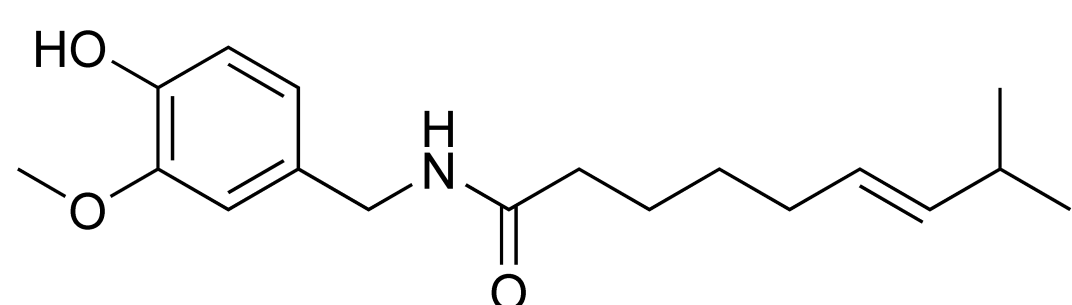


Quantitative Analysis of Capsaicin Levels in Hot Peppers to Understand Heat Inheritability

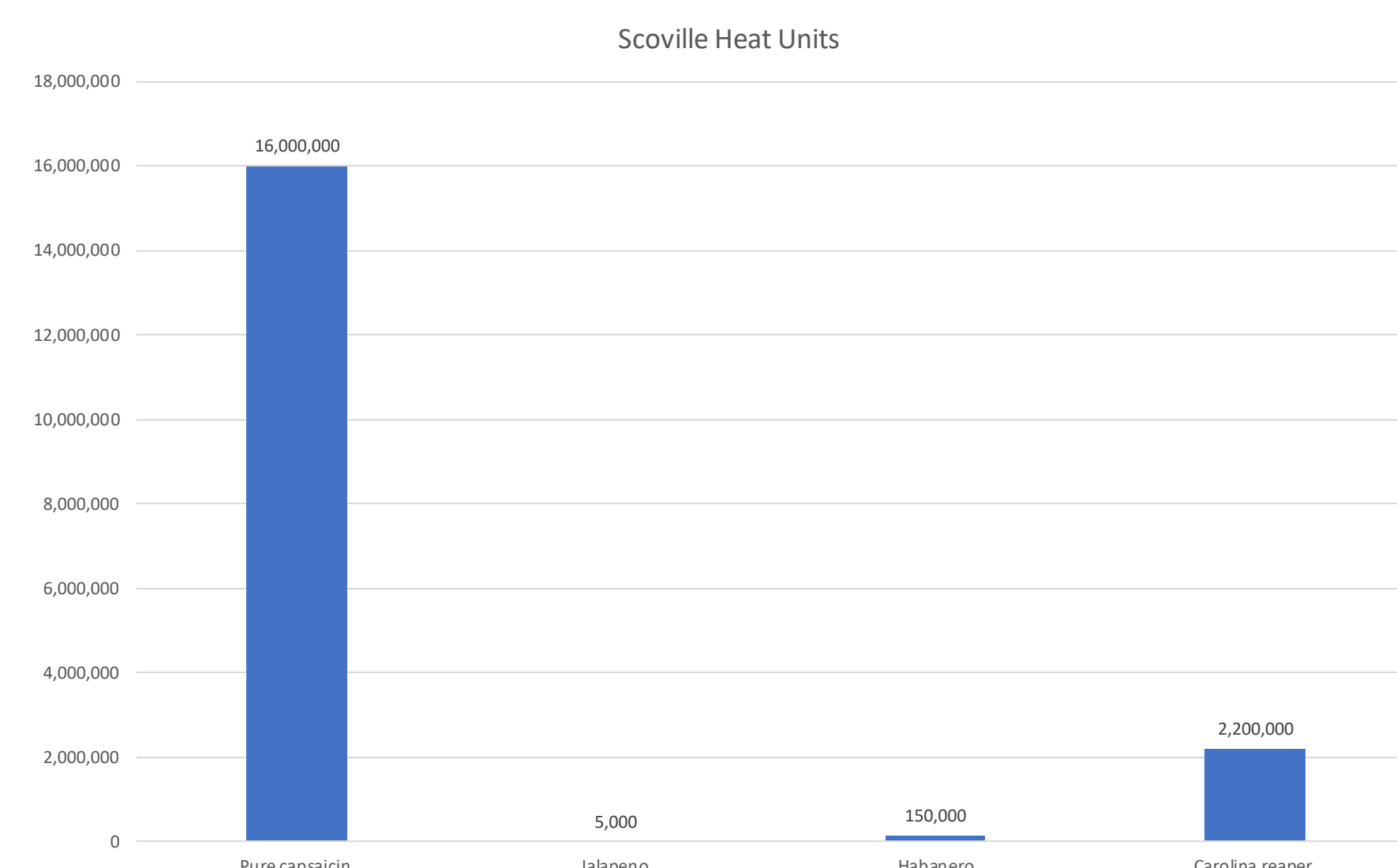
Jacquelyn Dudley, Dr. Melissa Langston

Introduction

- Capsaicin, the organic compound made up of smaller compounds known as capsaicinoids, is the well-known principle of hot peppers.

