Stahlman Beekeeping Notes For 2022

Pollen – Crape Myrtle?

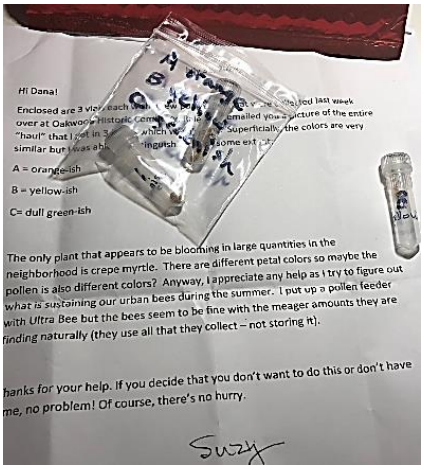
Issue 34 – August 20, 2022

I am always looking for beekeeping issues to write about. I had a request from a local beekeeper very active in keeping bees in Oakwood Historic Cemetery in Raleigh. Suzy Spencer has an interest in pollen collected by honeybees. She asked if I could help and if I had time to check some pollen samples. I did and asked her to send samples to me. She sent three vials labeled A = orange-ish pollen, B = Yellow-ish pollen, and C = dull green-ish pollen. She mentioned that the only plant blooming in large quantities in the neighborhood is white crepe myrtle. She was seeking an answer to …….

"What is sustaining our urban bees during the summer?"

I am not an expert but this is a problem many beekeepers face including myself.

This turned out to be a great project during these hot summer days. First, remember this is a hobby for me. I lack a scientific background to say a particular pollen is one that came from a plant specific to scientific identification other than to narrow down the identification to a family of plants. For example crape myrtle is in the family Lagerstroemia genus. This genus consists of around 50 species according to a quick bit of research.



It has been awhile since I have used one of the several microscopes in my closet. Microscopes come in all kinds of configurations (too many to talk about here).

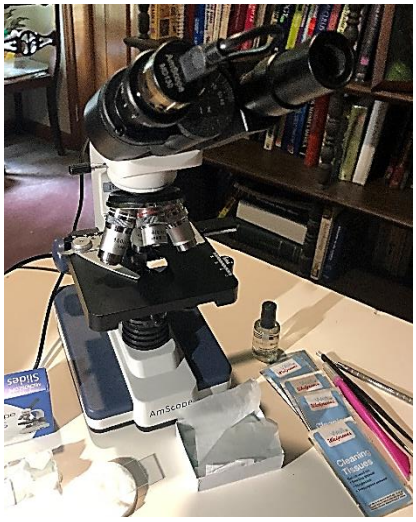
This is the package sent to me by Suzy.

So thanks to Suzy, I had something to do during hot outside temperatures.

It takes some preparation to set up and start to work on a project like this. First is the microscope. I would need something that would magnify a very tiny object. Then I would need reference materials to determine what it was that I was looking at! Fortunately,

Suzy had an SEM picture of grain of crape myrtle pollen. I could find nothing in the material I have.

I thought it might be interesting to share the tools and instruments I used to examine Suzy's pollen samples.



I used a small table to set up the microscope. I wanted to keep everything very clean around the area to prevent contamination. It is not perfect but it works.

This photo shows some of the additional things needed to examine the pollen grains.

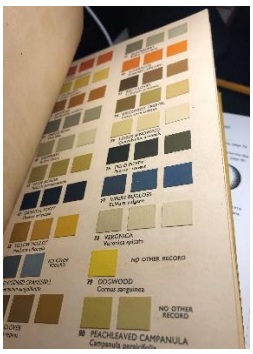
Fortunately I had on hand glass slides, cover slips, and dissecting instruments.

One other advantage I had is my equipment has a mounted camera to project the image in the microscope onto my computer screen. This gives me the ability to save every image seen by the microscope.

Information about pollen grains. Pollen grains are unique to the plant that produces them. With my set up, I could only examine the surface of individual or groups of grains. The surface, size, and shape are guides to identification. It is easy to see some of these features. Think of looking at a watermelon and then a cantaloupe. They look different on the outside. The surface of a watermelon is smooth and the surface of a cantaloupe is ridged and netted. One is round in shape and the other oval in shape. Surface feature get very complicated with some looking like a basketball covered in needles, pimples, ridges, or folds of dead skin. Pollen grains have apertures and pores as well. All of these help in pollen identification. Color doesn't help much but can give a general idea of what plants to look at for pollen identification.

