

Oxalates present in monstera fruit and plant matter

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I Background

Oxalate crystals are present in most foods we eat including and most leafy greens .

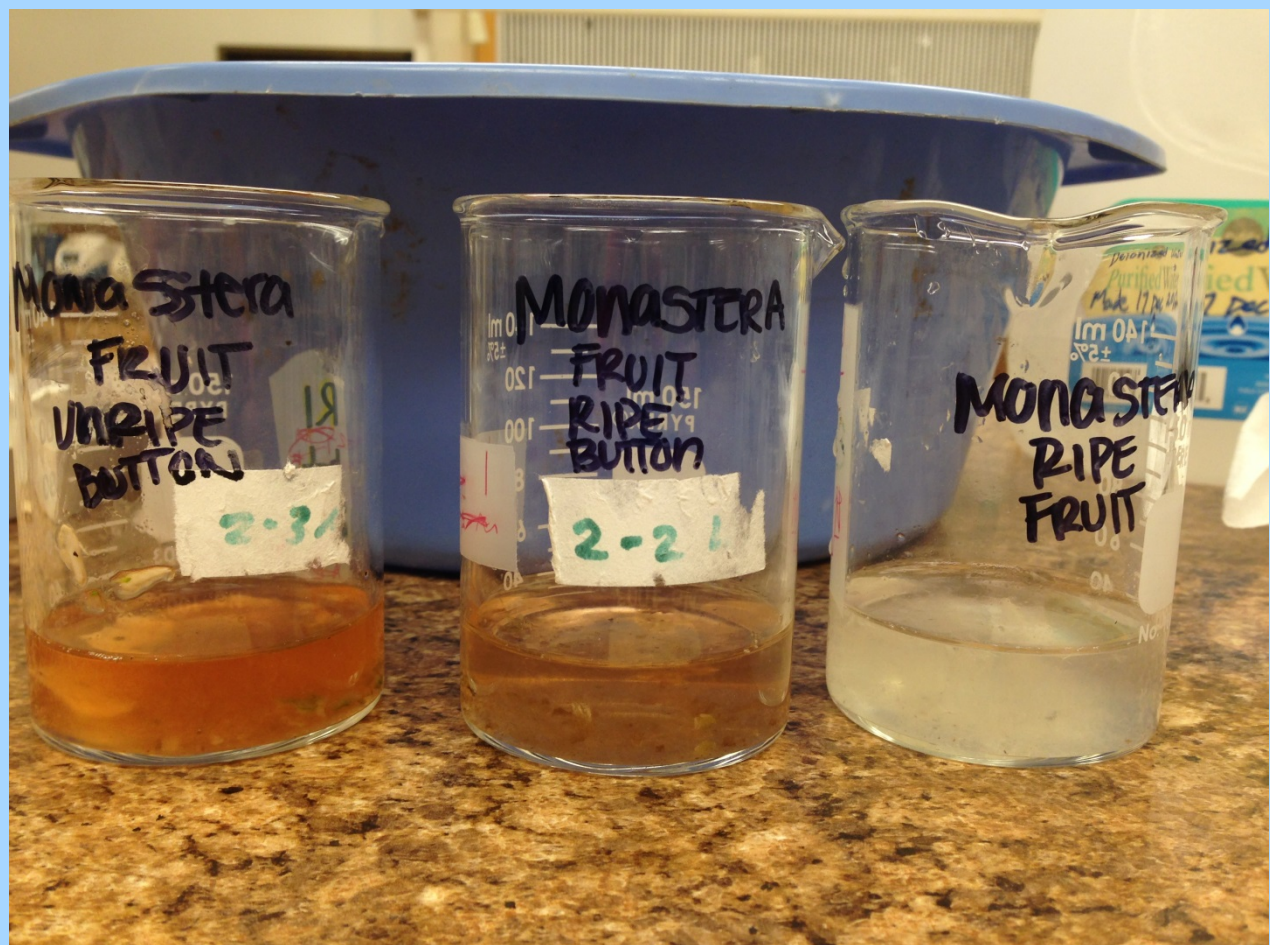
Oxalate content in common food items (Children’s Medical Center 2005)	
1/2 cup of kale, cooked	125 mg
1/2 cup of sweet potatoes	141 mg
1/2 cup of beets, cooked	675 mg
1/3 cup of peanuts, raw	113 mg

