The Hibiscus Bud Weevil (*Anthonomus testaceosquamosus*) Biology & Ecology

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UF | UNIVERSITY of FLORIDA

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USDA ARS

NATIONAL HORTICULTURE FOUNDATION

The Hibiscus Bud Weevil (HBW) (*Anthonomus testaceosquamosus*)

- Native to northeastern Mexico and southern Texas
- First detection in FL in 2017
- Present in Miami-Dade, Broward and Hernando counties
- A regulated pest!

PEST ALERT

FDACS-P-01883

Pest Alert created May 2018

Florida Department of Agriculture and Consumer Services
Division of Plant Industry

***Anthonomus testaceosquamosus* Linell, the hibiscus bud weevil, new in Florida**

Paul E. Skelley; Bureau of Entomology, Nematology and Plant Pathology
Lance S. Osborne; UF/IFAS Mid-Florida Research and Education Center
DPIHelpline@FreshFromFlorida.com or 1-888-397-1517

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The Hibiscus Bud Weevil (HBW)

Photo: Y. Velazquez Hernandez

Photo: D. Carrillo

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Female vs. Male HBW

♀

♂

Revynthi et al., EDIS 2021, pp. 1–7.

Photo: D. Carrillo

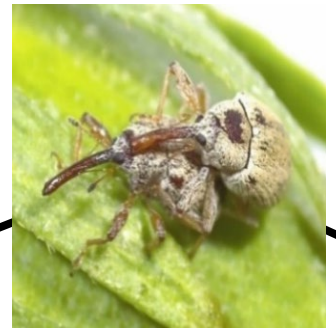
HBW Damage

Photos: Y. Velazquez Hernandez & J. Rodriguez

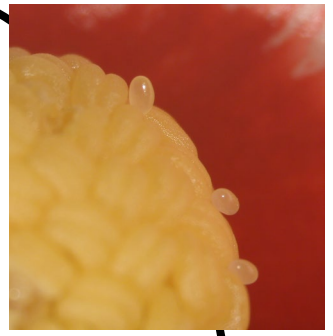
HBW Damage

Photos: Y. Velazquez Hernandez & G. Vargas

HBW Life Cycle

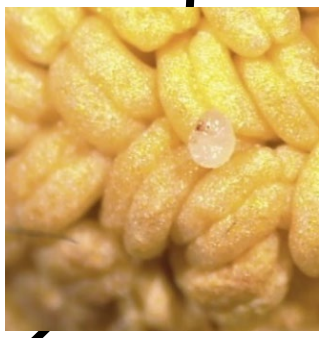


Adult



Egg

3.35 ± 0.31 days



1st instar larva (L1)

2.6 ± 0.24 days

2nd instar larva (L2)

3.73 ± 0.48 days

3rd instar larva (L3)

2.05 ± 0.19 days

Pupa

4.1 ± 0.27 days

HBW Life cycle
27°C (80 °F)

15.78 ± 0.83 days

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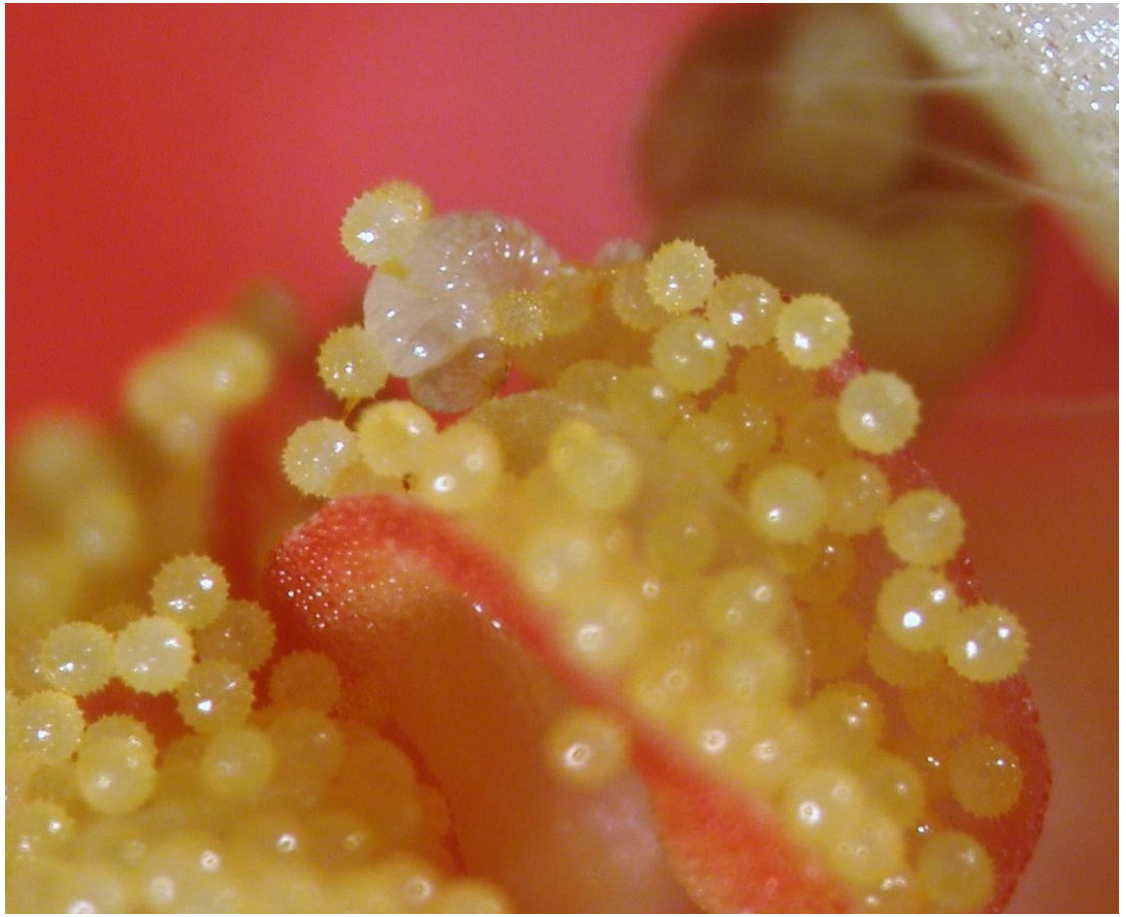
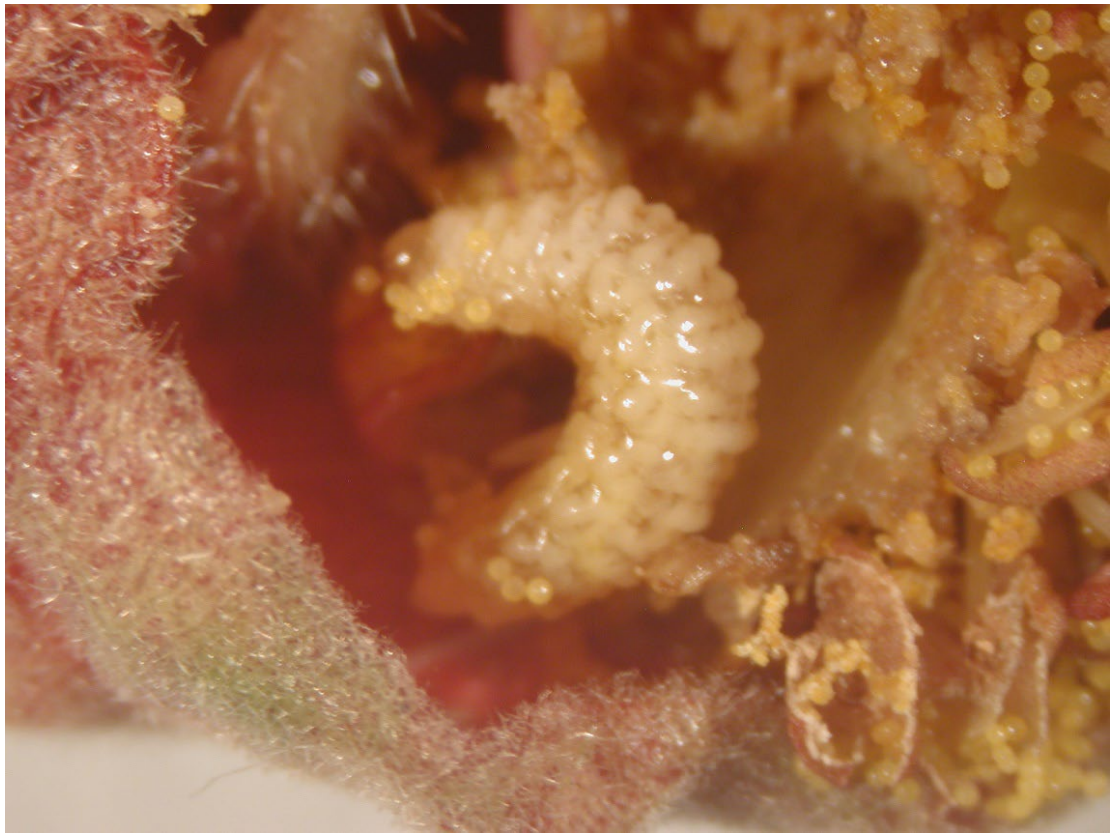
Revynthi et al., 2022, Insects: 13 (13), 1-14

