

# Comparing Apples to Oranges

Teresa Kugler



# Oranges of the Past

The origin of the orange is uncertain, however the best theory is that the orange originated in Asia. To be more specific, some botanists believe it originated in India or China around the eighth or ninth century B.C. Around 1000 A.D., Oranges were generally used for their medical, aesthetic and aromatic purposes instead of as a food source. However, sweet oranges were sometimes used as flavoring in wine or tea.

Like the origin of the orange in Asia, how the Roman's acquired

the orange is also a mystery. Alfred Andrews, however, speculated that the Romans acquired their oranges from the Egyptians. The Romans orchards burned, and it wasn't until the crusades that the orange returned to spread through Europe from Arabic lands.

Later in the sixteenth century the Spanish brought over the orange to the Americas, to be more specific, Florida and Brazil. There the citrus thrived and spread as far even as California. Soon in the 1880's, Florida and

California's orange trade began to grow, taking over the market and turning it into what we see today in the United States.

Also the color orange was named after the fruit. There weren't many things that were the color of oranges and so they became a reference point for the color.



# The Age of Apples

The apple, like the orange, originated in Asia. It began to be transported to Europe by way of the Silk Road. Animals also helped with the westward



migration of the apple by way of the seeds transported by, and left behind in the animal's droppings.

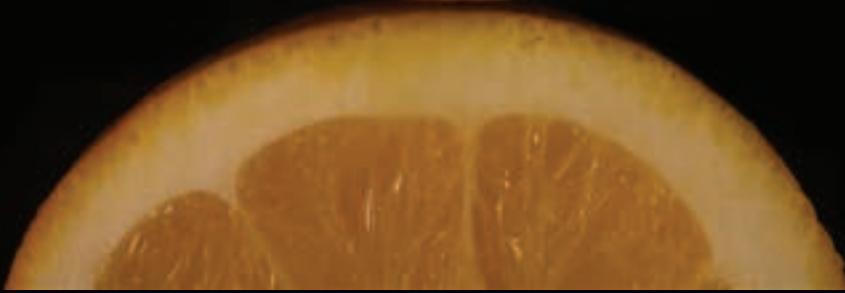
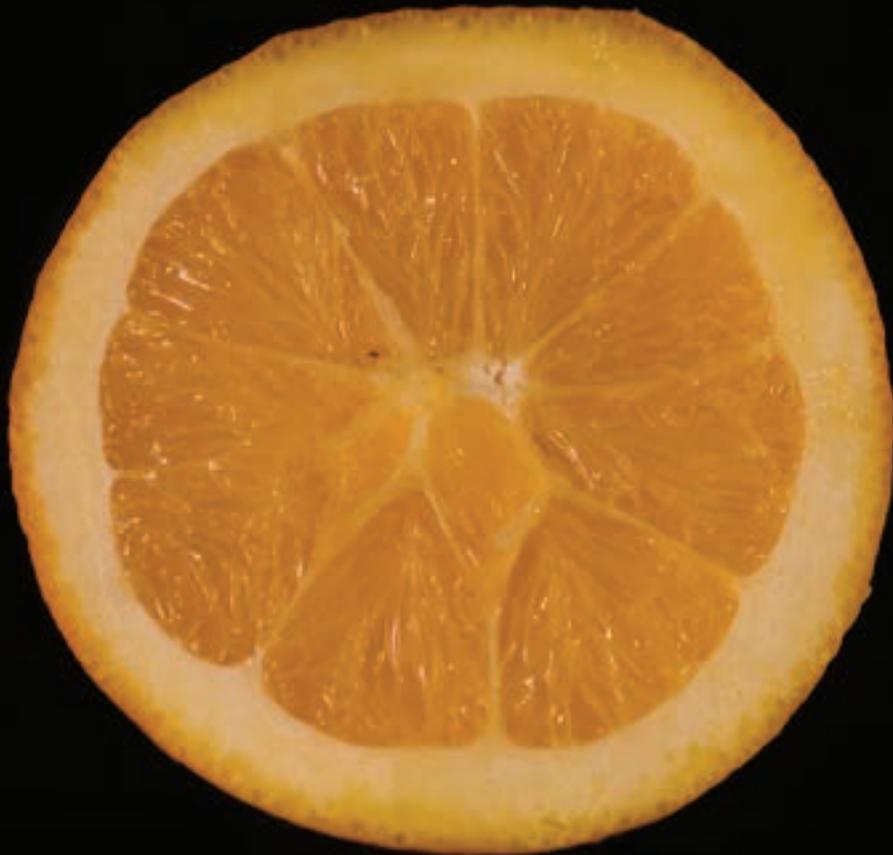
In the fifteenth century, apples began growing in popularity for use as nourishment and in cider making. Later, in the seventeenth century, the crab apple was discovered in North America. They are the only apples that are native to the United States.