Plants contain oxalates for a few reasons. The first is that plants do not have an excretory system like animals, so oxalates allow plants the ability to bind up excess calcium (Webb 1999).Plants high in oxalates can have negative effects on the ability of animals to absorb calcium after eating taro leaves as forage (Hang 2011). In humans, eating foods with a high amounts of oxalates can increase kidney stone formation (Juajun 2012).The second reason oxalates are said to occur in plants is to prevent herbivory (Webb 1999). Oxalate crystal shapes (raphides and styloids) are like small needles and can be found in plants such as *Monstera deliciosa* and *Colocasia esculenta*. Consumption of plants containing raphides and styloids cause an unwanted reaction. The crystals within plant matter from monstera are said to cause oral and skin irritation (Morton 1987). Plants containing high levels of oxalates are able to be consumed if processed correctly or harvested at the right time.

2 Methods

Monstera plant material was collected from ECHO Florida. Samples from old and young leaves as well as ripe and unripe fruit were taken. Leaves were rolled and a razor blade was used to slice samples of leaves onto a slide with a drop of distilled water.

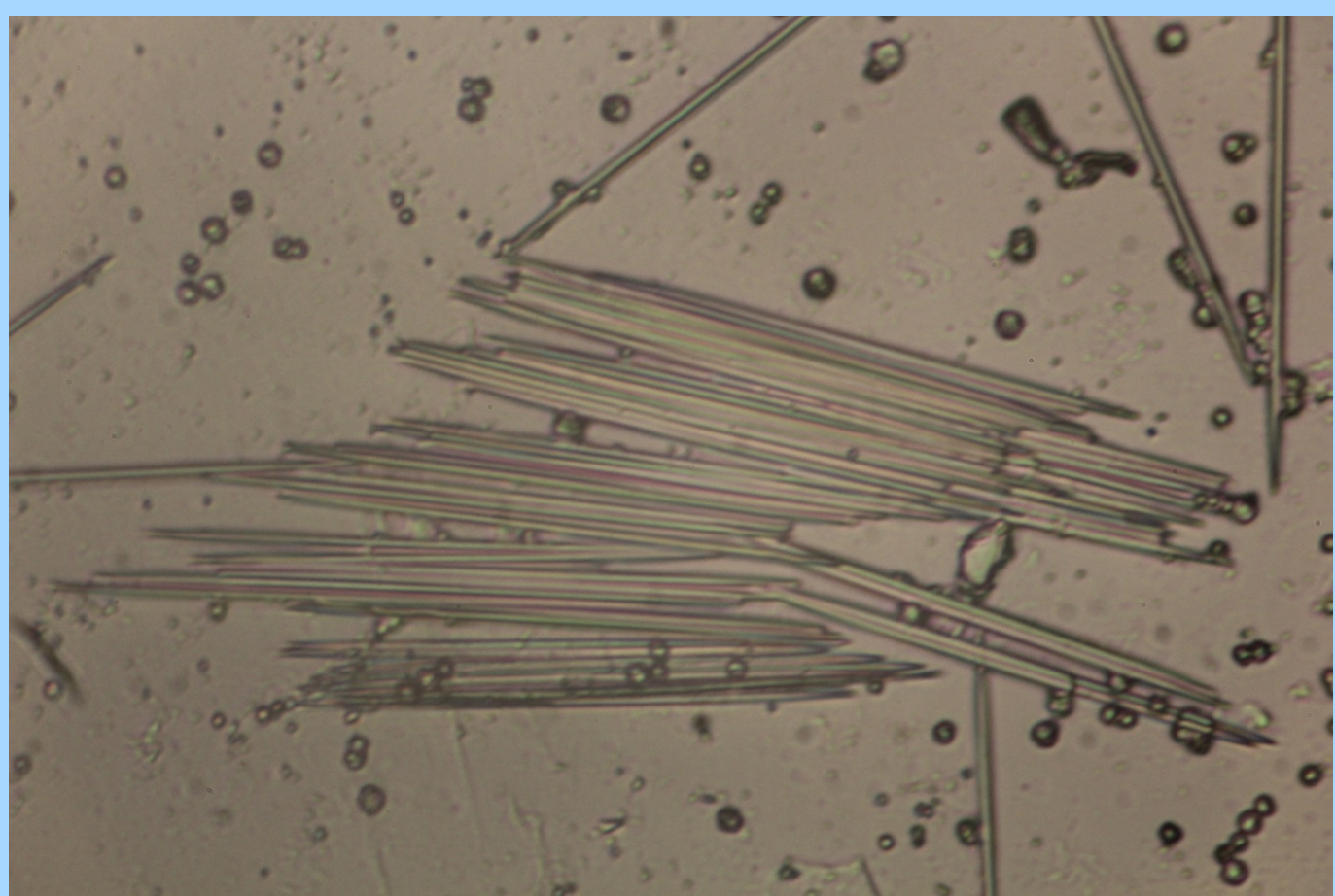
A button from an unripe fruit, a button from a ripe fruit and a piece of ripe fruit were each crushed under a mortar and pestle and then each place in 40mL of water. Drops of each were then placed on a slide, analyzed under the microscope and photographed with a Canon® camera.