One of the rarest of beekeeping pollen books was published in 1952. It was written by Dorothy Hodges and published in England. Dorothy was both an artist and beekeeper. She began the task in 1946 to make drawings of the different color patches of pollen brought back to hives. She also was interested in the microscopy of the pollen grains. (What plants produced the various colors) As she pointed out, identification of the plant included microscopic examination -- color of pollen was a guide to help with identification. She limited her work to plants growing in England.

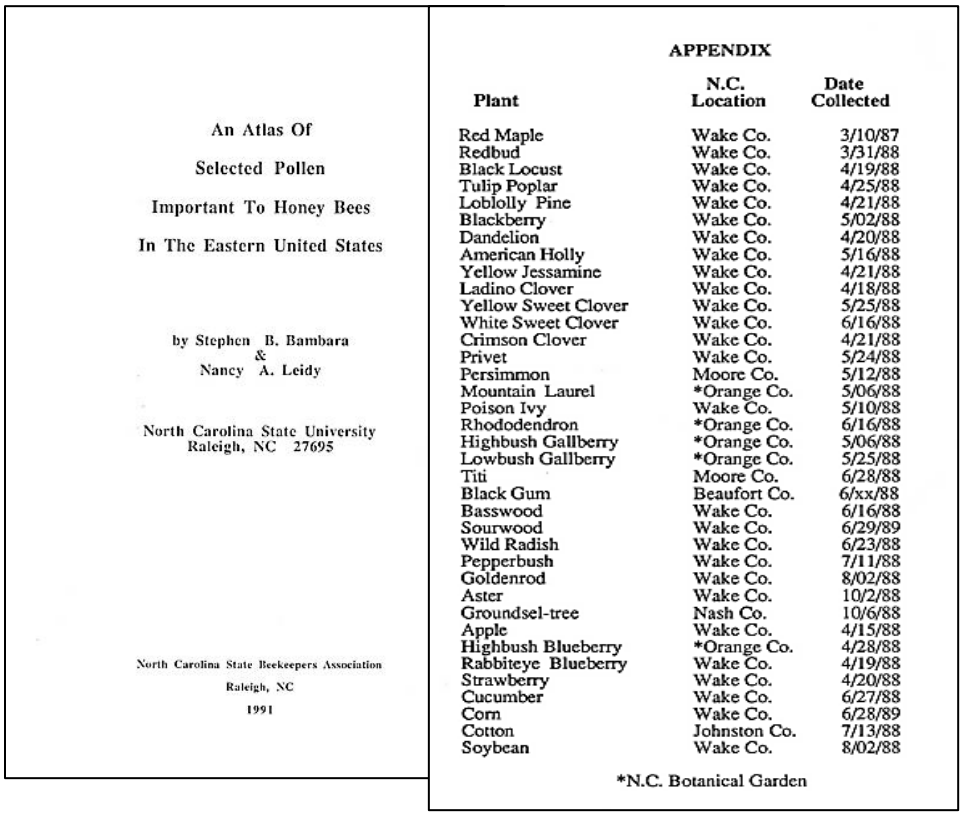
Each book of the 1952 publication included a number of watercolor plates arranged in the order of the flowering season. The color of pollen covers the rainbow. The problem is many plants produce pollen that are similar or alike. Thus, color of pollen grains is only a guess at best of the plant that produced it.



This is just a sample of pages found in her book.

Another thing to take into consideration is the flowering periods of plants. Many plant species bloom for a limited period of time – like sourwood trees here in North Carolina.

For North Carolina beekeepers and others, one might find a very interesting booklet published by the North Carolina Beekeepers Association written by Stephen Bambara and Nancy Leidy.



