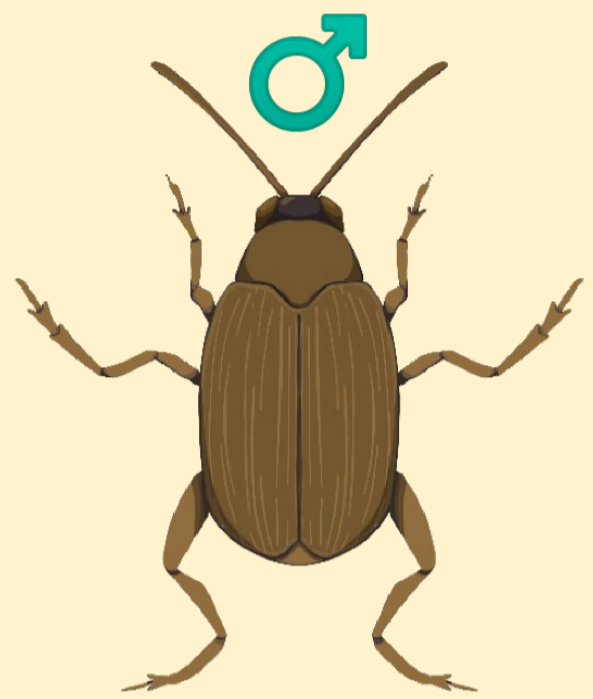
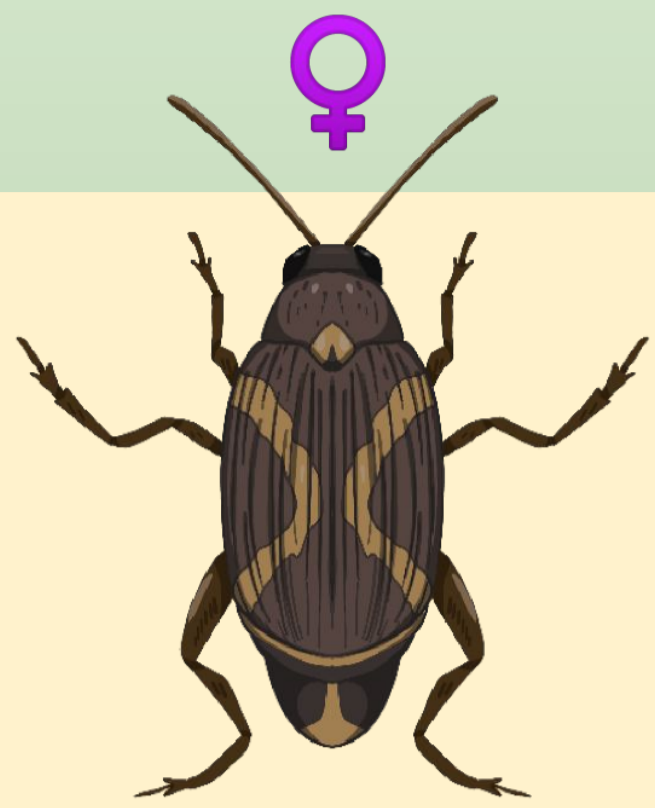


# Holy Moldy: Do bean beetles like it wet?

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## Do bean beetles have a preference in hydration for egg laying?

**Hypothesis:** We expect higher egg laying rate in the hydrated beans [1,2].

Relative humidity will influence the development time and success in bean beetles. With more extreme weather events expected in the future, species such as bean beetles, will have to adjust to these new conditions [3].