Contrary to what most United States children were told, Johnny Appleseed's real name is John Chapman who dispersed seeds on his trips through Illinois, Indiana, and Ohio. From the trees, the

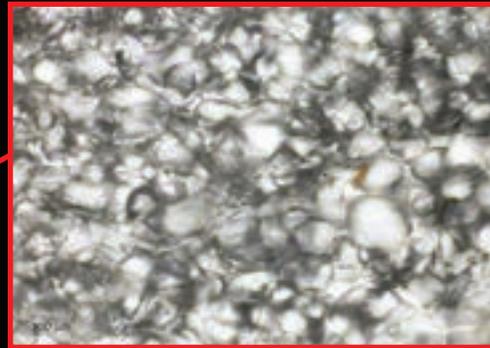
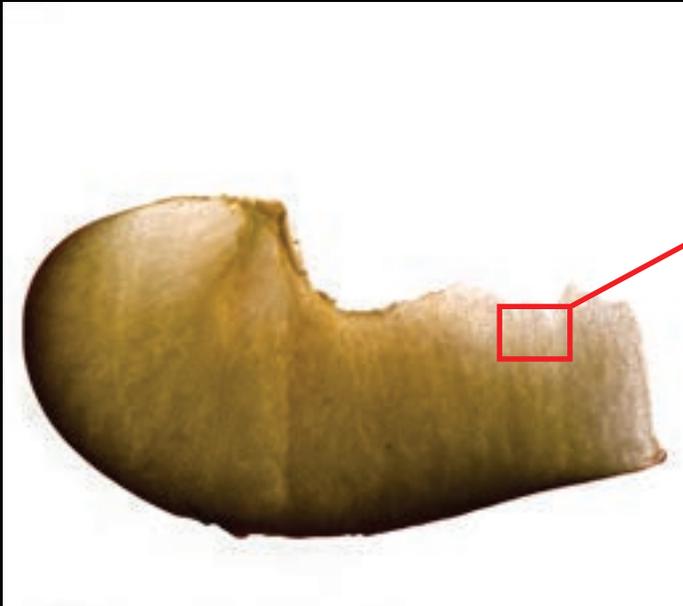
apples created were turned into cider and applejack. Unfortunately, most of these trees were burned because of temperance activists who despised the apples due to their use in the production of alcohol.

The story of Adam and Eve is usually depicted with two people, a snake, and an apple tree. However, in the bible, the "forbidden fruit" is never mentioned. It wasn't until the twelfth century that apples began to appear in paintings, mosaics and other artworks depicted as the forbidden fruit.