Weevil larva feeding on pollen spores being released by the anthers



Photos: Y. Velazquez Hernandez, J. Rodriguez & C. Mannion

Larvae feed on pollen and ultimately forms a cocoon-like cell to pupate



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Photos: Y. Velazquez Hernandez, J. Rodriguez & C. Mannion

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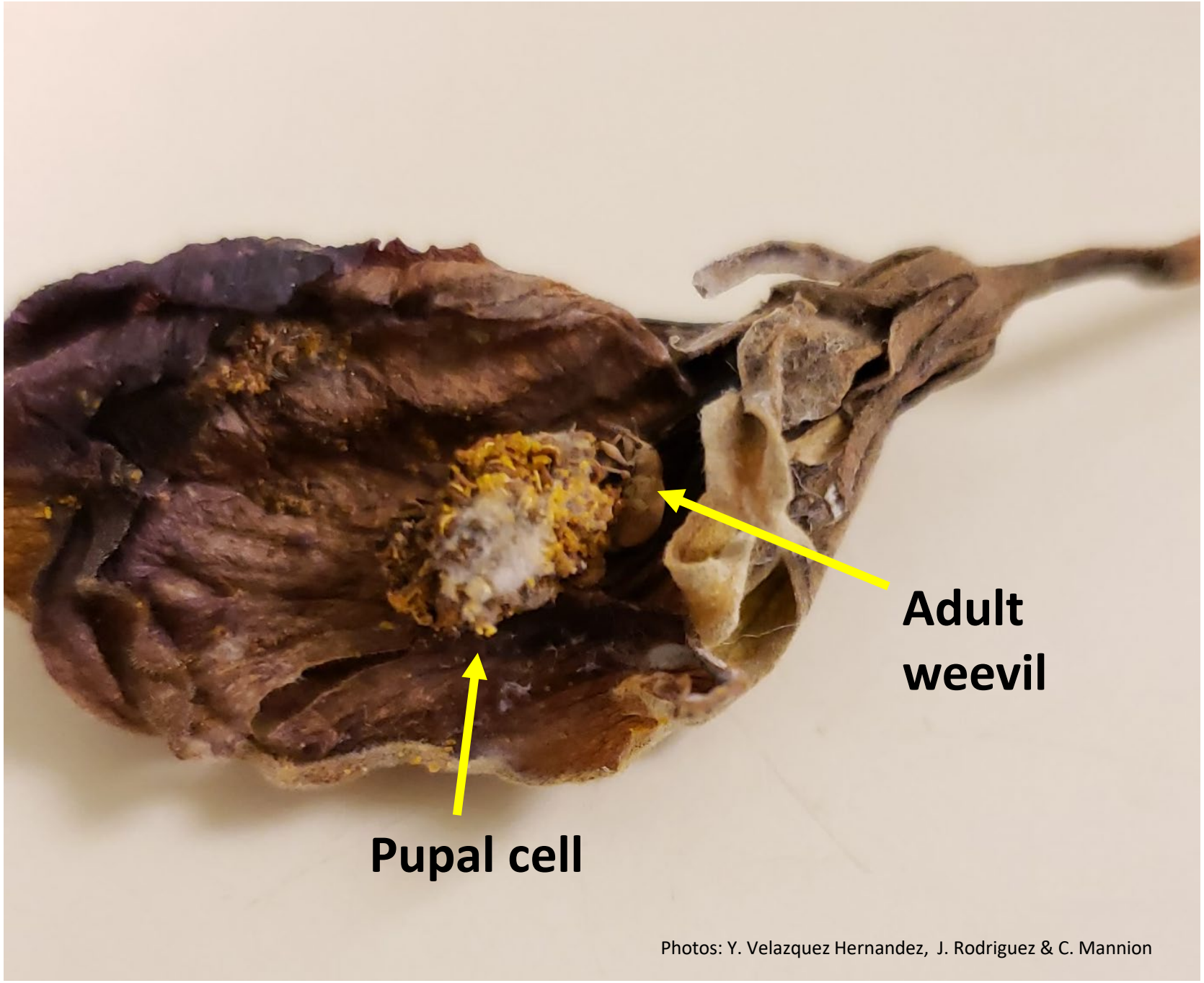

Photos: Y. Velazquez Hernandez, J. Rodriguez & C. Mannion

Hibiscus Bud Midge

- “Gnat”
- Causes bud drop

Photo: Y. Velazquez

Photos: C. Mannion

Hibiscus bud weevil larva

Hibiscus bud weevil pupa

Hibiscus Bud Weevil
Vs.
Hibiscus Bud Midge

Hibiscus bud midge larva

Hibiscus bud midge pupa

Photos: C. Mannion

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Effect of Temperature on HBW Development

Temperat. (°F)	Egg	First Instar	Second Instar	Third Instar	Pupa	Egg to Adult
50	78.2 ±0.55	X	X	X	X	X
55	13 ± 1.33	4.9 ± 0.86	12.75 ± 2.46	87 ± 14.01	X	X
80	3.35 ±0.31	2.6 ± 0.24	3.73 ±0.48	2.05 ±0.19	4.1 ± 0.27	15.78 ±0.83
93	5.5 ± 0.29	2.53 ± 0.29	8.92 ± 1.3	25.5 ±8.86	X	X

Revynthi et al., 2022, Insects: 13 (13), 1-14

Reproduction of the HBW

- At 80 F on average 5.9 eggs/Female/Day
- Require mating
- They cannot reproduce when feed only on pollen