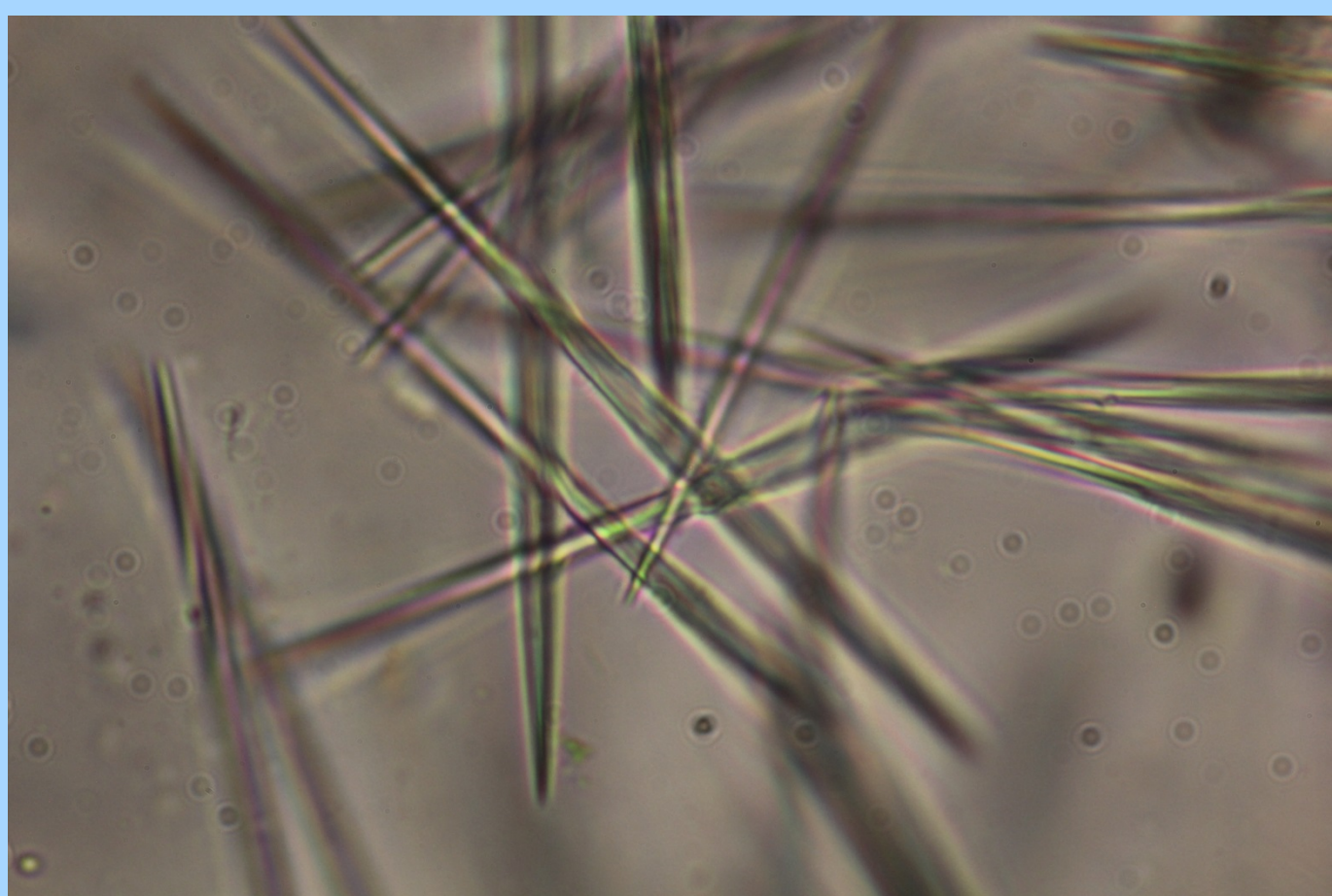
Three separate treatments of monstera dilute



