



Unicorn Poop and Crown Royal: The effect of cultivar and temperature on the management of cannabis aphid

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Cannabis sativa L.

- Hemp \leq **0.3% Δ 9-THC** < Cannabis
(Delta-9-tetrahydrocannabinol)
- Recreational use legalized in 2018
 - 139 hectares of indoor production
 - 624 hectares of outdoor production
- \$5.2B in recreational sales (2023)

New crop = important knowledge gaps



Cannabis Aphid

(*Phorodon cannabis* Passerini)

- Specialist of *C. sativa*
 - No other known host plant
- First recorded in North America in 2015
- Significant yield losses from contamination

Objective 1: Biology

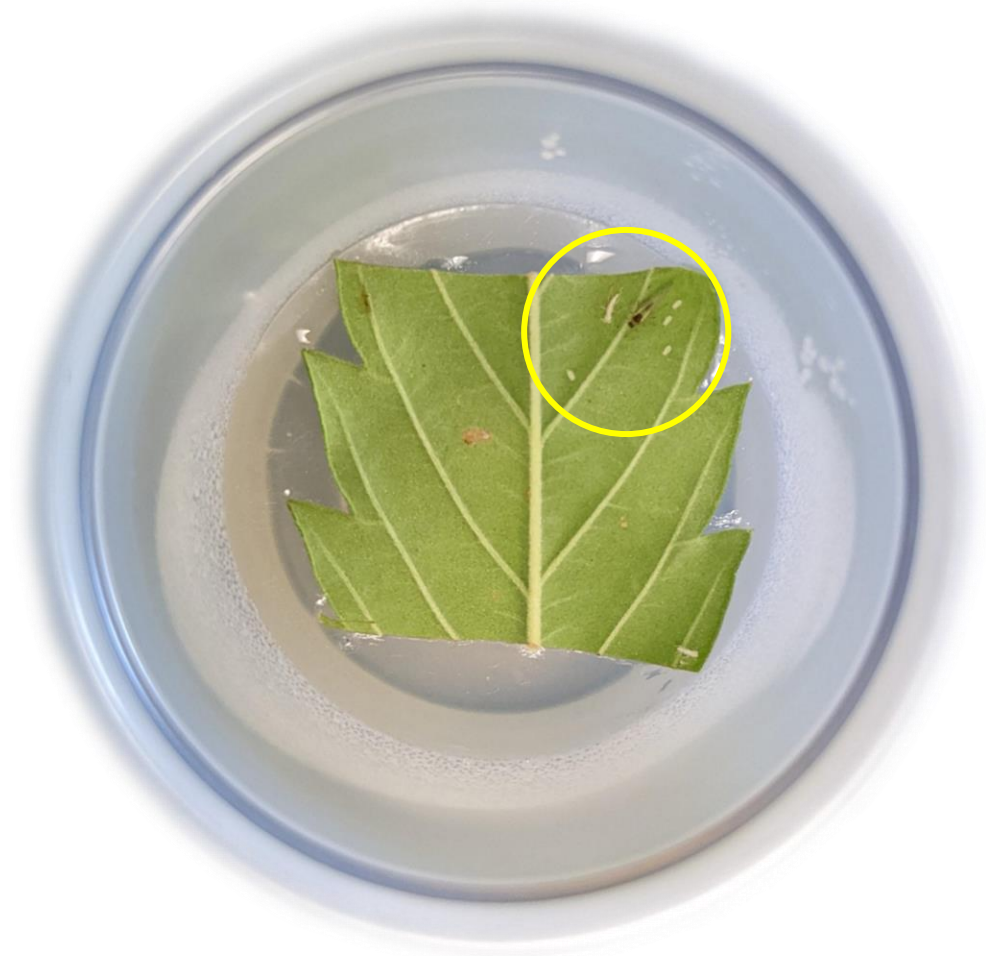
- How do temperature and cultivar affect the biology of cannabis aphid?

Objective 2: Management

- Can parasitoids be an effective tool to manage cannabis aphid?