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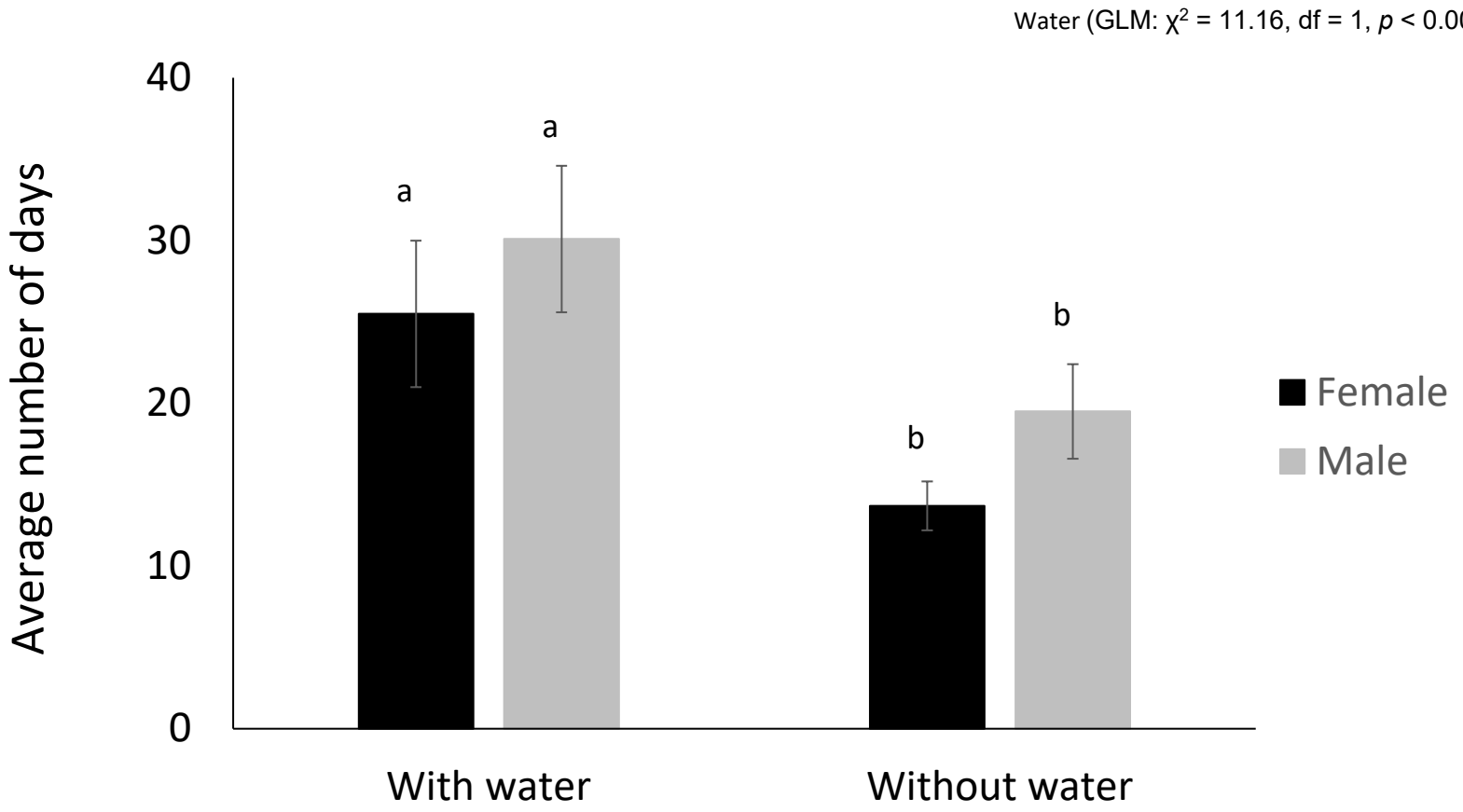
Longevity of the HBW

- When virgin, females live longer than males
  - ♀ 109 and ♂ 86 days

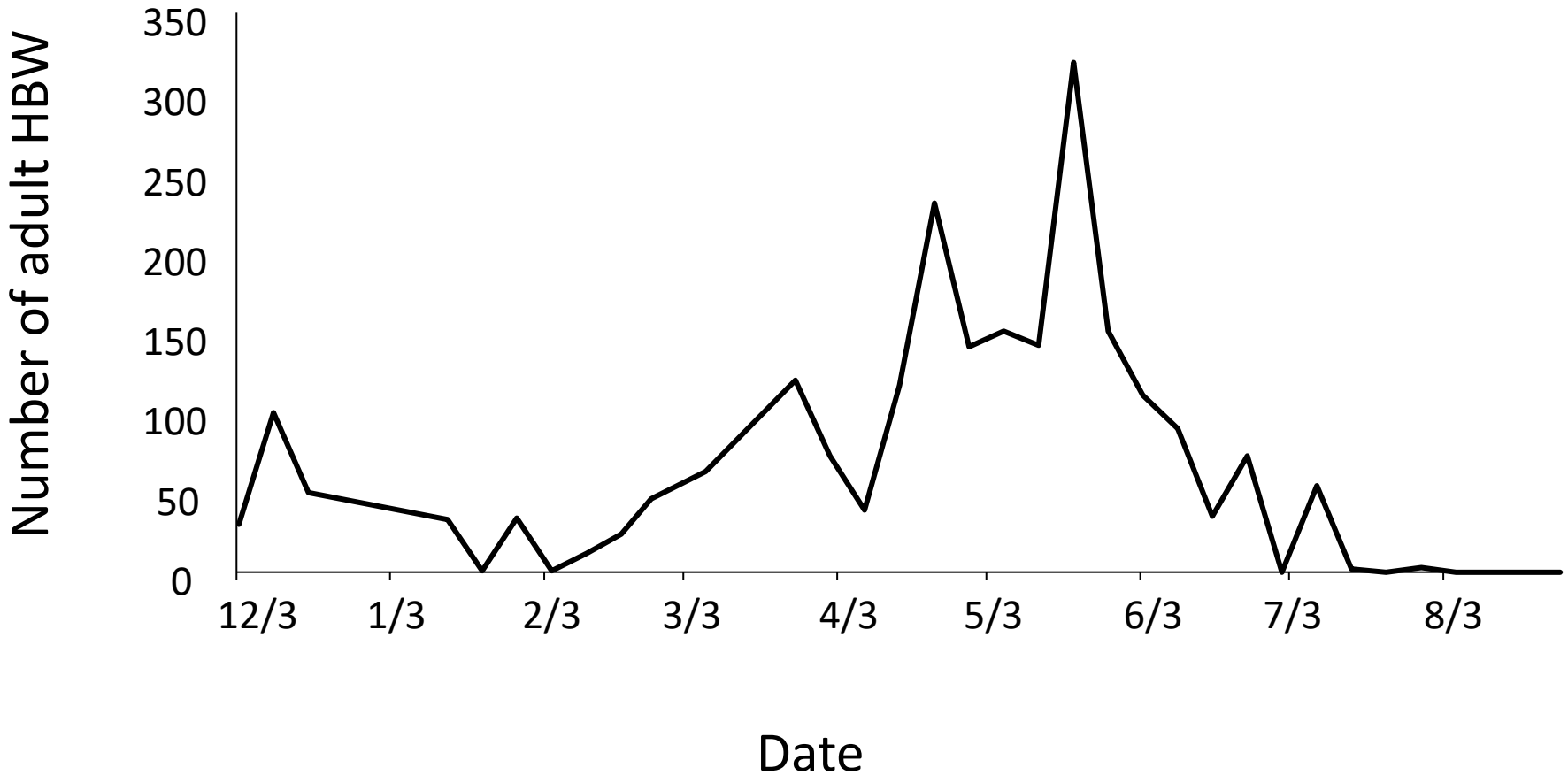
- When mated males live longer than females
  - ♀ 47 and ♂ 111 days

Survival With and Without Water



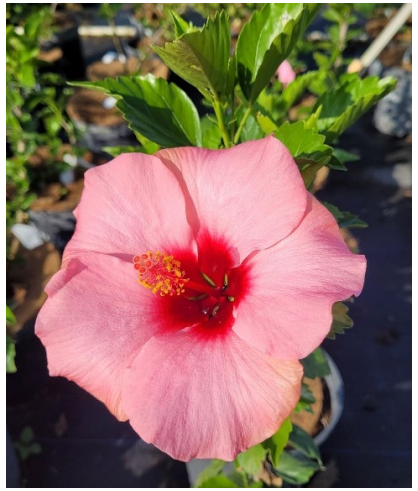
Revynthi et al., 2022, Insects: 13 (13), 1-14

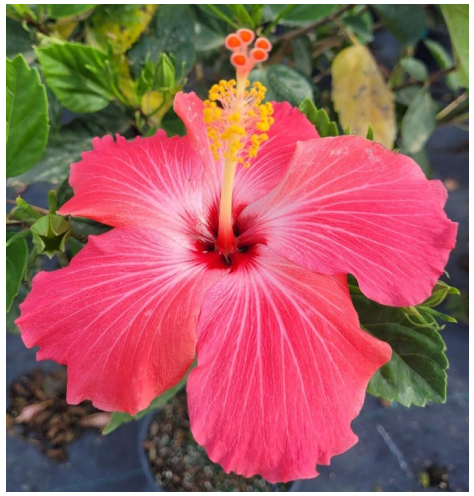
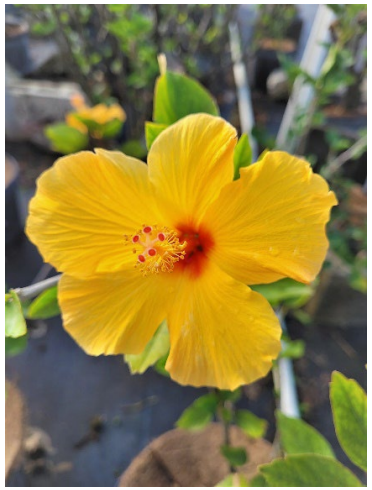
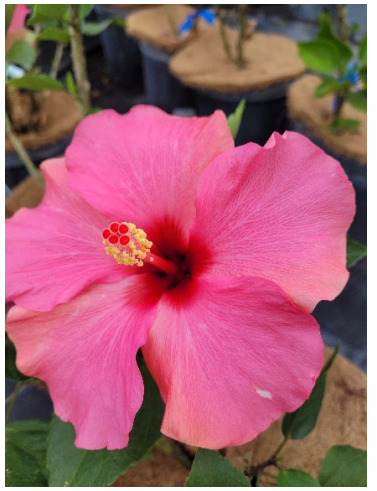
Population Dynamics of HBW in Nurseries