Buttons from a monstera unripe fruit



Raphide oxalate crystals from a slice of a ripe monstera fruit button

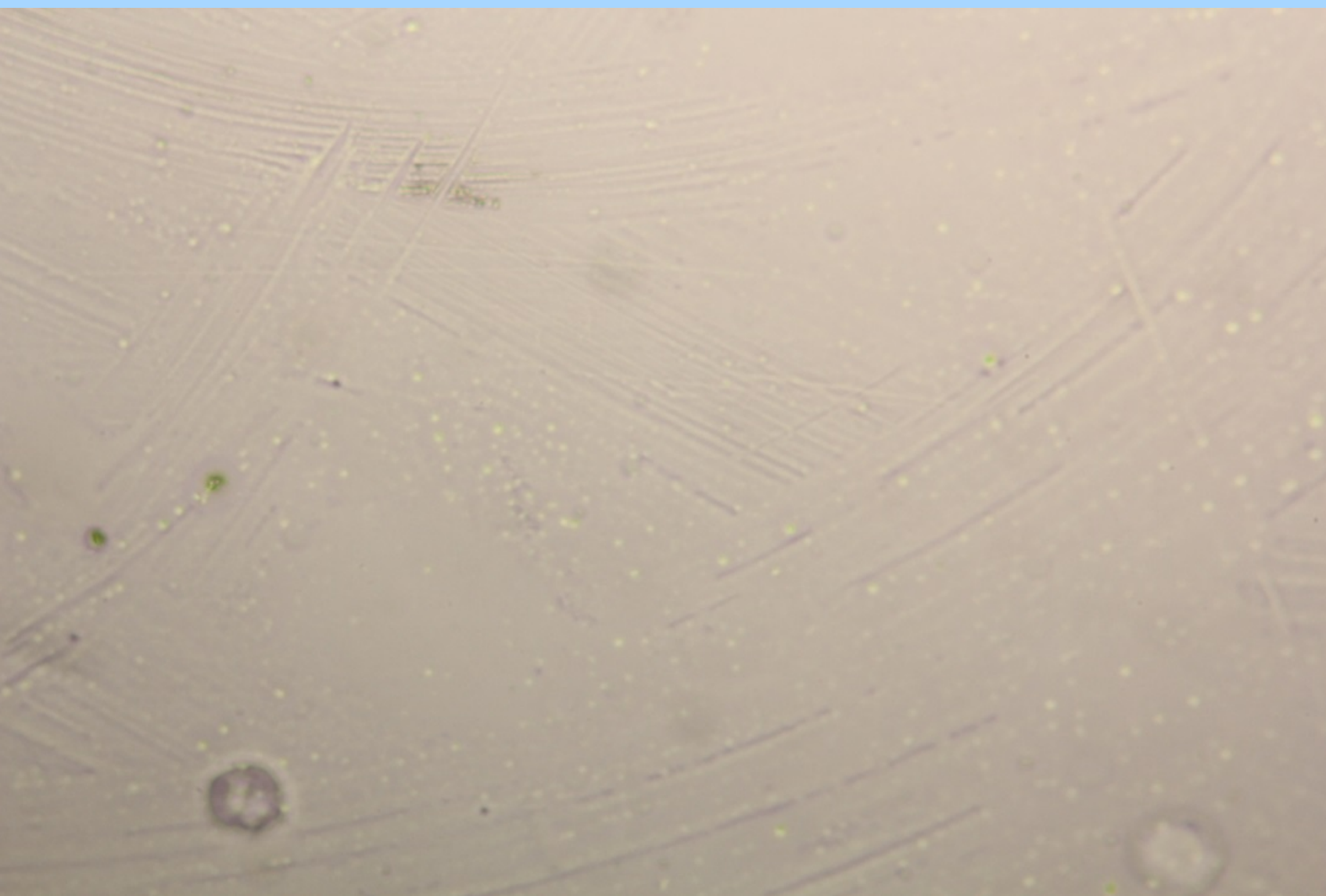


Raphide oxalate crystals from a slice of a young monstera leaf

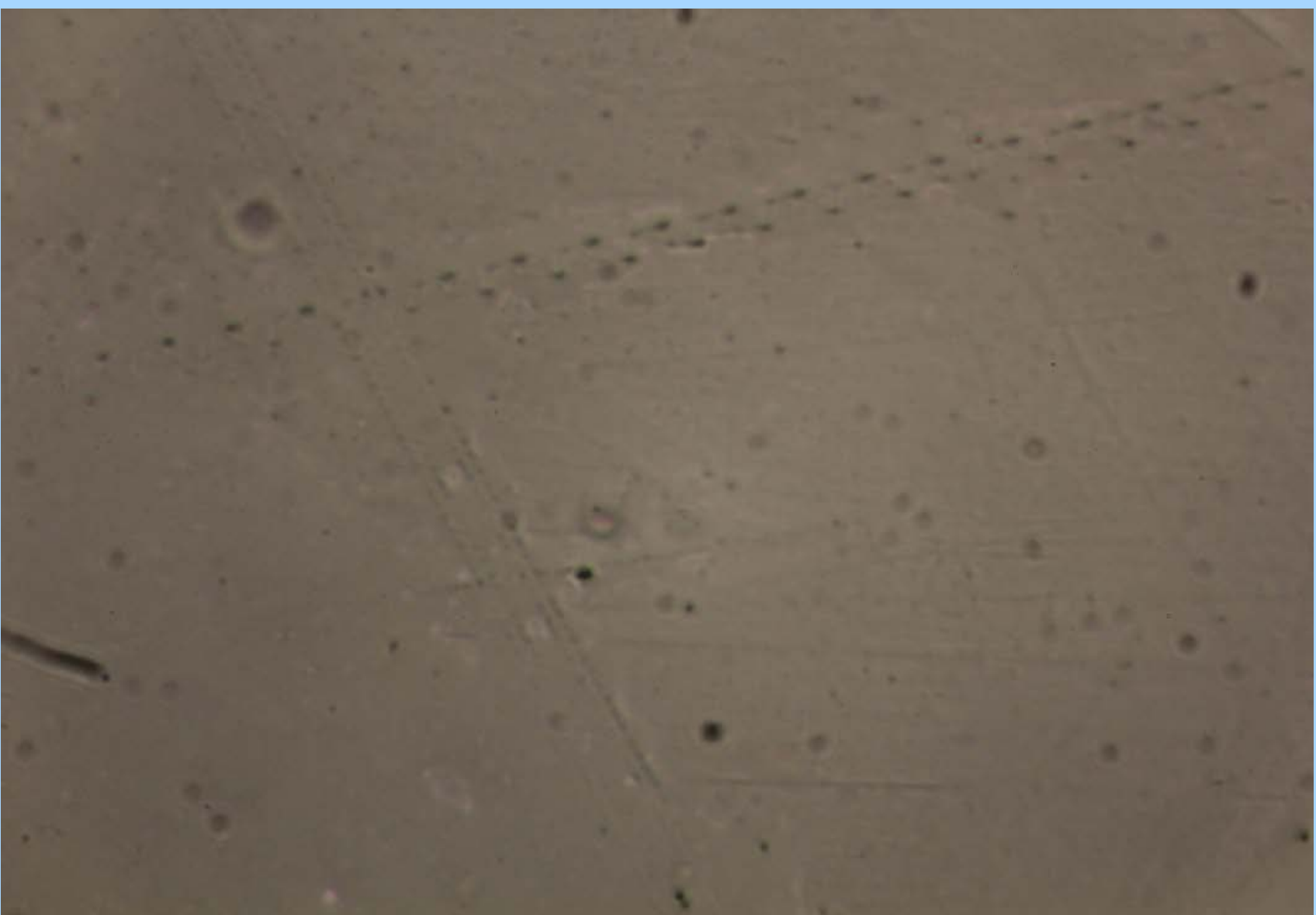