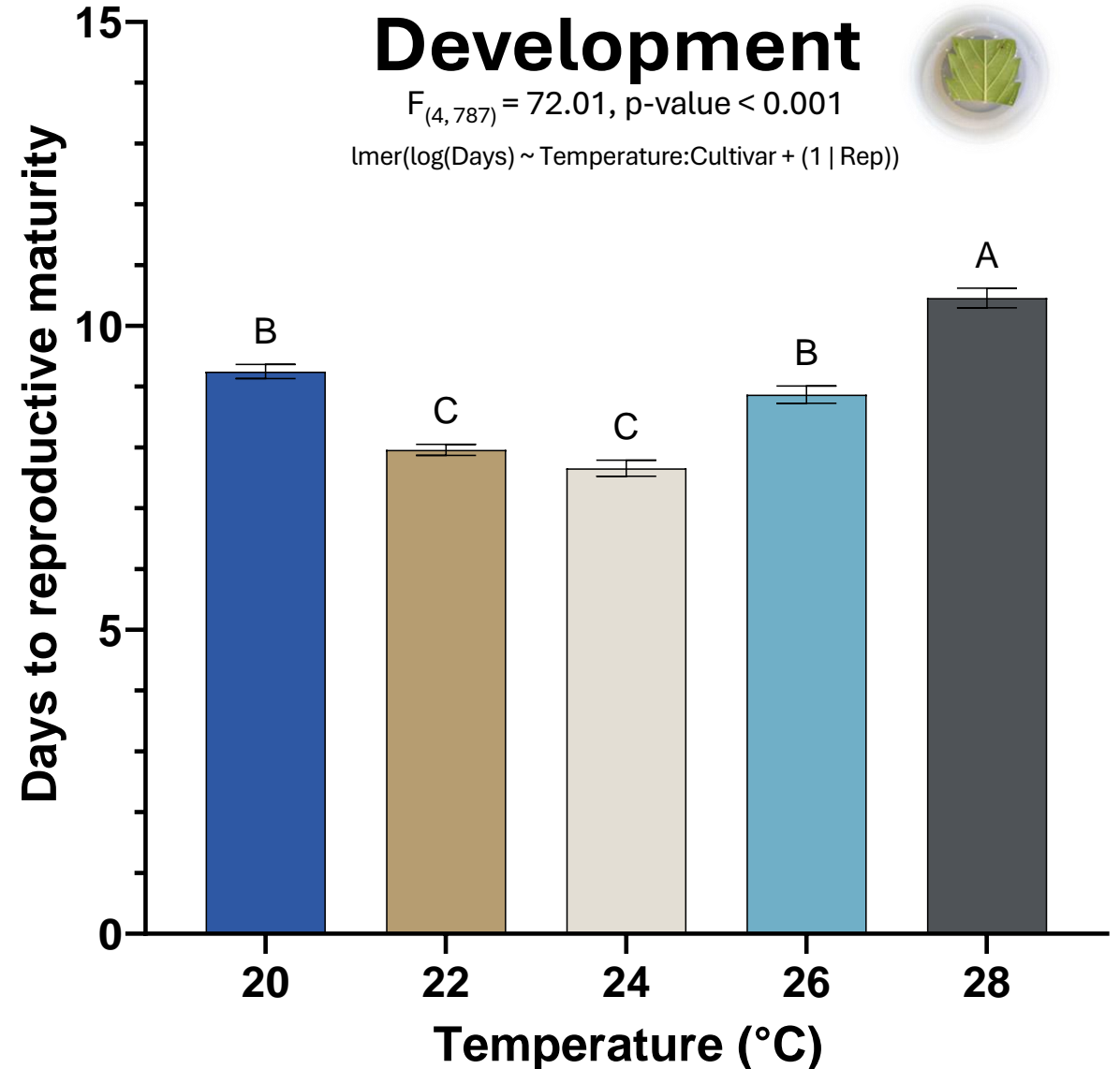


Cannabis Aphid Life History



Cannabis Aphid Life History - Development

- Four cultivars evaluated
 - Cherry Bomb, Crown Royal, French Mac, Unicorn Poop
- Development from birth until reproductive maturity
- Four replicates of 10-15 aphids per cultivar and temperature