HBW Plant Preference

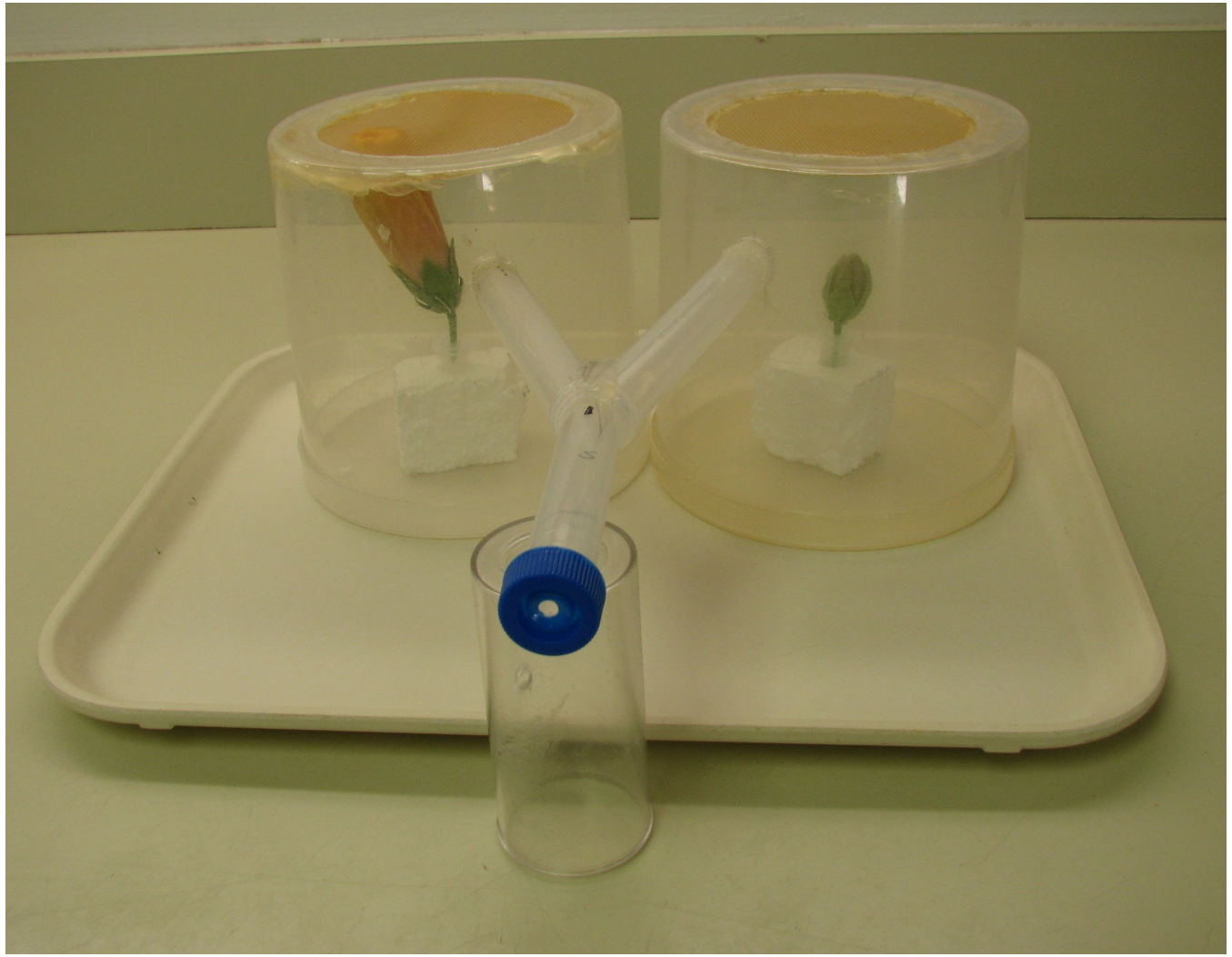
- Which plant parts does the HBW prefer?
- Does the HBW have a preferred variety?