# A Side-by-Side Comparison

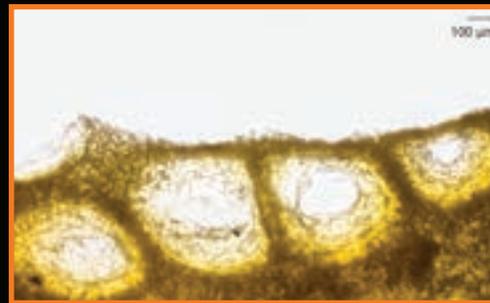


# A Microscopic Comparison

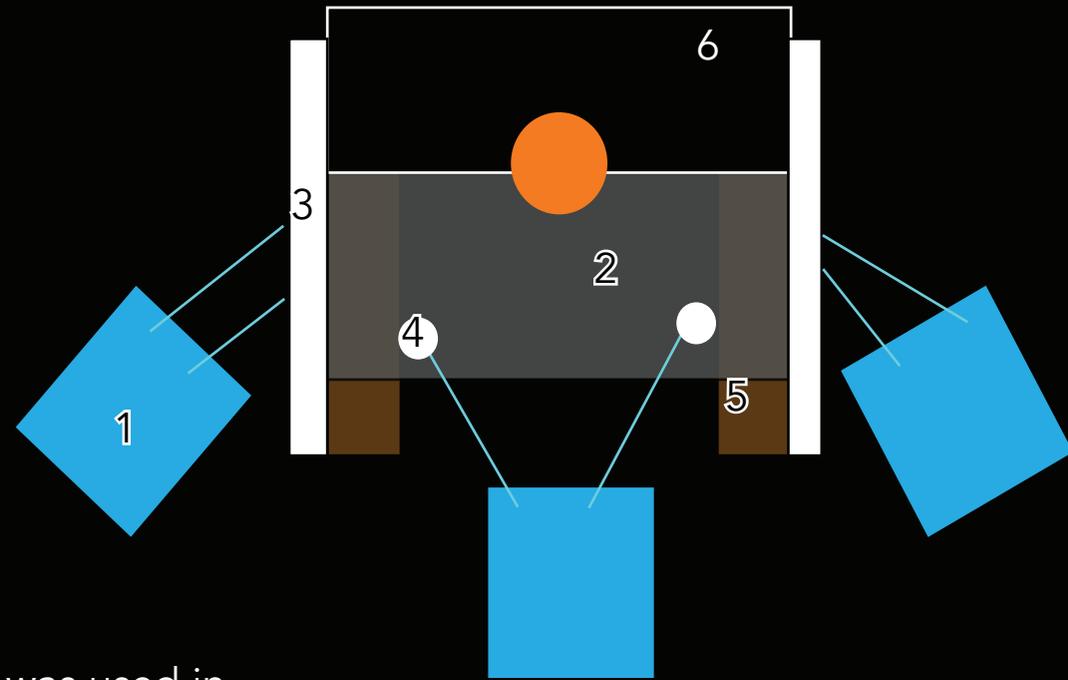


Scientific name: *Malus domestica*  
Specimen Breed: Red Delicious  
Magnification: 10X

Scientific name: *Citrus sinensis*  
Specimen Breed: Sweet Orange  
Magnification: 10X



# Photographic Setup and Techniques



## Materials used:

- Canon 6D
- Zeiss microscope
- 65mm Macro lens
- 100mm Macro
- 180mm Macro
- Fiberoptics (1)
- Glass (2)
- White Plexiglass (3)
- PingPong Balls (4)
- Wooden Blocks (5)
- Black Velvet (background) (6)

## Techniques:

Focus stacking was used in creating the microscopic photos to gain a better depth of field. They were stitched together using ZereneStacker.

When creating the slides, a microtome was used to cut the samples. The samples were cut twice. This allowed for a straighter cut.

For the sample photos with a white background, the glass was removed and replaced with a white sheet of plexiglass. Another white sheet was placed in the background as well. The fiber optic lights were then moved to light the plexiglass from behind, thus creating transillumination.

# References

- Synan, Mariel. "All About Apples." History.com. A&E Television Networks, 13 Sept. 2013. Web. 22 Nov. 2016. <<http://www.history.com/news/hungry-history/all-about-apples>>.
- Rupp, Rebecca. "The History of the "Forbidden" Fruit." The Plate. National Geographic, 22 July 2014. Web. 22 Nov. 2016. <<http://theplate.nationalgeographic.com/2014/07/22/history-of-apples/>>.
- Mason, Emma. "9 Strange Facts about the History of Apples." History Extra. BBC History, Oct. 2014. Web. 22 Nov. 2016. <<http://www.historyextra.com/feature/food/9-strange-facts-about-history-apples>>.\
- Stradley, Linda. "Apples - History and Legends of Apples." What's Cooking America., 2016. Web. 22 Nov. 2016. <<https://whatscookingamerica.net/Fruit/Apples.htm>>.
- Janik, Erika. Apple: A Global History. London: Reaktion, 2011. Print.
- New World Encyclopedia Contributors. "Orange (fruit)." Orange (fruit). New World Encyclopedia, 2 Apr. 2008. Web. 22 Nov. 2016. <[http://www.newworldencyclopedia.org/entry/Orange\\_\(fruit\)](http://www.newworldencyclopedia.org/entry/Orange_(fruit))>.
- Soniak, Matt. "Which Came First: Orange the Color or Orange the Fruit?" Mental Floss., 8 Feb. 2012. Web. 22 Nov. 2016. <<http://mentalfloss.com/article/29942/which-came-first-orange-color-or-orange-fruit>>.
- Shenron. "History of Orange Fruit." History of Things, 12 May 2009. Web. 22 Nov. 2016. <<http://www.historyofthings.com/history-of-orange-fruit>>.
- Hyman, Clarissa. Oranges: A Global History. London: Reaktion, 2013. Print.

# About Me

Teresa Kugler is a third year in the Scientific Photography Major at Rochester Institute of Technology. She helped create the Virtual Microscopy Lab over the summer of 2016. She has experiences in both high magnification and the technology side of science photography.

Email: [tak4938@rit.edu](mailto:tak4938@rit.edu)  
[tkugler.tw2@gmail.com](mailto:tkugler.tw2@gmail.com)  
Virtual Microscopy Lab  
website: [vml.cias.rit.edu](http://vml.cias.rit.edu)