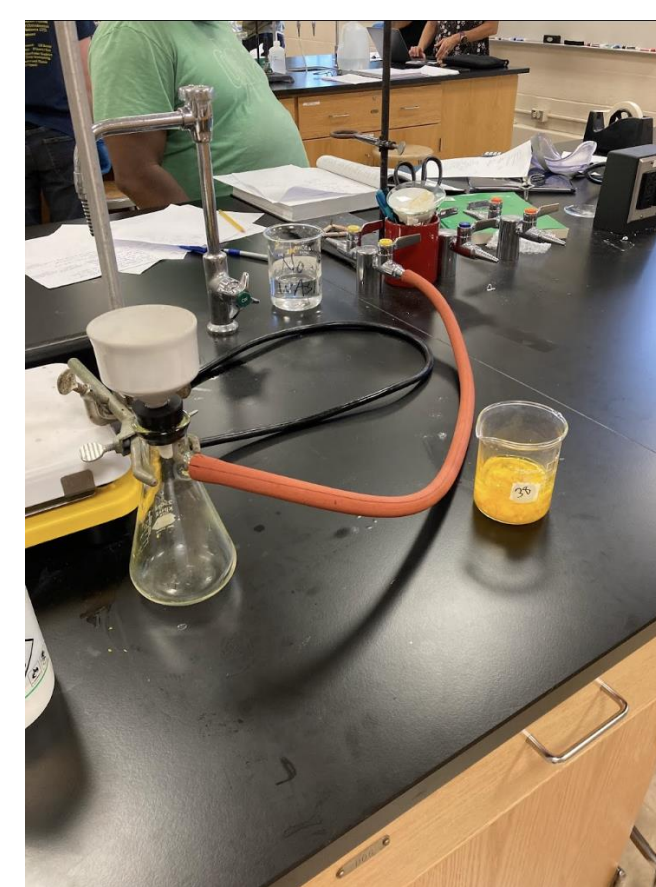
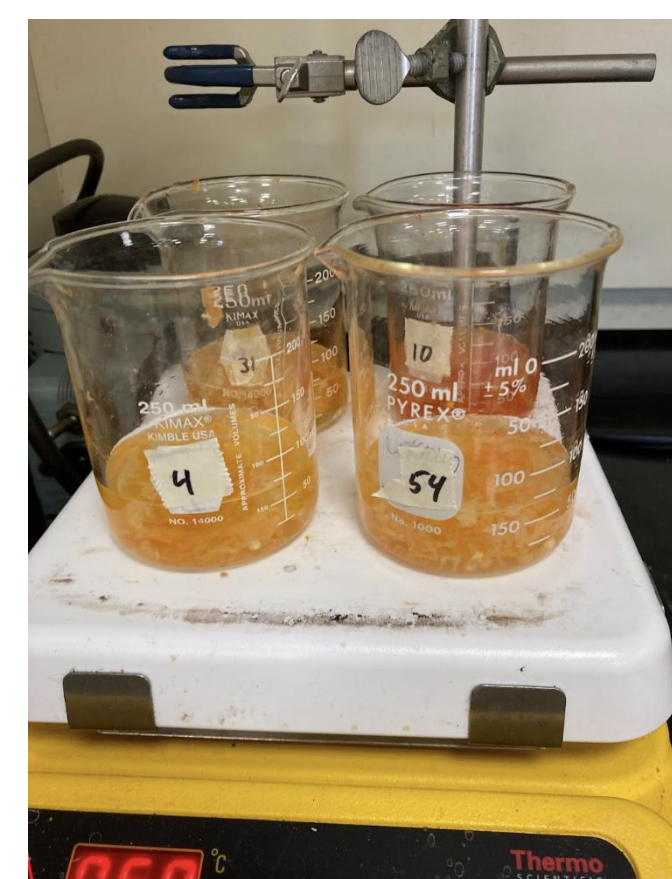
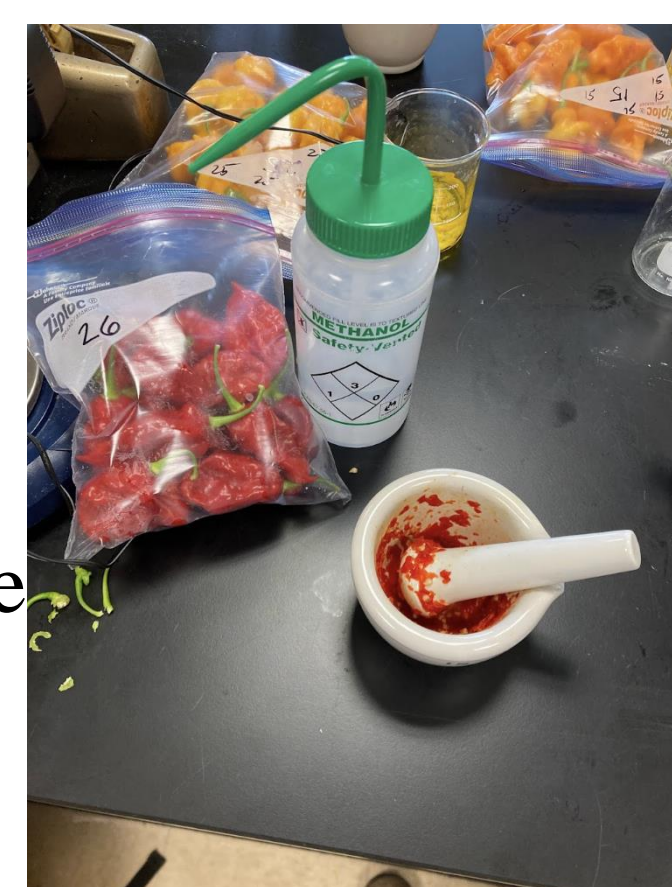


- There are a plethora of medicinal uses for capsaicin, including certain cancer treatments and arthritis creams
- Naturally occurring in chili peppers, but synthetically derived for pharmaceutical use
- Scoville Heat Units (SHU)- the measurement of the pungency of chili peppers based on the concentration of capsaicinoids