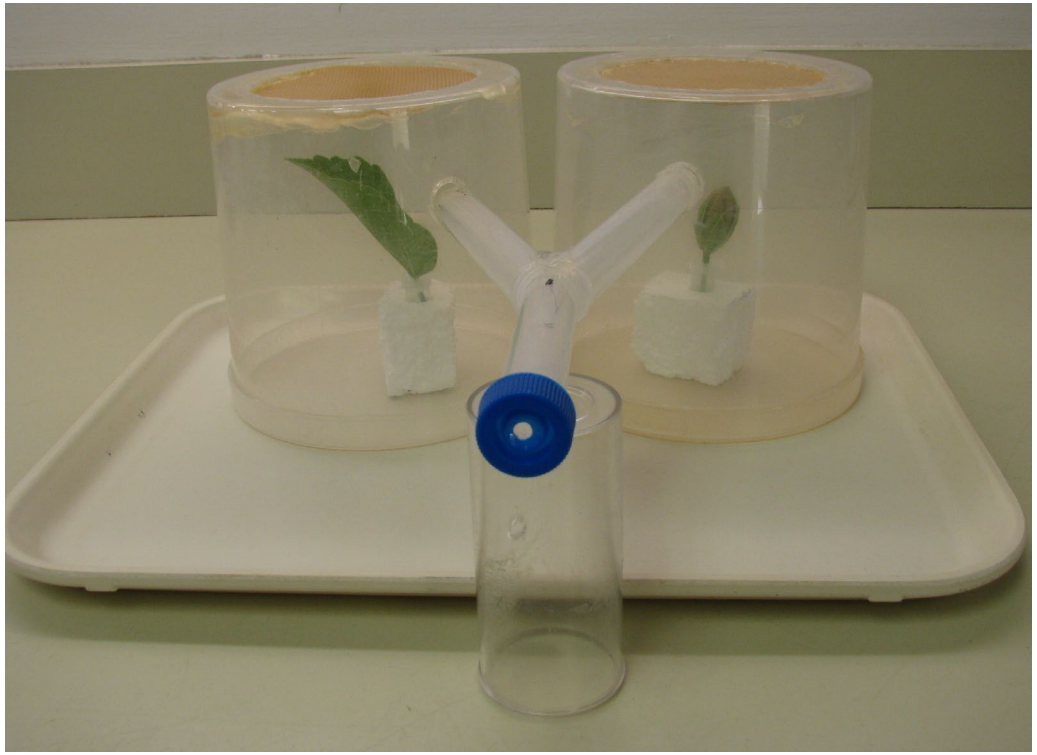




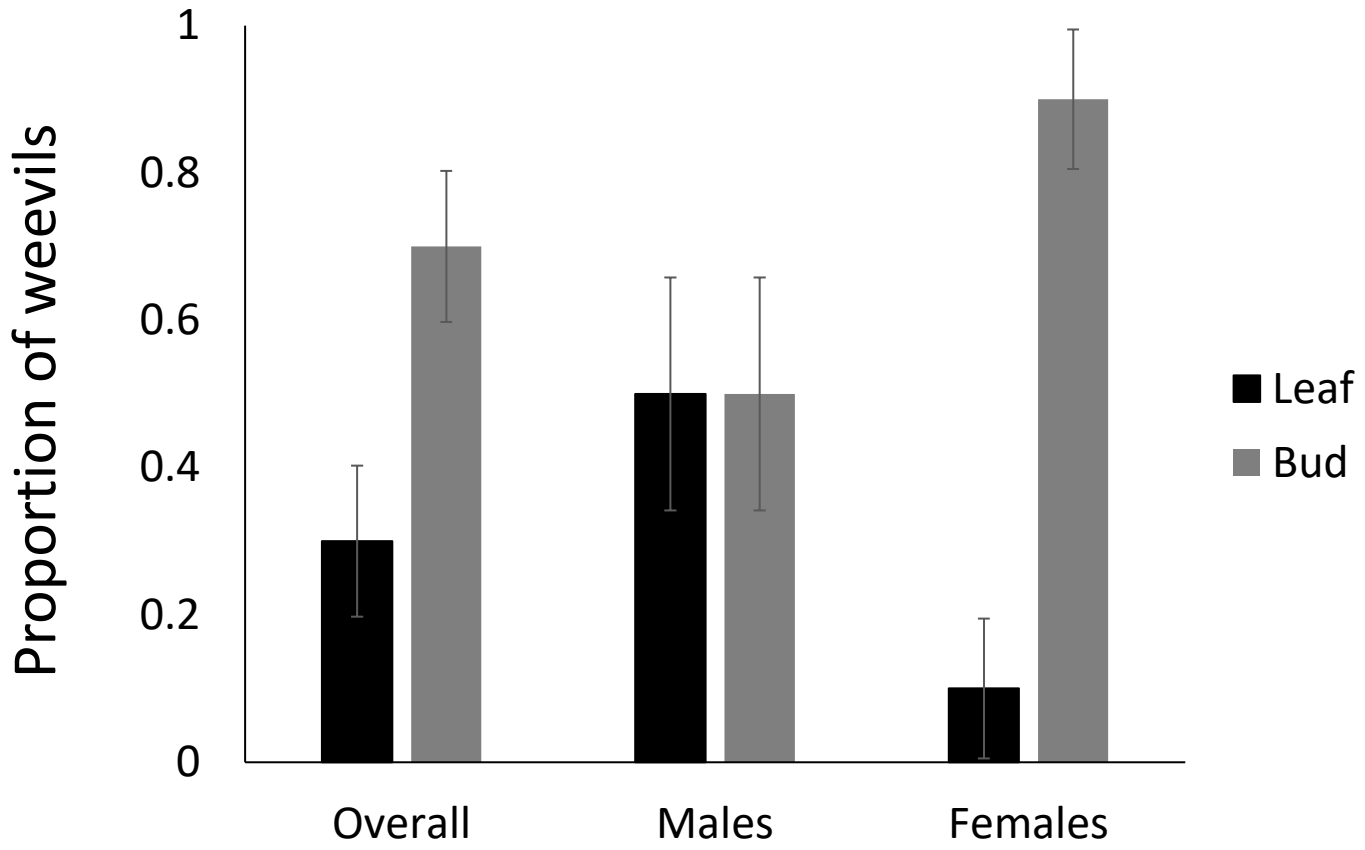
Plant part Preference

- Buds, Leaves, Flowers
- Males and Females
- ‘Tequila’ variety
- N = 20 replicates / combination

