the club’s president as a way of boosting attendance at our annual business and elections meeting in November. At the time, I had no idea this was going to become an annual event.

By default and my dislike for the taste of honey, I became the emcee. Yes, I have said it publicly, I do not like the taste of honey. The taste is too sweet for my taste buds. I guess people thought since I don’t like the taste of honey, why not emcee the event going forward. Of course this is not a requirement to emcee the event so I welcome anyone who would like to emcee.

Besides becoming an annual event, the most surprising thing about the honey tasting contest to me is how similar everyone is in deciding the best tasting honey without knowing who entered any of the honey being judged. Two beekeepers have received a trophy more than once.

Each year we have a significant number of new tasters so it’s not the same people judging every year. Also, a large number of people are judging the honey. If your honey makes it to the final round it has been judged by 25 to 30 people depending on how many people are participating.

If you are fortunate to win a trophy, you truly have awesome tasting honey that has been voted on by many of your fellow beekeepers. Congratulations.
The four winning honeys prior to 2022 were all analyzed by Dr. Vaughn Bryant, Jr. who passed away in 2021. The 2022 winning honey was analyzed by a different company. This may explain why there may be more similarity between the most recent winning honey and past winners than we can determine.

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Gene Hilton
First Place 2022