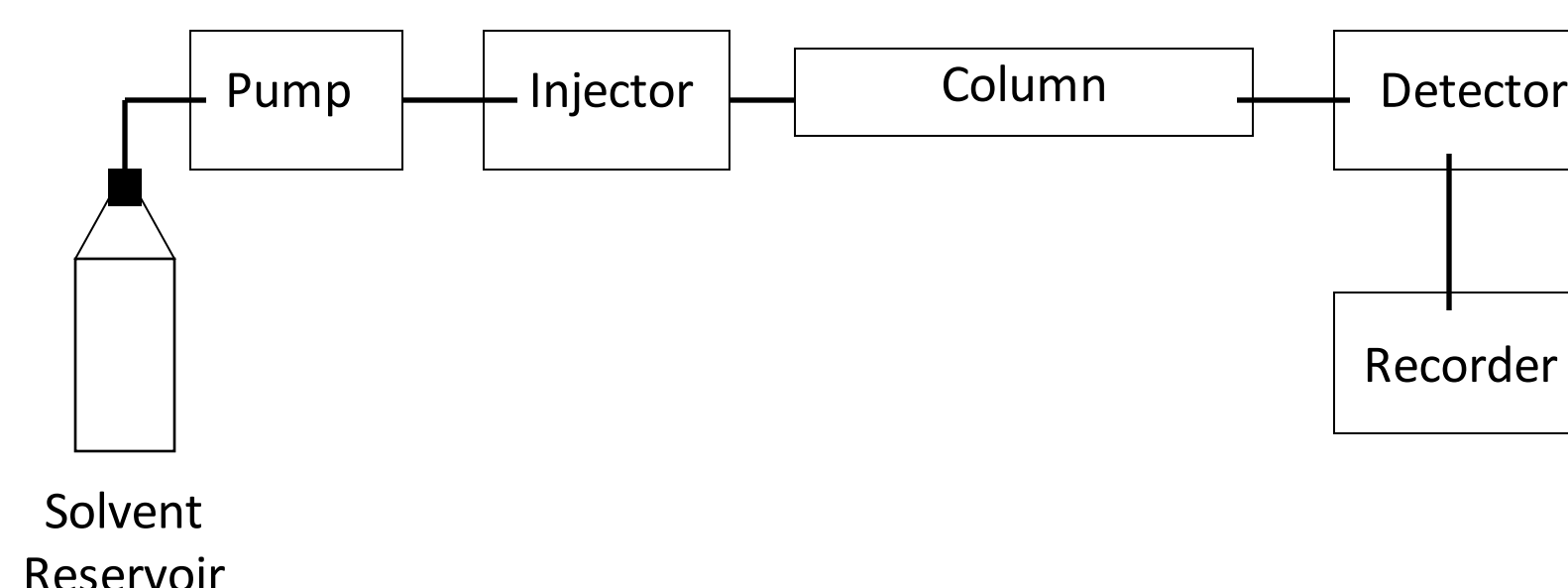
Sample Prep

1. Crush pepper using mortar and pestle
2. Use methanol to wash pulp and seeds into beaker
3. Heat beaker for one hour
4. Vacuum filter and save mixture in large tubes
5. Syringe filter in 1.5mL HPLC vials