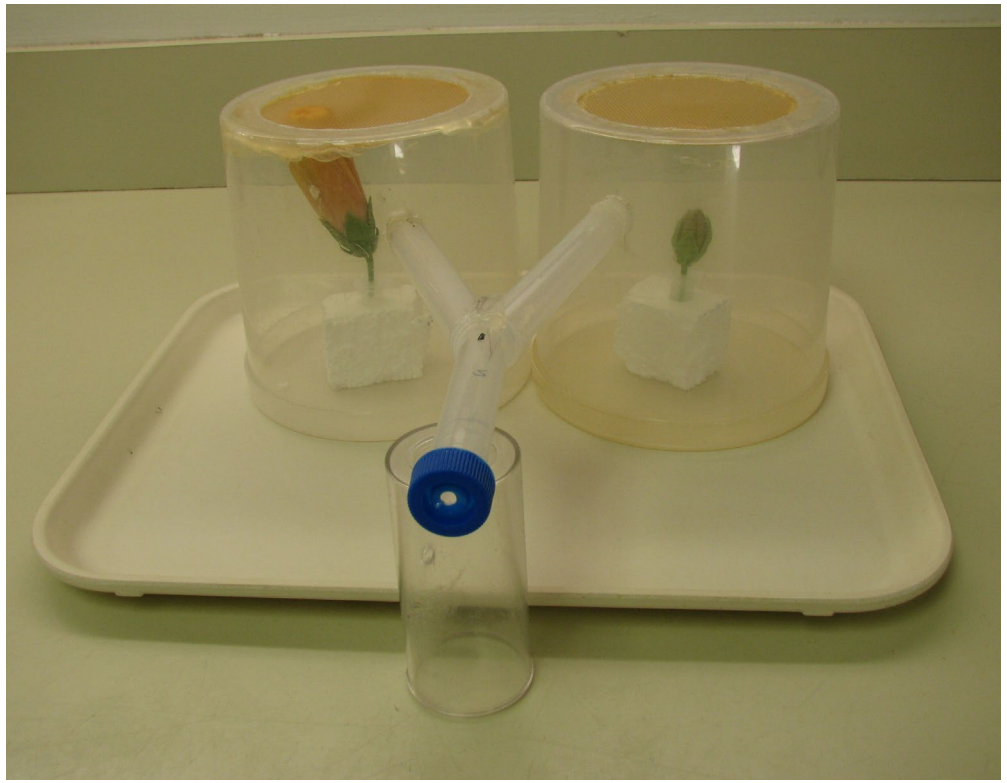


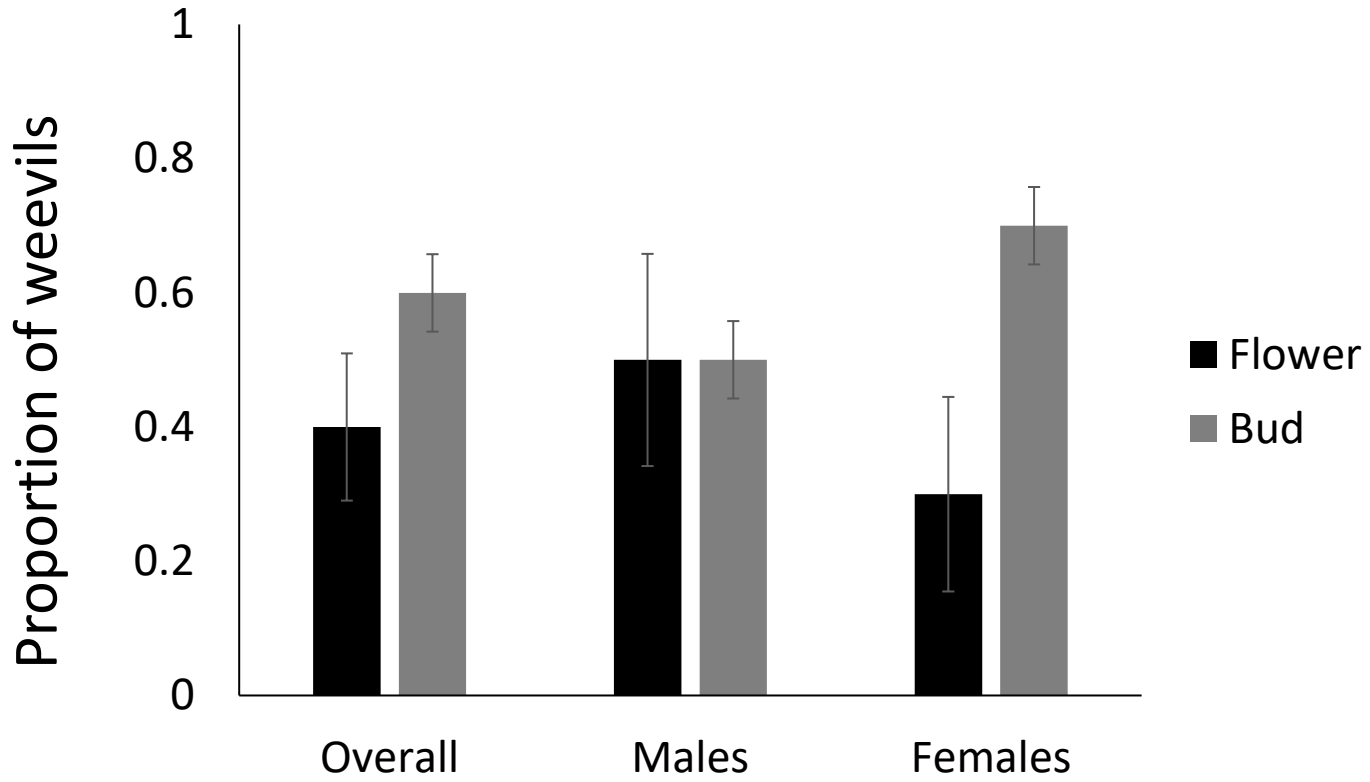
Leaf vs. Bud



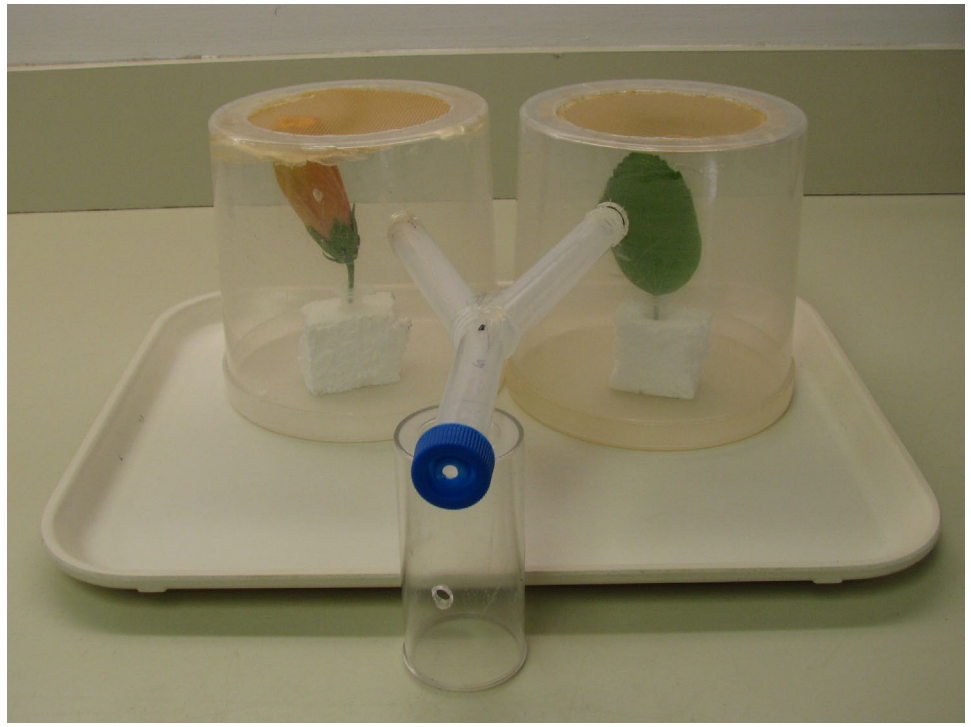

Proportion of weevils
1
0.8
0.6
0.4
0.2
0
Overall
Males
Females
Leaf
Bud

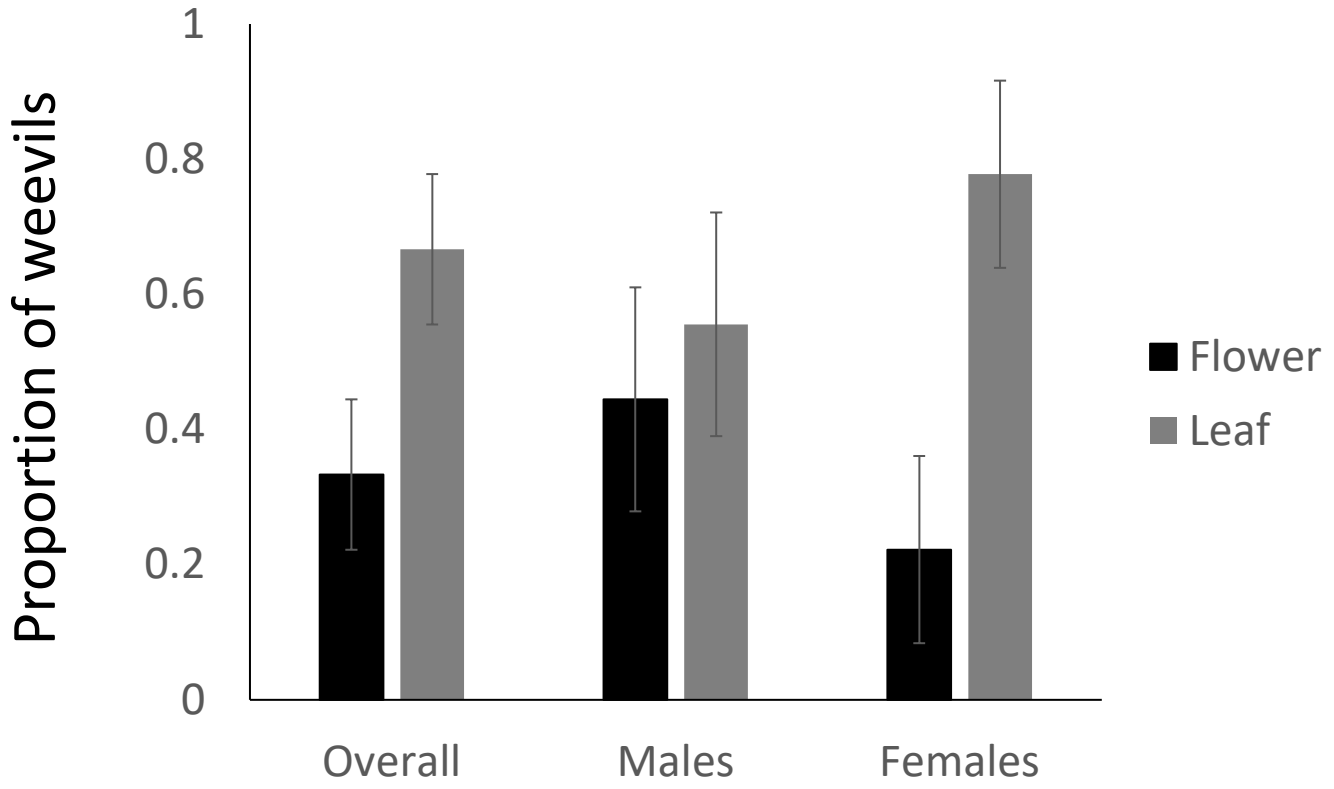
Flower vs. Bud





Flower vs. Leaf





Single vs. Double Varieties

- Weevils can feed and damage both varieties
- Preference for single over double varieties