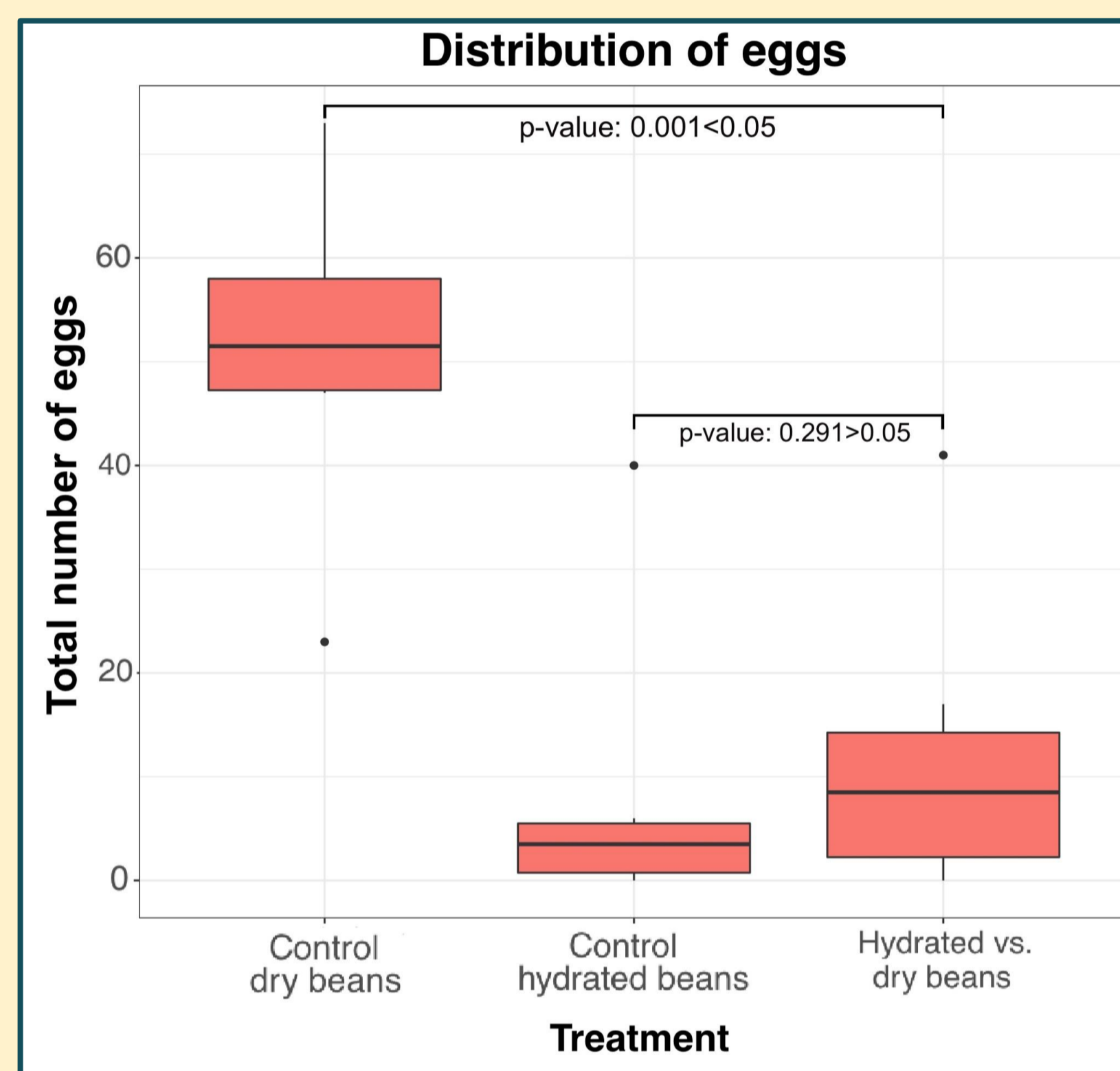
## Bean beetles, *Callosobruchus maculatus*

Bean beetles have a short lifespan which they spend on mating and laying eggs. The eggs are laid on beans where the larvae will feed and develop [4]. By looking at how many eggs the beetles lay on hydrated and non-hydrated beans in both separate dishes and different chambers in same dishes, we can see if the beetles prefer and thrive best in hydrated or non-hydrated environments.

## What did we discover?

GLM Poisson distribution model used for statistical analysis.