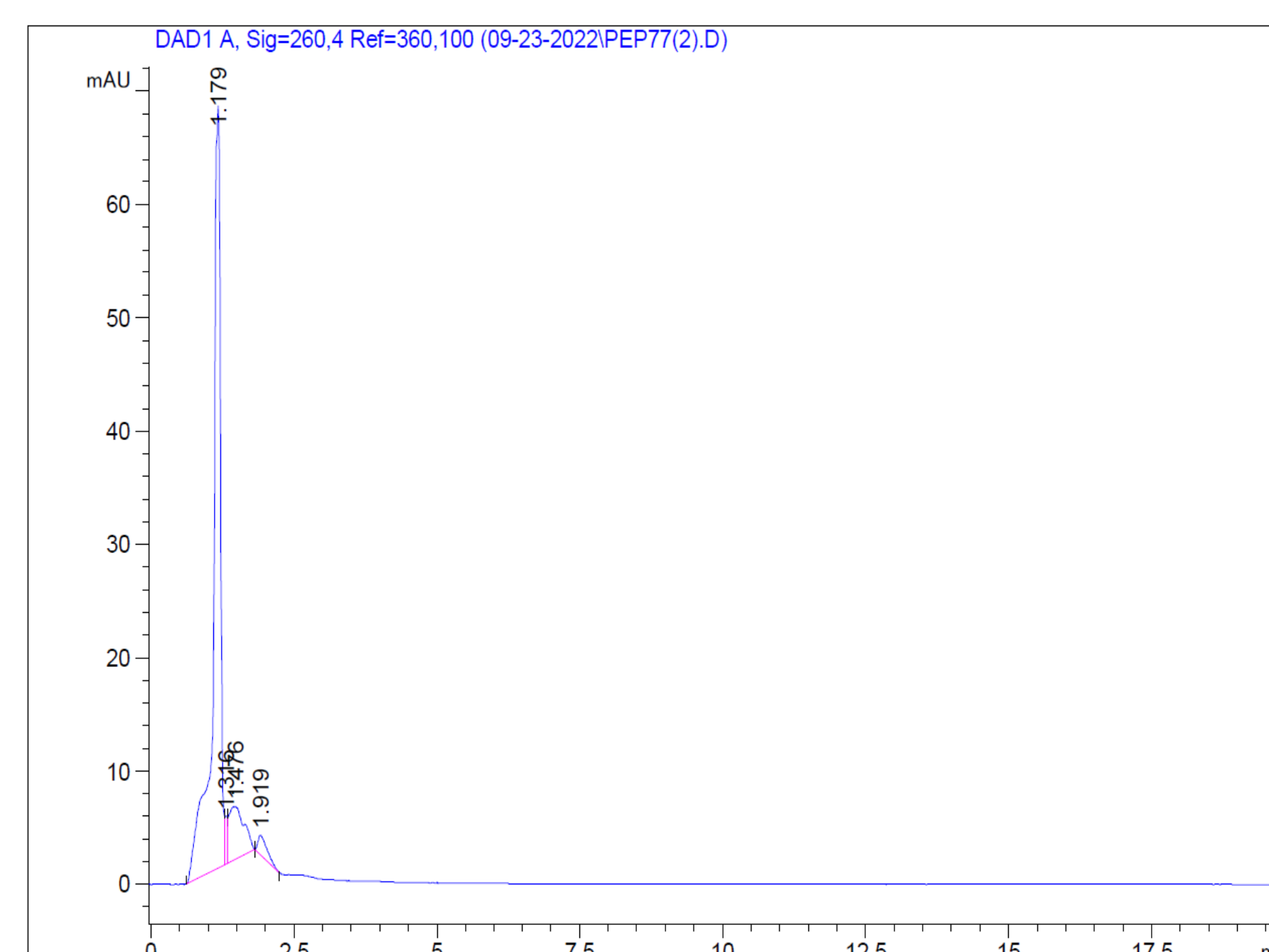


HPLC

- High Performance Liquid Chromatography
- Separate, identify, and quantify components
- Methanol and water utilized
- Nucleosil C18 column