Single variety

Double variety

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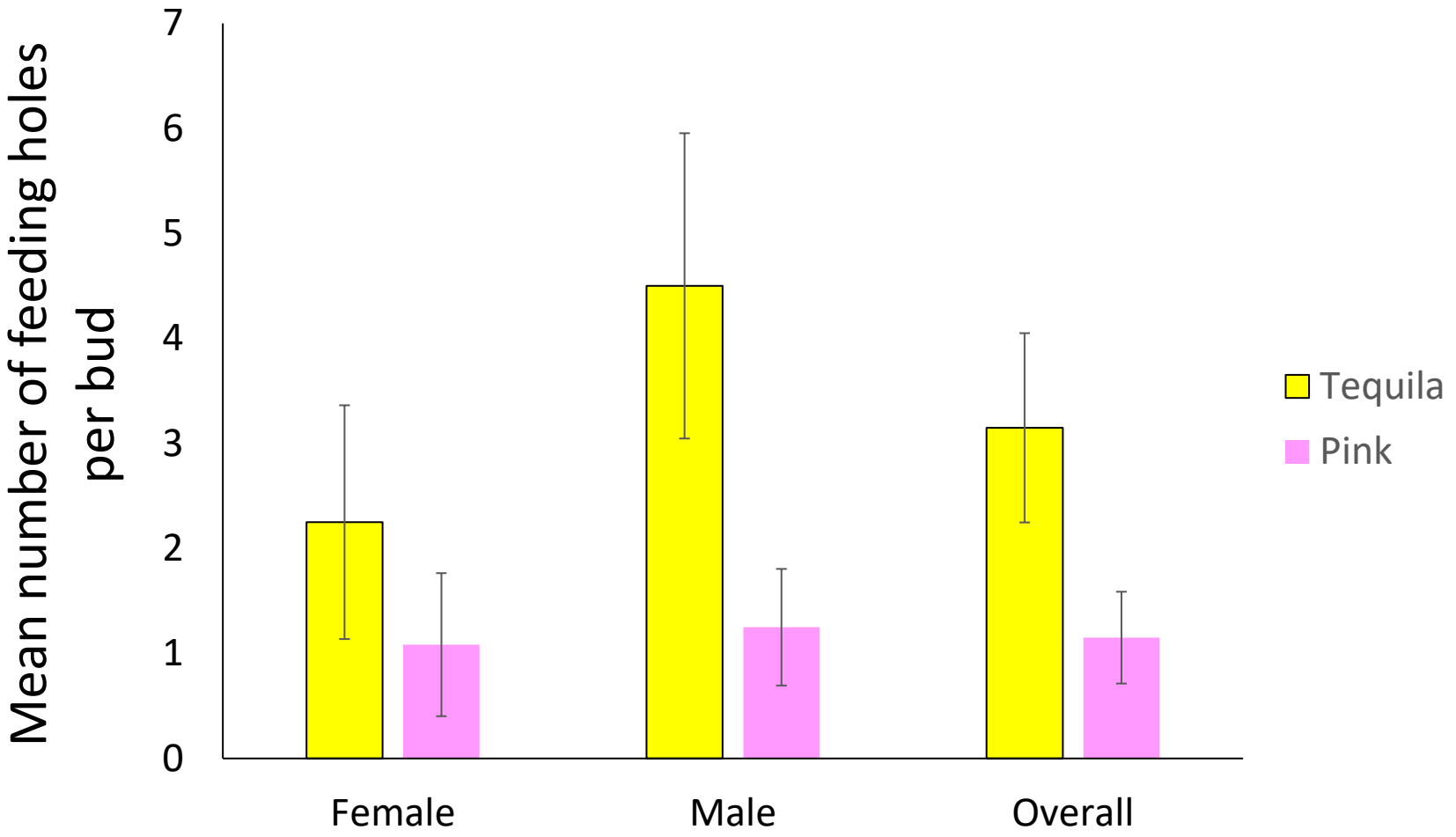
Preference for different varieties

- First round: Painted Lady, Tequila, Seminole Pink
- One bud of each variety + one weevil
- Males and Females
- N = 20 replicates / combination

Tequila vs Seminole Pink



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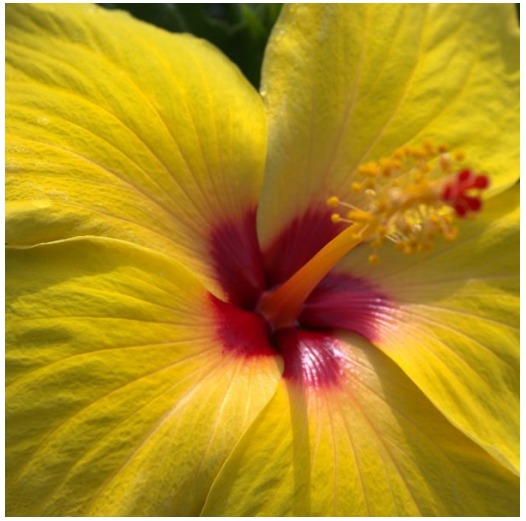
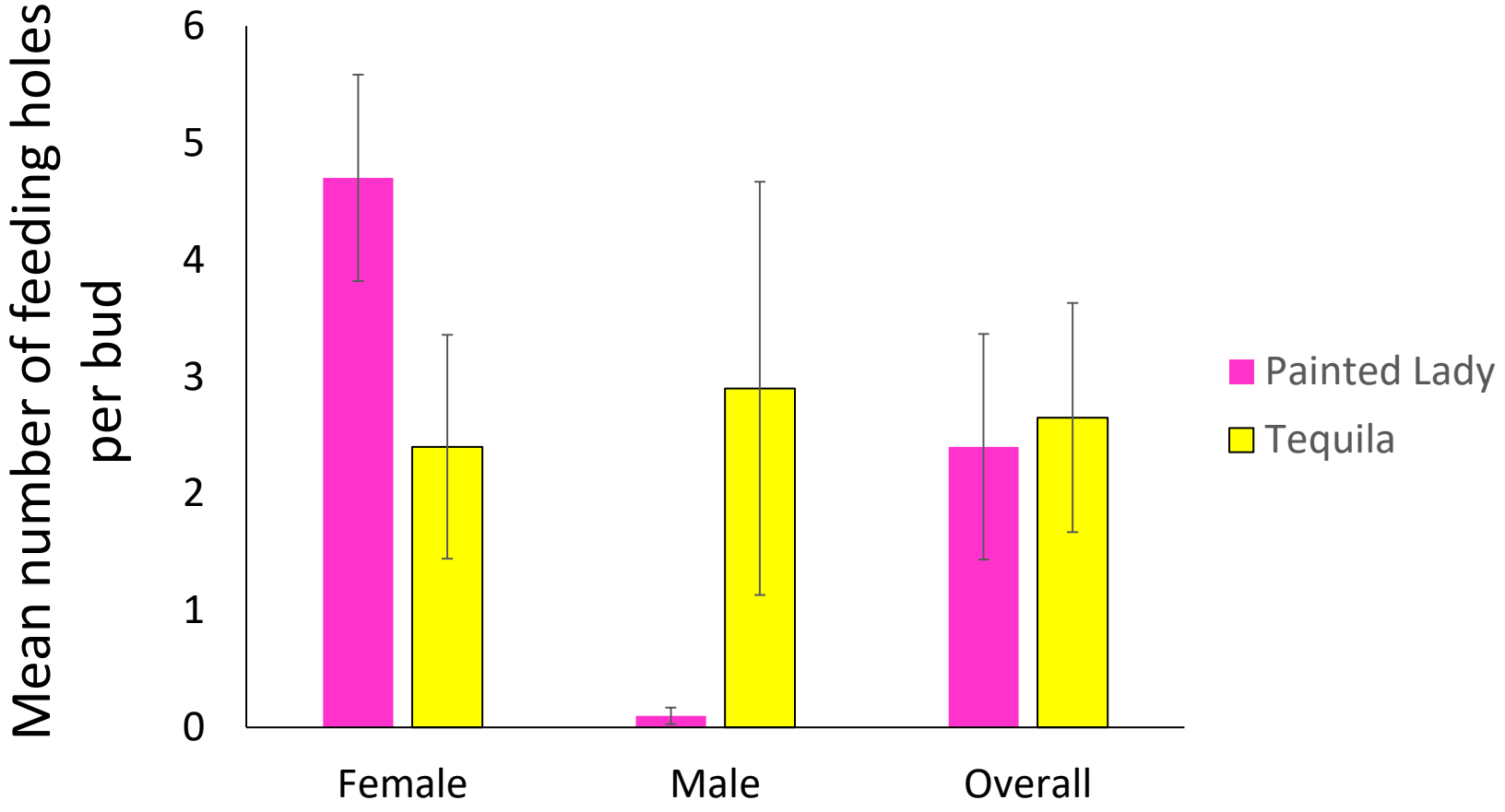
Painted Lady vs Tequila