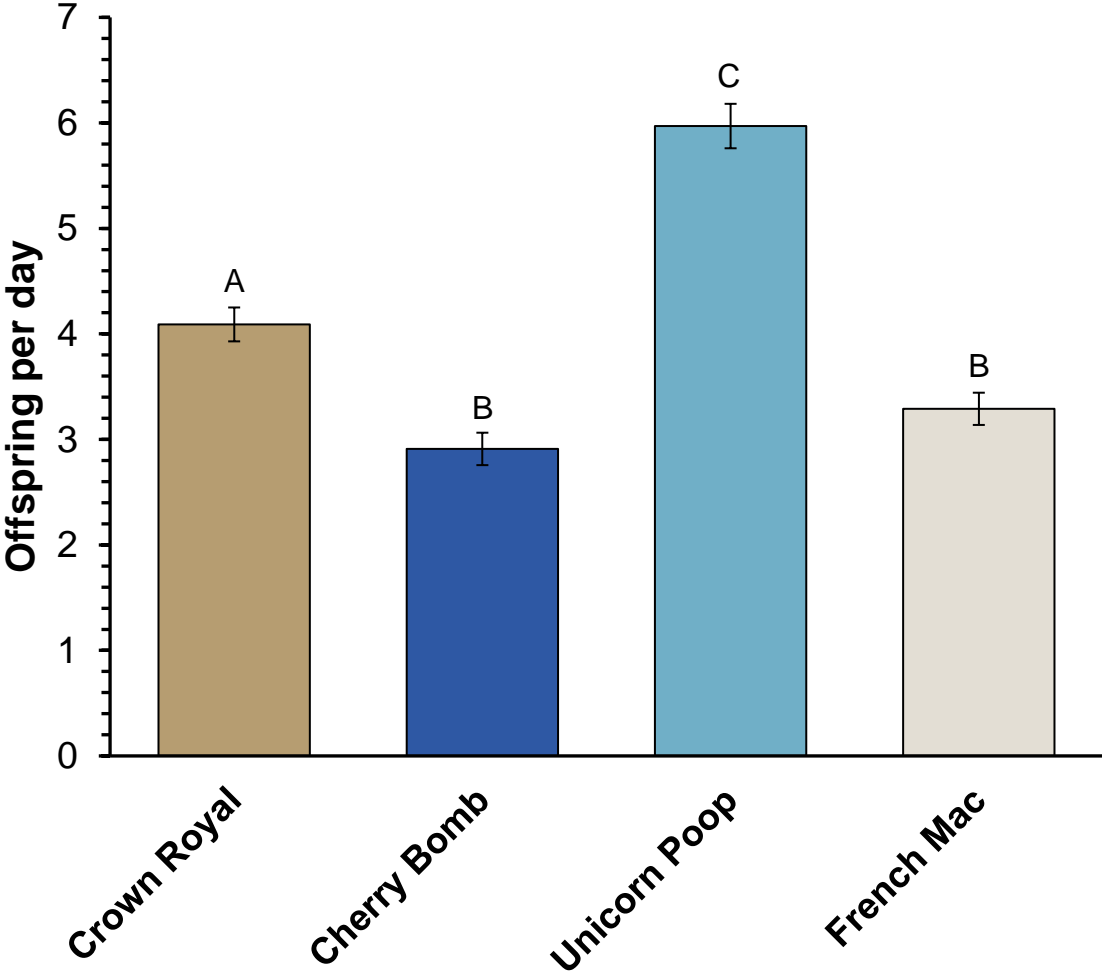


Cannabis Aphid Life History - Fecundity

Daily fecundity



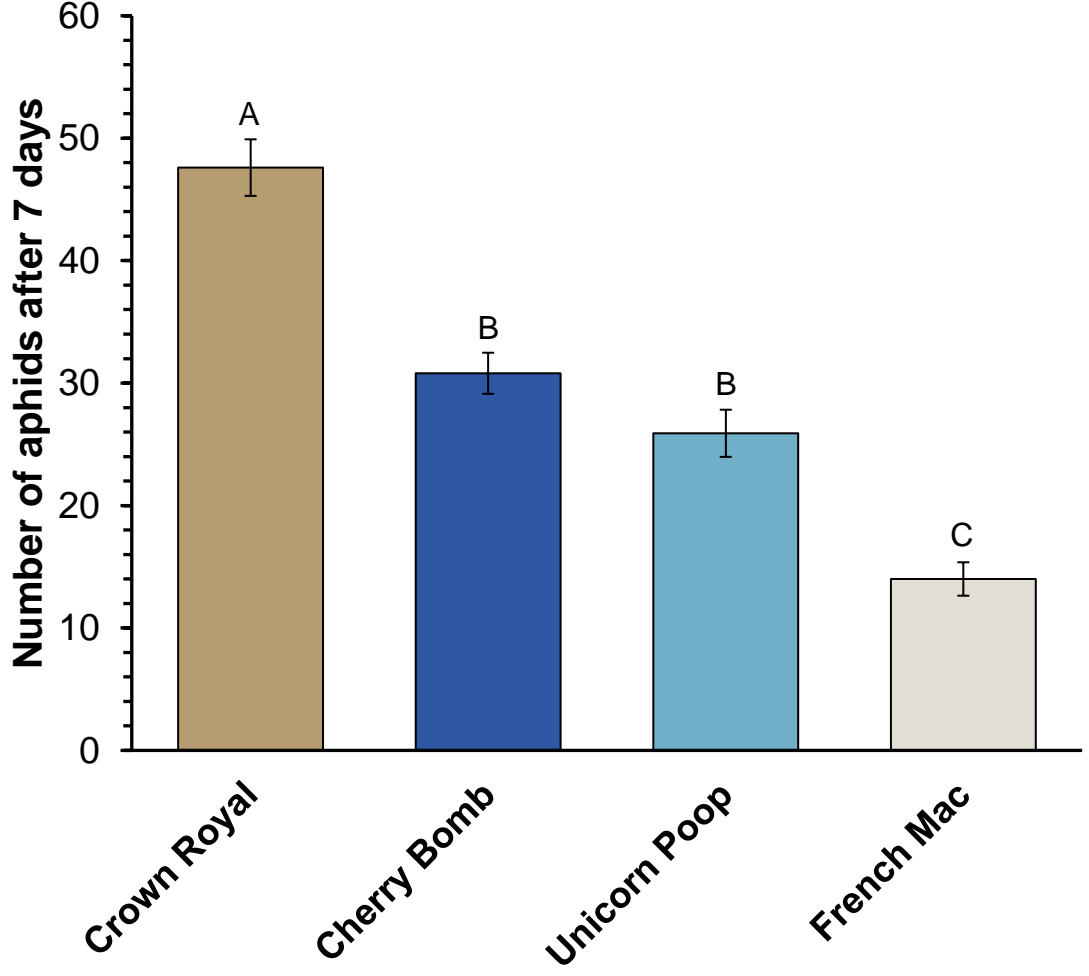
$\chi^2_{(3)} = 11.78, p\text{-value} = 0.008$
glmmTMB(Offspring ~ Cultivar + (1 | Aphid), family = nbinom2)



Aphids after 7 days



$\chi^2_{(3)} = 157.07, p\text{-value} < 0.001$
glmmTMB(Offspring ~ Cultivar + (1 | Rep), family = nbinom2)