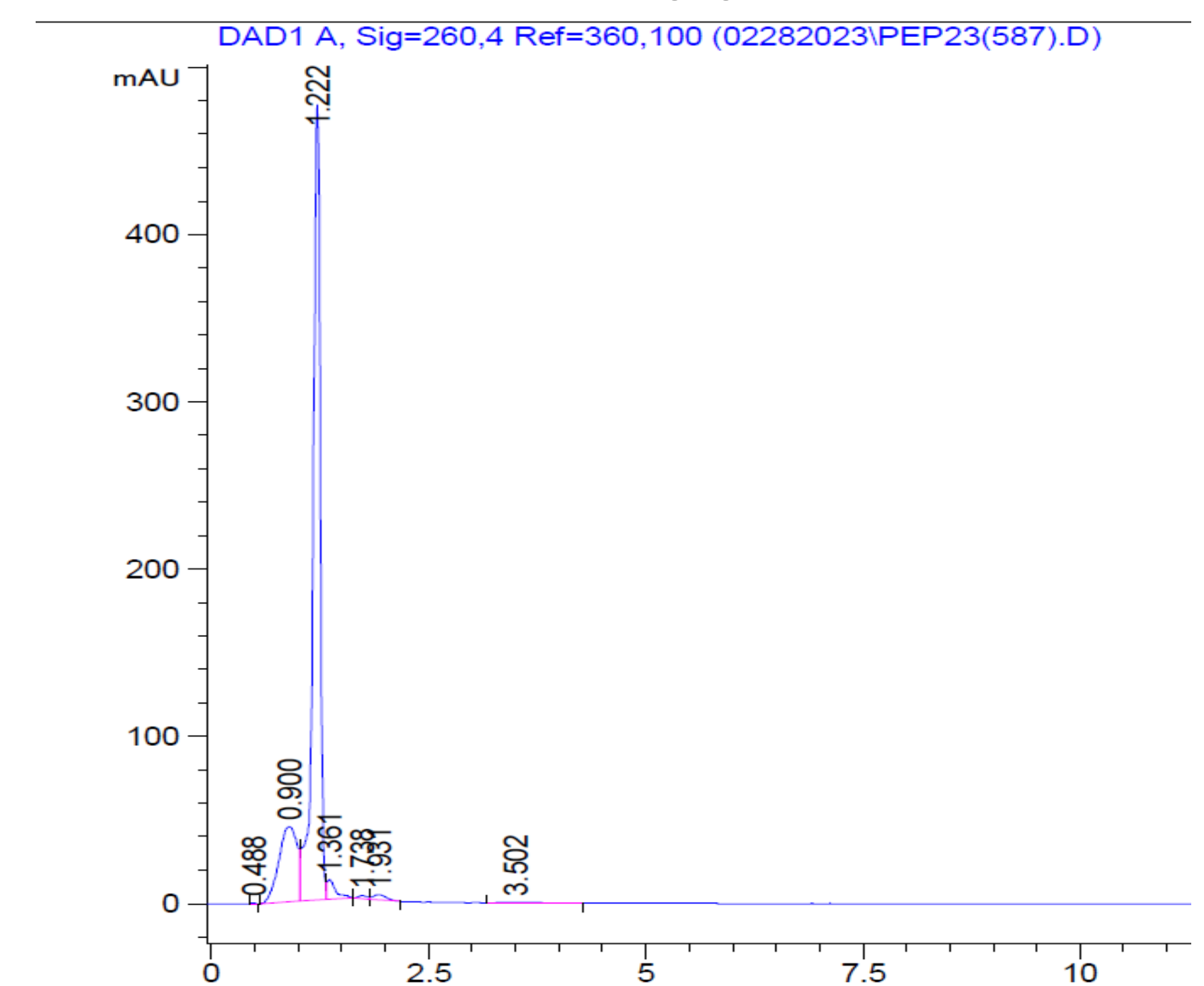


Standard Capsaicin



- The X-Axis represents the time
- The peak 1.358 minutes indicates the presence of capsaicin

Chromatogram of Sample Pepper 587



The retention times of the samples sent through the HPLC that match that of the pure capsaicin indicate the pepper contains capsaicin

Results

Plant 4(2)	Trinidad Perfume x Habanada
Plant 25(2)	Trinidad Perfume x Habanada
Plant 44(2)	Trinidad Perfume x Habanada
Plant 77(2)	Sante Fe Grande Hot x Violet Sparkle
Plant 79	Sante Fe Grande Hot x Violet Sparkle
Plant 79(2)	Sante Fe Grande Hot x Violet Sparkle
Plant 80(2)	Sante Fe Grande Hot x Violet Sparkle
Plant 82	Sante Fe Grande Hot x Violet Sparkle
Plant 86(2)	Violent Sparkle x Sante Fe Grande Hot
Plant 91(2)	Sante Fe Grande Hot x Violet Sparkle
Plant 93(2)	Sante Fe Grande Hot x Violet Sparkle
Plant 93	Sante Fe Grande Hot x Violet Sparkle

•While results from all plants were unattainable due to crop failure to fruit set, results that were obtainable indicate the following:

- Plants that previously tested positive for capsaicin continued to test positive in the next generation
- Concentration levels were similar between generations
- Highlighted data tested positive for similar capsaicin concentrations as parent generations

Future Work

- Continue to monitor heat transfer between generations]
- Analyze effects of growing conditions on capsaicin concentrations
- In depth look into capsaicin synthase

Acknowledgements

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