- ★ **Significantly higher amount of laid eggs on dry beans**
- ★ **No proof that they will prefer hydrated beans**
- ★ **No significant difference** between eggs laid in the **control hydrated vs. mixed treatment**
- ★ **Bean beetles will choose dry beans to lay their eggs on if given the choice**

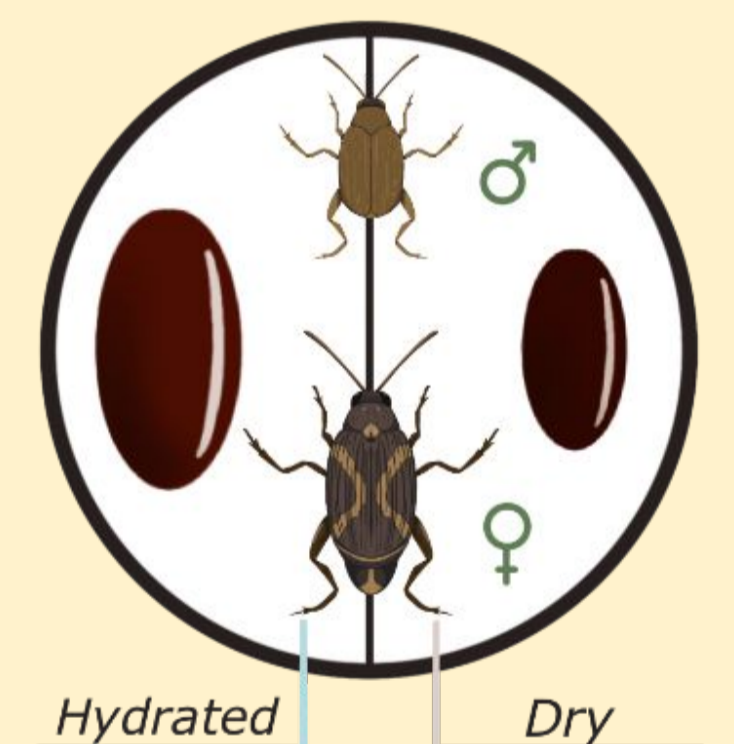
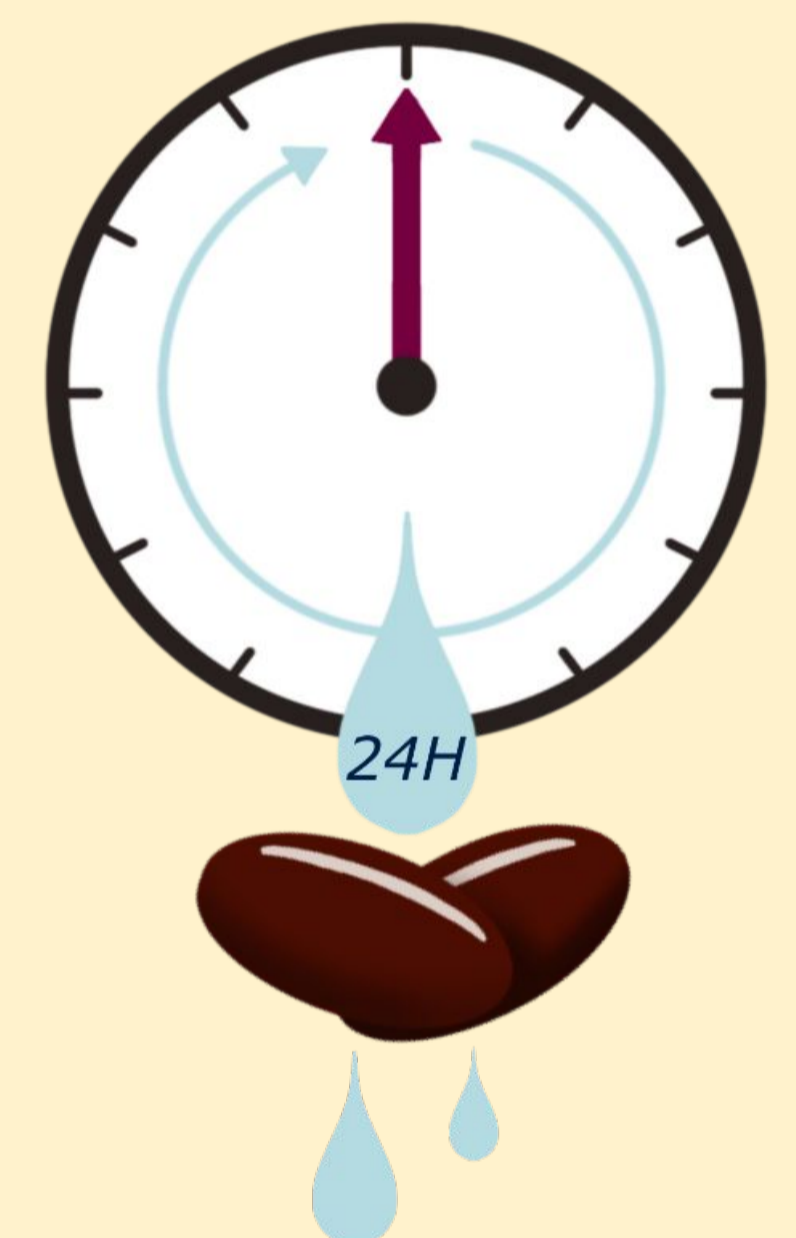