3 Results



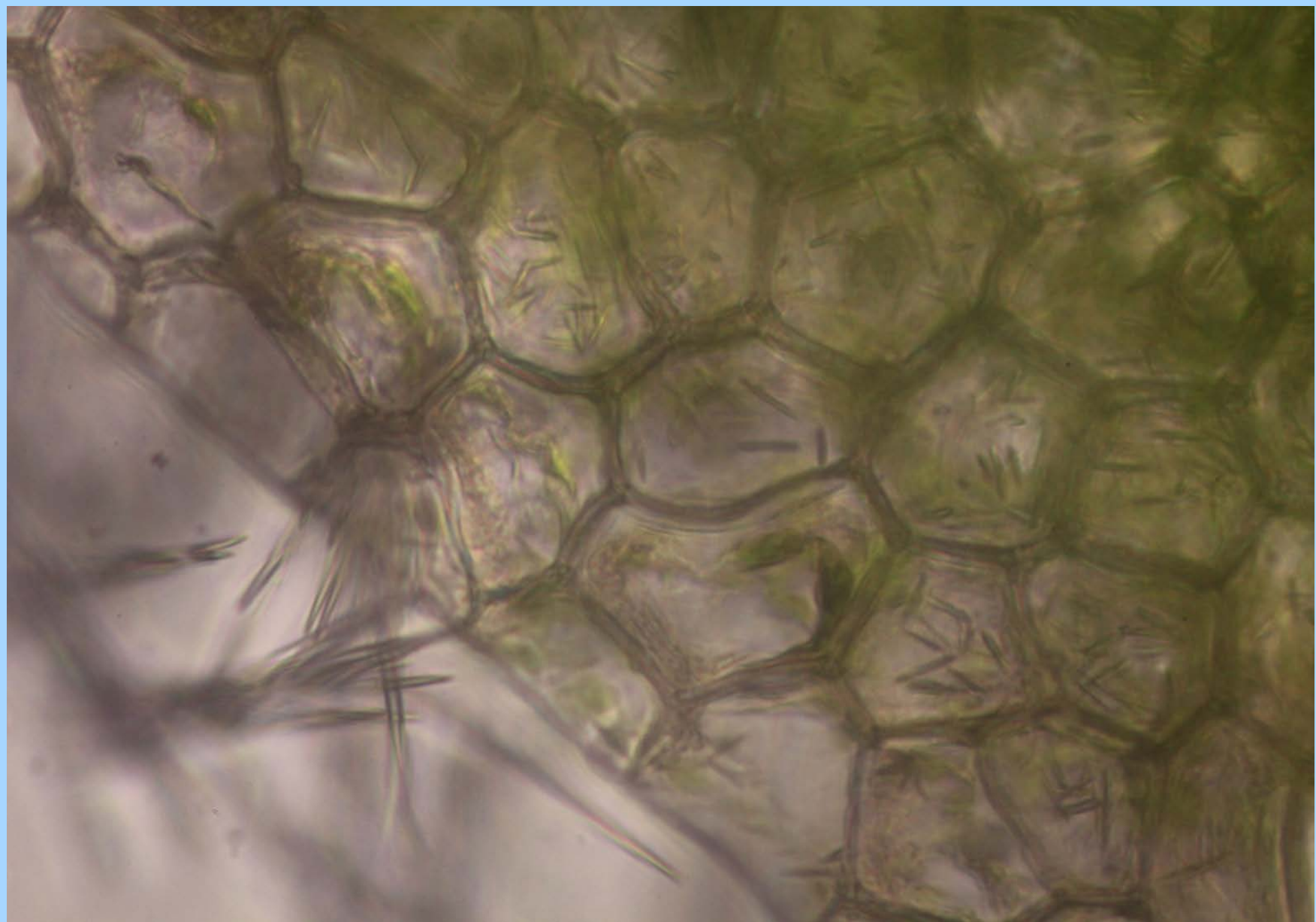
Oxalate crystals present in 40 mL dilute from an unripe fruit button