An Atlas Of

Selected Pollen

Important To Honey Bees

In The Eastern United States

by Stephen B. Bambara
&
Nancy A. Leidy

North Carolina State University
Raleigh, NC 27695

North Carolina State Beekeepers Association
Raleigh, NC
1991

APPENDIX

Plant	N.C. Location	Date Collected
Red Maple	Wake Co.	3/10/87
Redbud	Wake Co.	3/31/88
Black Locust	Wake Co.	4/19/88
Tulip Poplar	Wake Co.	4/25/88
Loblolly Pine	Wake Co.	4/21/88
Blackberry	Wake Co.	5/02/88
Dandelion	Wake Co.	4/20/88
American Holly	Wake Co.	5/16/88
Yellow Jessamine	Wake Co.	4/21/88
Ladino Clover	Wake Co.	4/18/88
Yellow Sweet Clover	Wake Co.	5/25/88
White Sweet Clover	Wake Co.	6/16/88
Crimson Clover	Wake Co.	4/21/88
Privet	Wake Co.	5/24/88
Persimmon	Moore Co.	5/12/88
Mountain Laurel	*Orange Co.	5/06/88
Poison Ivy	Wake Co.	5/10/88
Rhododendron	*Orange Co.	6/16/88
Highbush Gallberry	*Orange Co.	5/06/88
Lowbush Gallberry	*Orange Co.	5/25/88
Titi	Moore Co.	6/28/88
Black Gum	Beaufort Co.	6/xx/88
Basswood	Wake Co.	6/16/88
Sourwood	Wake Co.	6/29/89
Wild Radish	Wake Co.	6/23/88
Pepperbush	Wake Co.	7/11/88
Goldenrod	Wake Co.	8/02/88
Aster	Wake Co.	10/2/88
Groundsel-tree	Nash Co.	10/6/88
Apple	Wake Co.	4/15/88
Highbush Blueberry	*Orange Co.	4/28/88
Rabbiteye Blueberry	Wake Co.	4/19/88
Strawberry	Wake Co.	4/20/88
Cucumber	Wake Co.	6/27/88
Corn	Wake Co.	6/28/89
Cotton	Johnston Co.	7/13/88
Soybean	Wake Co.	8/02/88

*N.C. Botanical Garden

It includes a number of close up views of pollen grains found in honey plants growing in North Carolina. Many are widely grown in other states.

I believe a copy of this booklet is available at North Carolina State University Library.

I was fortunate to buy one at an EAS Conference many years ago.

Any identification book can only give a general idea of what a pollen grain looks like under a microscope. I am limited to a standard stereo Amscope SZM Series microscope. Some reference books use SEM photos of pollen grains. SEM stands for scanning Electron Microscope. Just like in the honey bee family, there are many specific species of plants in a

family. Most honey bees are hybrid and there-for it is difficult to identify bees to a specific race which are identified by scientific names. The compound microscope makes it possible to get close to the plant family but not specific to a member of the family. Thus, identifying white crape myrtle to red or pink crape myrtle is beyond what I can do. It would take an SEM microscopic study by an expert to do that.

To share what Suzy sent to me – I was helped greatly by her photographs from both compound and SEM microscopic views.

Pollen grains of crepe myrtle (using SEM = scanning electron microscopy)
from Czech Journal of Genetics and Plant Breeding, 55, 2019 (1): 28–34 https://doi.org/10.17221/174/2017-CJGPB
Fertility analyses of interspecific hybrids between Lagerstroemia indica and L. speciosa by
Yi-Qian Ju1, Xing Hu1, Yao Jiao, Yuan-Jun Ye, Ming Cai, Tang-Ren Cheng,
Jia Wang, Hui-Tang Pan*, Qi-Xiang Zhang

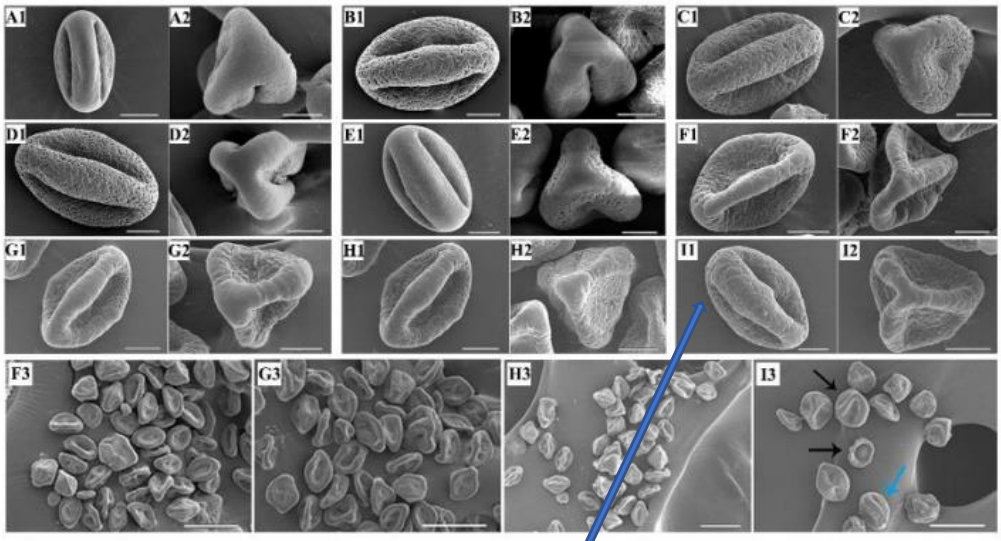
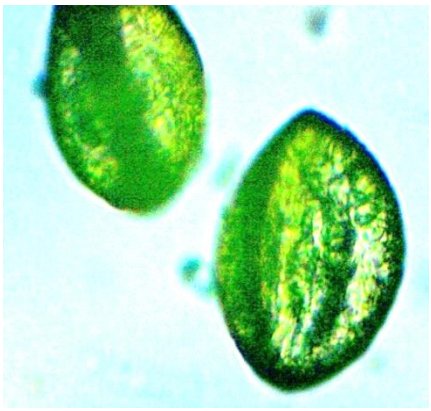