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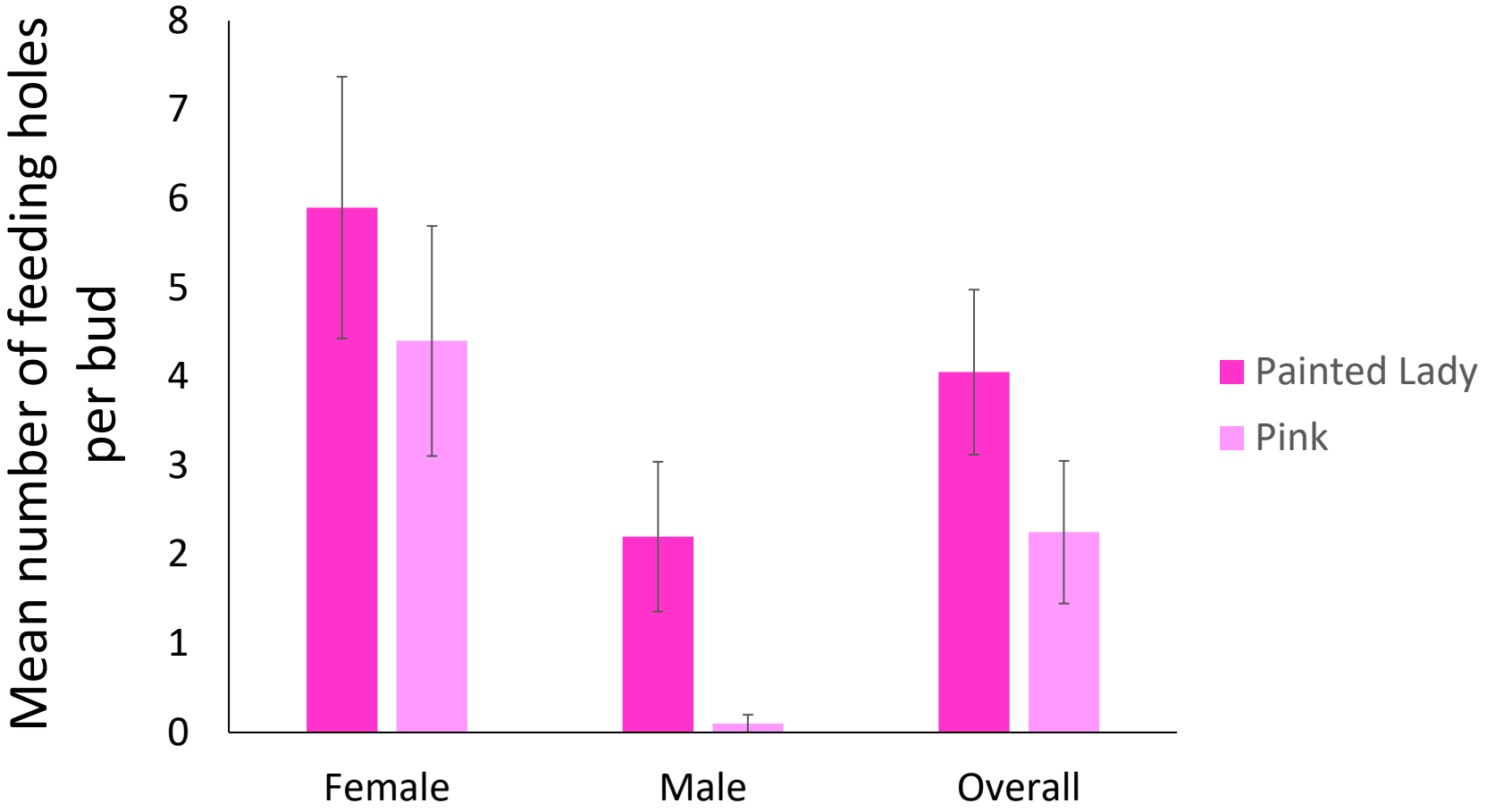
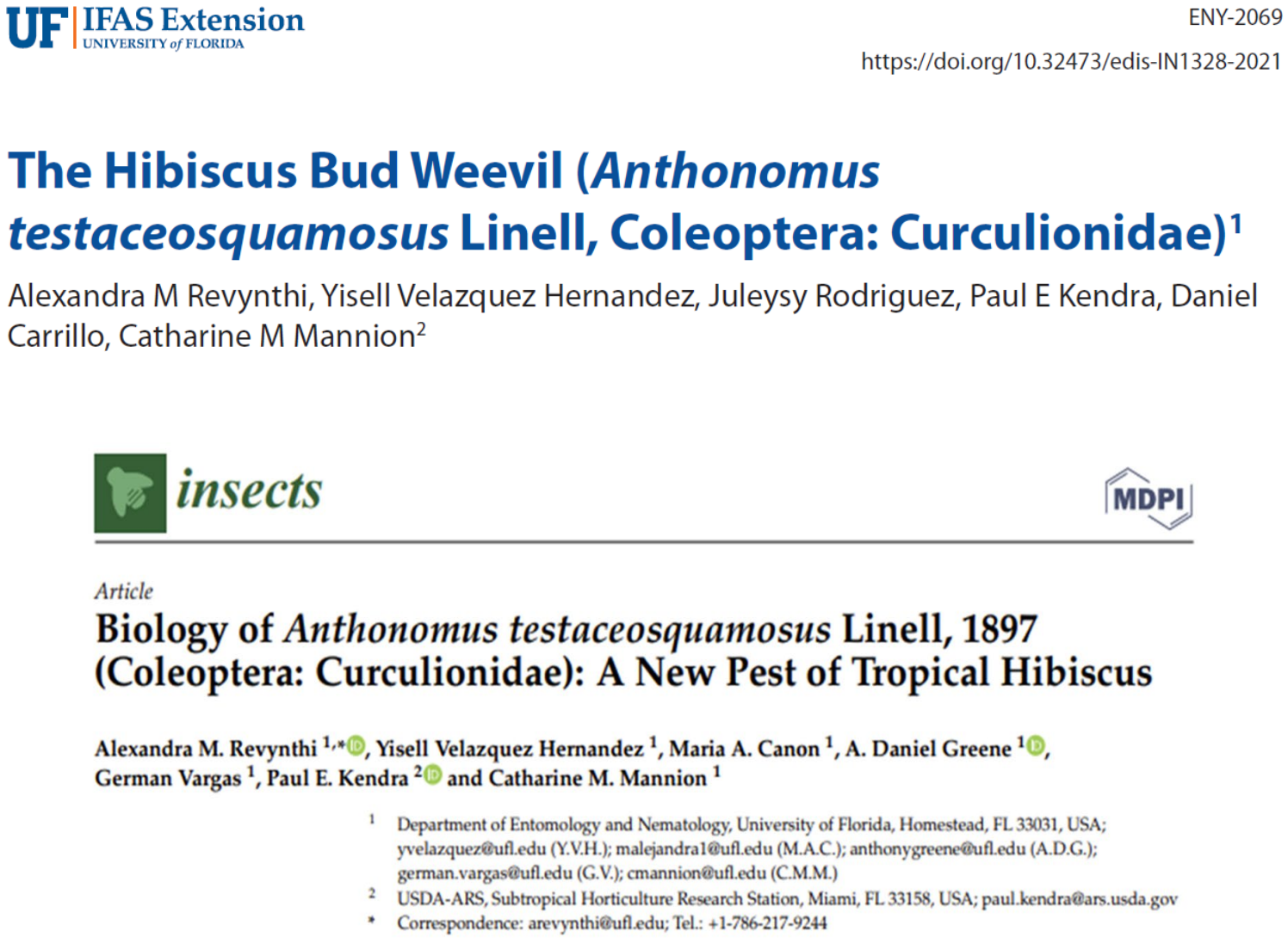
Painted Lady vs Seminole Pink



Take-home messages

- HBW can successfully complete its life cycle within 2 wks. at 80 °F
- HBW can survive only on hibiscus pollen and water, but cannot lay eggs
- HBW has preference for certain varieties



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The Hibiscus Bud Weevil (*Anthonomus testaceosquamosus* Linell, Coleoptera: Curculionidae)[1]

Alexandra M Revynthi, Yisell Velazquez Hernandez, Juleysy Rodriguez, Paul E Kendra, Daniel Carrillo, Catharine M Mannion[2]

insects

MDPI

Article

Biology of *Anthonomus testaceosquamosus* Linell, 1897 (Coleoptera: Curculionidae): A New Pest of Tropical Hibiscus

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Future Research

- Alternatives hosts (okra)
- Screen various hibiscus varieties- UF/TREC Dr. Xingbo Wu
- Population dynamics and spatial distribution – Dr. Daniel Greene

Thank you!

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Florida Nursery and Landscape Association

Miami-Dade County Agricultural Manager's Office

Hibiscus Bud Weevil Task Force

NACA: 58-6038-8-004