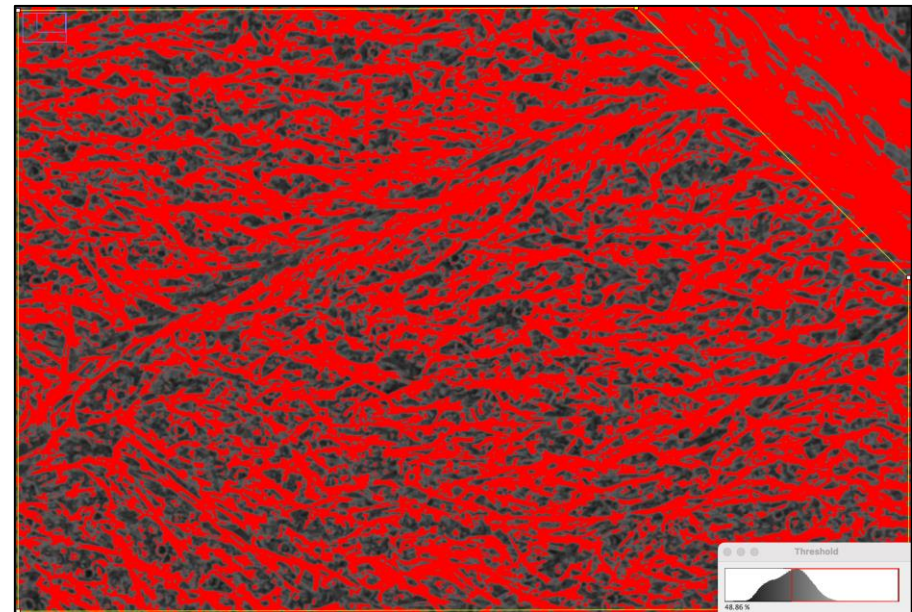


Pairwise comparisons: emmeans with Tukey adjustment

Trichome Density

Cultivar	Leaf area covered by trichomes (%)	New leaf area covered by trichomes (%)	Stem area covered by trichomes (%)
Cherry Bomb	41.64a	62.97b	48.66b
Crown Royal	39.05a	51.22a	51.35b
French Mac	53.52b	74.54c	34.46a
Unicorn Poop	42.58a	83.46c	71.05c

Model: betareg(Percent ~ Cultivar*Tissue, data = Trichome)| Pairwise comparisons: emmeans (pairwise ~ Cultivar*Tissue)