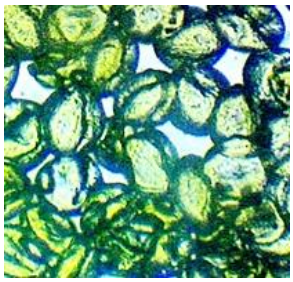
Figure 3. Pollen grains of parents and the progenies under SEM: *L. speciosa* (A), *Lagerstroemia indica* Duohuazi (B), *L. indica* Fenjing (C), *L. indica* Zixia (D), *L. indica* Creole (E), DD1 (F), FD1 (G), ZD3 (H), ZD6 (I)

Pollen is three dimensional. They have polar and equatorial views. Something like side and end views. These pollen grains are all from the family *Lagerstroemia indica*. This is the guide I used to compare a grain of pollen from a crepe myrtle tree in my yard to the samples taken from bees by Suzy.

My microscope has four lens from 40 power to 1000 power. From the material above I could see with my microscope pictures in the bottom row above (F3 to I3). I was also able to determine from pollen examples (I1 & I2) the shape from both and end view and side view.



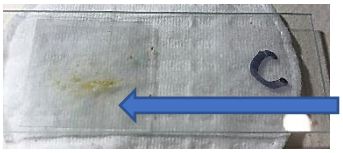
This is the picture of a pollen grain from the crepe myrtle tree in my yard.



By the way, the color of the pollen was deep yellow but appeared green under the microscope. These closely resemble the grains I had to study from the illustration in the material provided to me by Suzy. This I know, the grains in the study material closely resemble the pollen grains taken from the tree in my yard. Crape Myrtle blooms over a period of early to late summer in colors from white, pink, red, purple to a very deep red. The samples sent to me came in small glass tubes in a protective envelope.

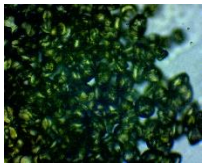
Pollen pellets are too dense to examine under a microscope. One small pellet contains thousands of individual grains of pollen.

Only a pin head of pollen from the pellet is placed on a slide for examination. A cover slip then is placed over the sample to preserve it.

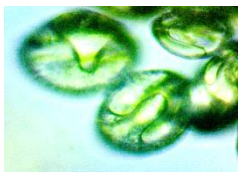


This is one of the three slides I prepared for the examination of pollen grains sent to me. Pollen grains show just a bit of color.

When placed under the microscope images indicate to me a shape, the exterior and polar and equatorial views. A comparison can be guessed at and in this case I had enough sample material to make a somewhat informative guess.



When too many pollen grains are clumped together under the cover slip, light does not pass through to give a clear picture of a pollen grain. I took over 50 pictures of individual grains at different powers of magnification. I only needed magnification of 400 x to really see the grains to help me decide that the samples were from crape myrtle and the color did not change the over-all shape and size of the samples Suzy sent to me.



This single photo from one of the samples sent shows both the polar and equatorial view of the pollen grains. The images I saw and comparisons I made convinced me that the pollen grains were most likely from the crape myrtle family.

Crape myrtle may produce pollen but it is not considered a honey source. I have been told that bees may gather nectar from white crape myrtle. Only a sample of honey with crape myrtle pollen grains in it would be positive proof of that statement. And it is possible to check for pollen grains in honey. I will follow up on that topic later this year.