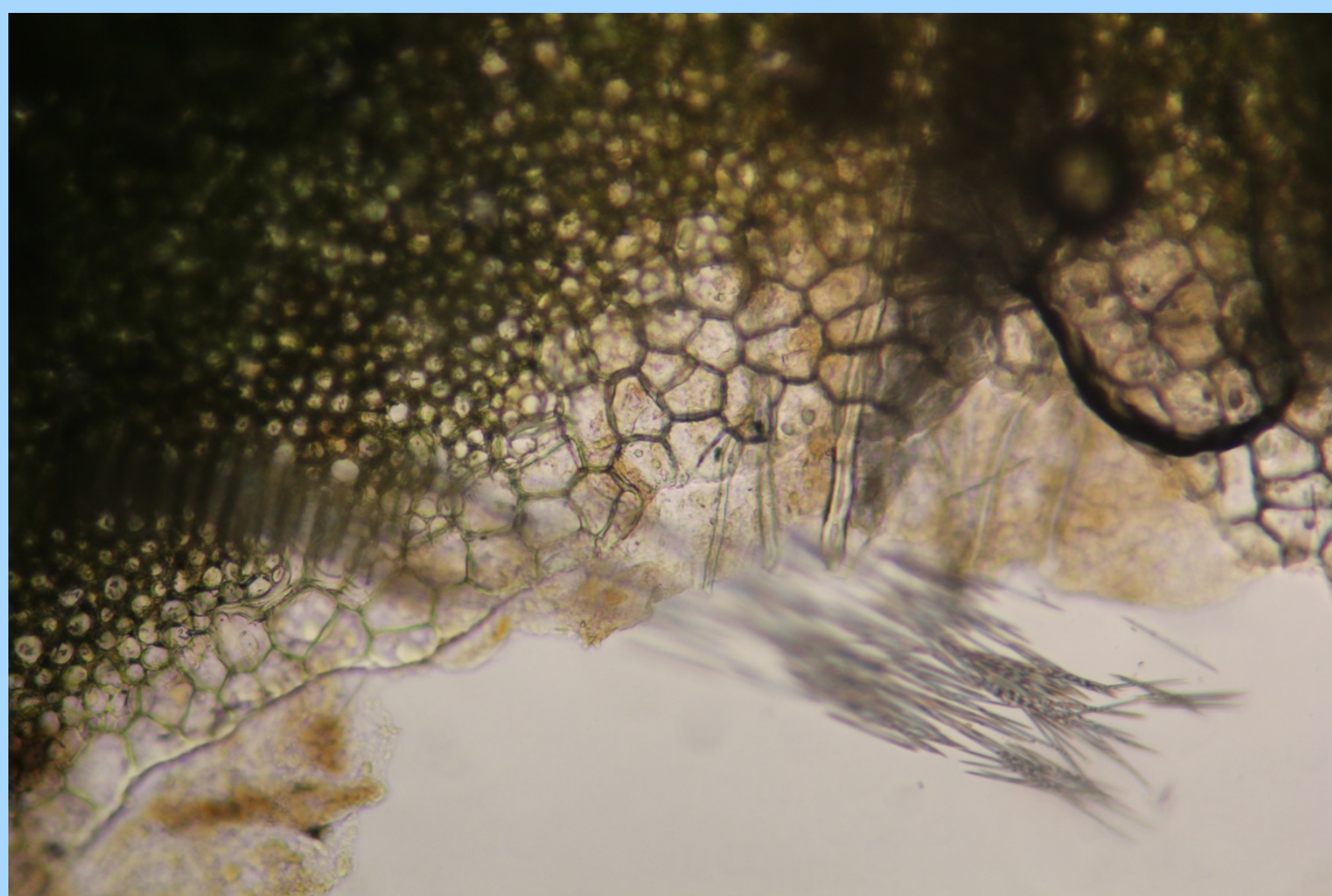
An absence of oxalate crystals in 40 mL dilute of ripe fruit button



An absence of oxalate crystals in 40 mL dilute of ripe fruit



Oxalate crystals present in the cells of a young monstera leaf



A cluster of oxalate crystals in a mature monstera leaf

4 Conclusion

ECHO Florida is interested in researching the topic further as oxalic acid acts as an anti-nutrient binding with calcium , iron, and magnesium (Jaujun 2012). Oxalate crystals raphides and styloids cause serious irritation during consumption. Oxalates play a role in how we work with and use underutilized crops.

5 References

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