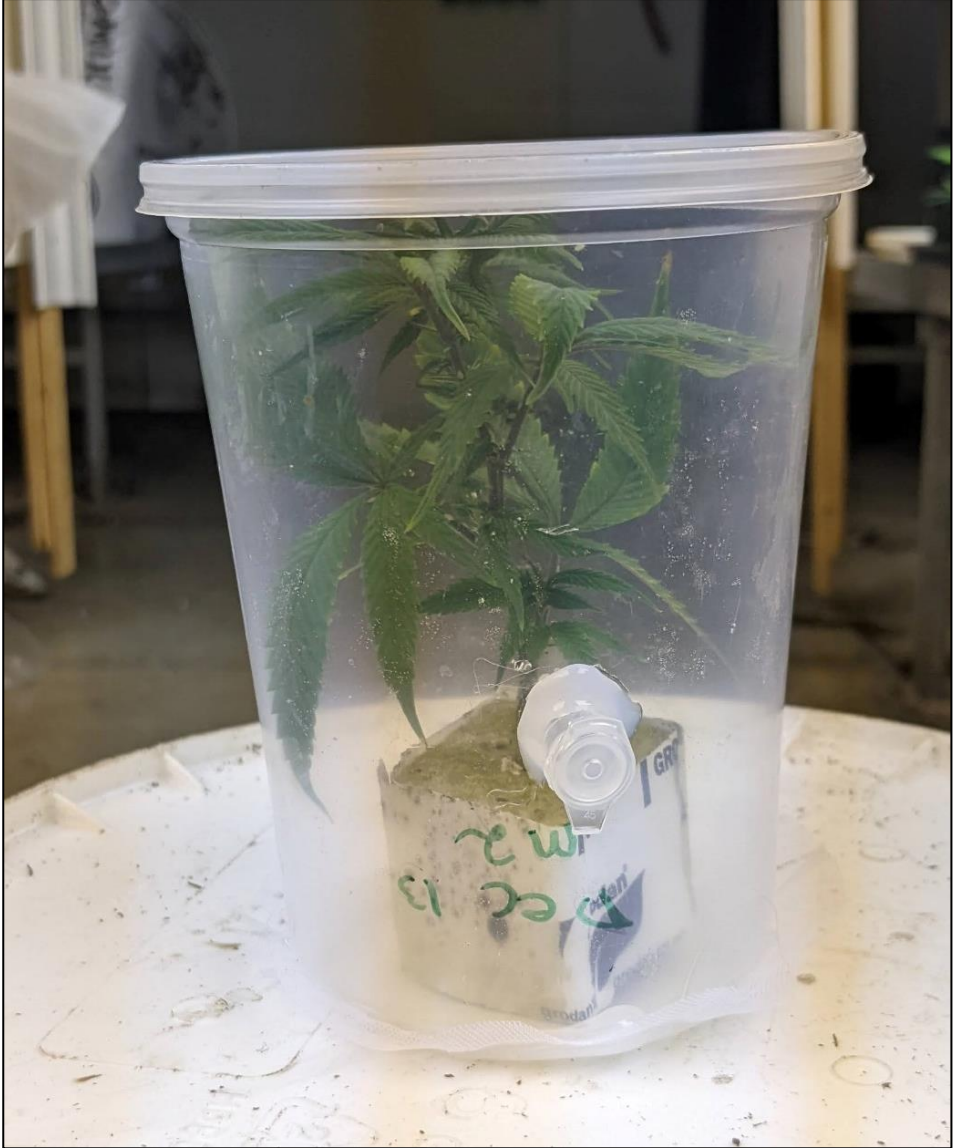


Natalie Savoia

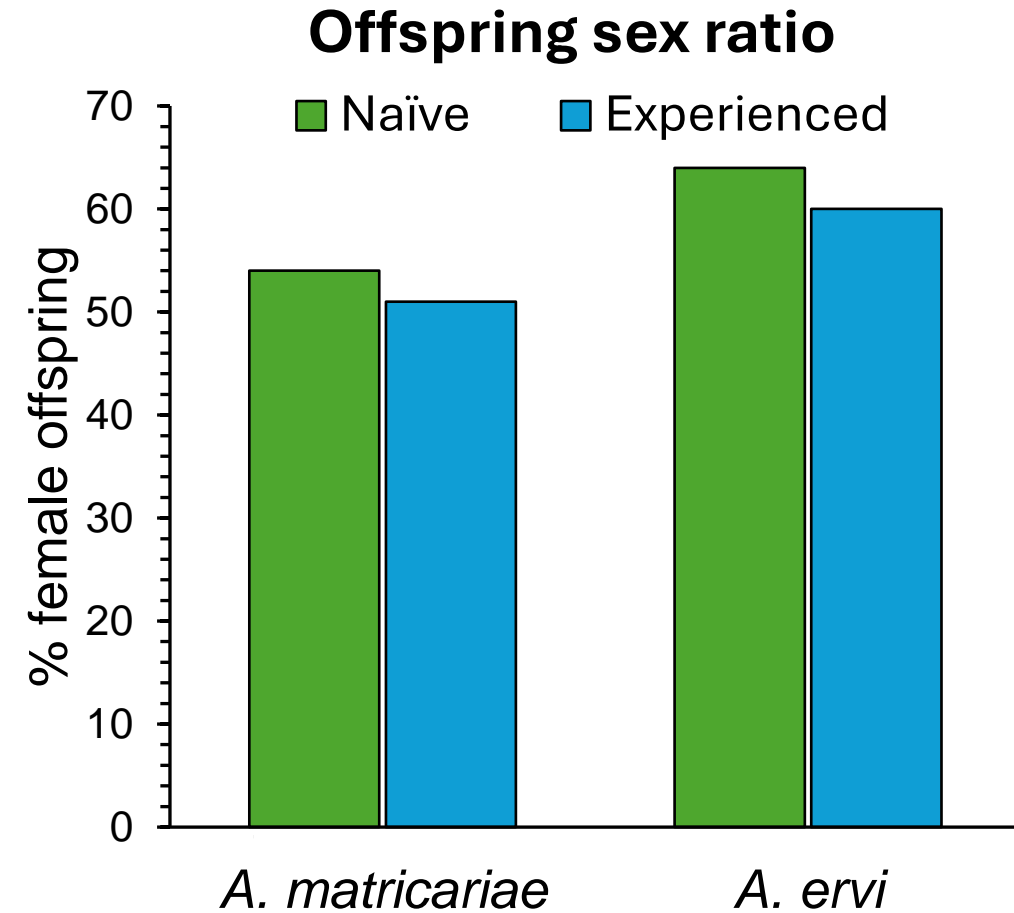
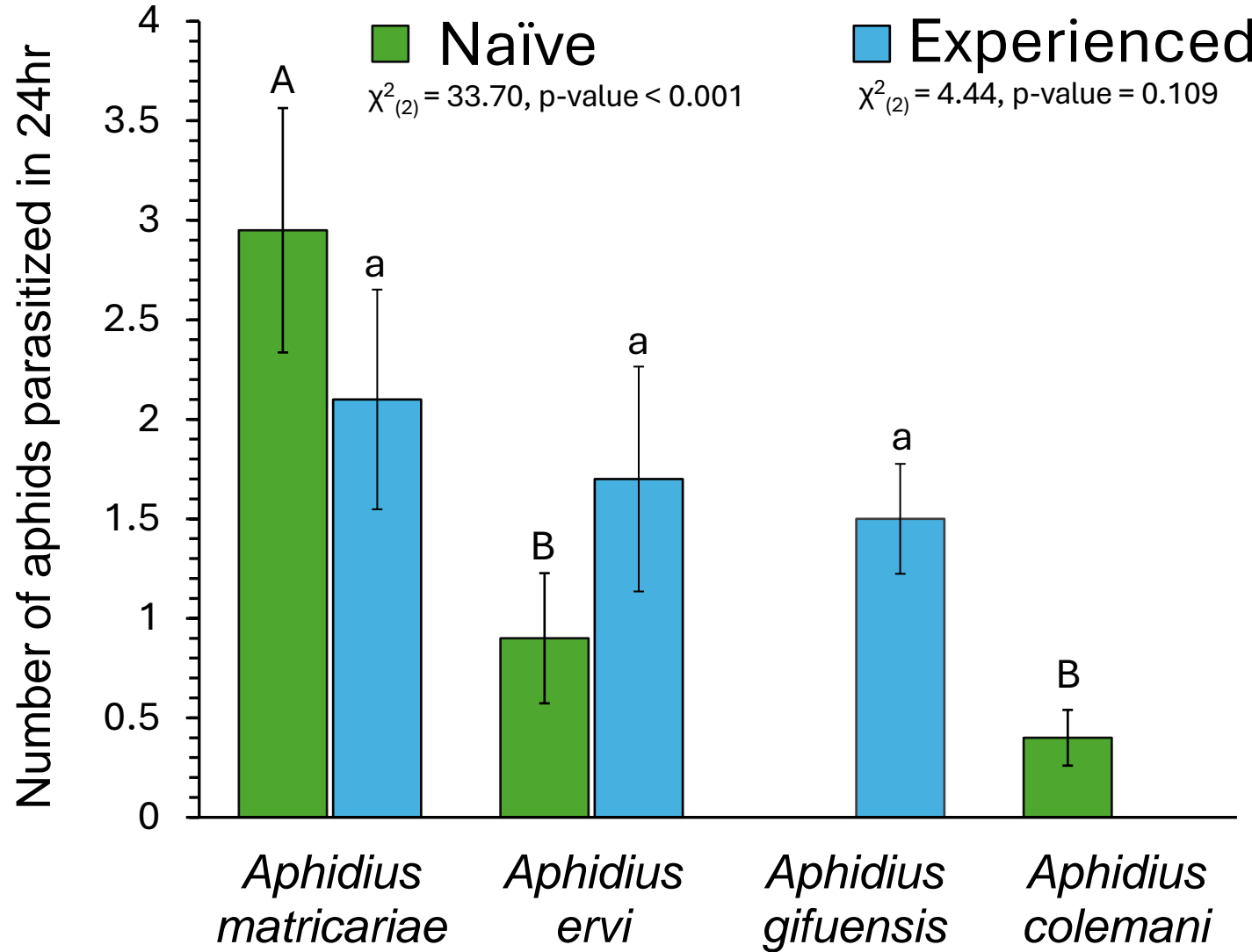


Carter Mikkelsen

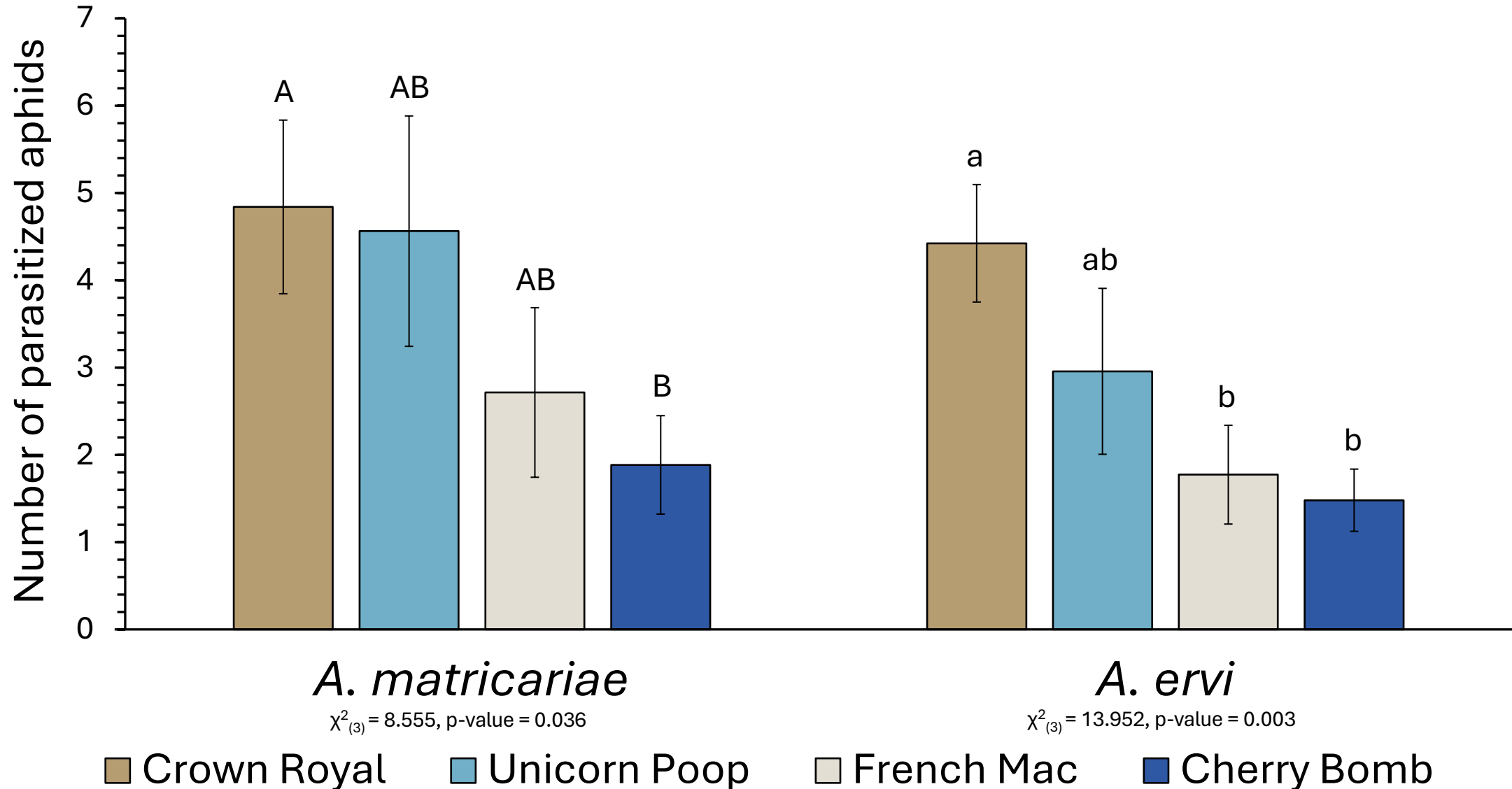
Biological Control of Cannabis Aphid



Parasitoid Performance - Experience



Parasitoid Performance - Cultivar



Summary

1. Cannabis aphid can be managed through changes to temperature & by selecting appropriate cultivars
 - Three fewer generations at 28°C
 - Dense trichomes like Unicorn Poop and French Mac
2. *Aphidius matricariae* is the most effective aphid parasitoid
3. Cultivar may have an effect on parasitoid performance

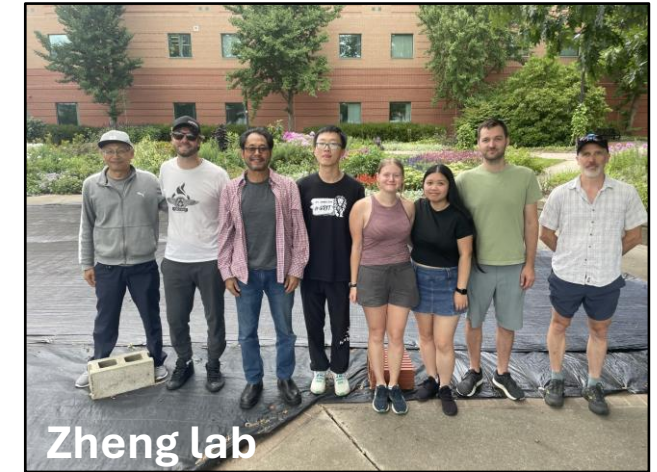


Thank you!

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