## What does it mean?

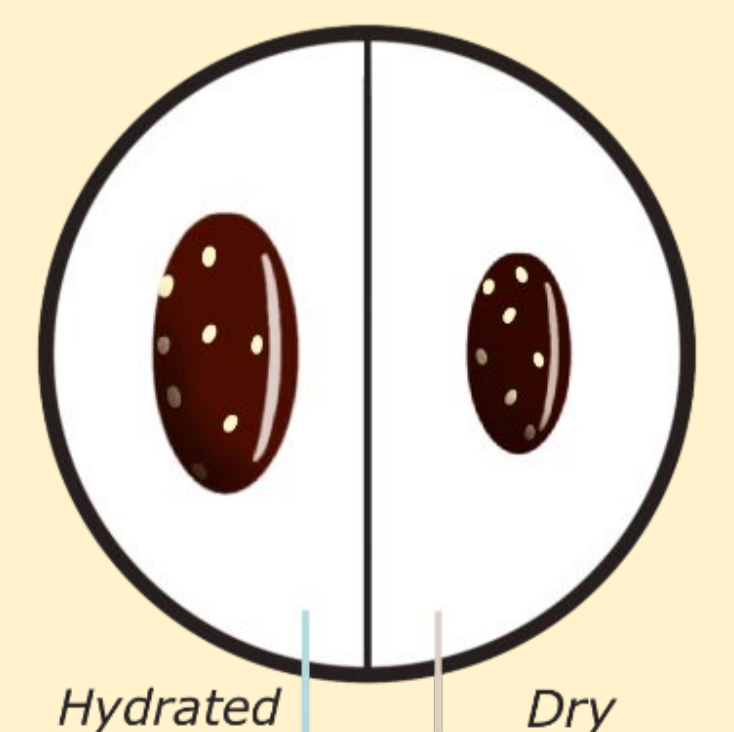
Our experiment did not go as we expected! The humidity generated by the hydrated beans created an environment conducive to the development of mold, which inhibited the effective laying and development of eggs across beans.

We were still able to observe that the beetles mainly laid eggs on the dried beans, contrary to our hypothesis. However, when comparing with relevant literature, we find that bean beetles do better in humid environments [5].

We recommend repeating the experiment with different temperatures, or in a larger box to limit condensation. Further, creating a consistent airflow that more closely mimics real conditions, would likely decrease the growth of mold.



Incubation



Count eggs



SCAN ME



### References

- [1] Sano-Fujii, I. (1984) "Effect of bean water content on the production of the active form of *Callosobruchus maculatus* (f.) (Coleoptera: Bruchidae)," *Journal of Stored Products Research*, 20(3), pp. 153-161. Available at: [https://doi.org/10.1016/0022-474x\(84\)90024-9](https://doi.org/10.1016/0022-474x(84)90024-9).
- [2] Umoetok Akpassam, S.B., Iloba, B.N. and Udo, I.A. (2016) "Response of *callosobruchus maculatus*(f.) to varying temperature and relative humidity under laboratory conditions," *Archives of Phytopathology and Plant Protection*, 50(1-2), pp. 13-23. Available at: <https://doi.org/10.1080/03235408.2016.1248034>.
- [3] Rosenzweig, C., Iglesias, A., Yang, X. B., Epstein, P. R. and Chivian, E. (2001) *Climate change and extreme weather events - Implications for food production, plant diseases, and pests*. NASA Publications. 24
- [4] Beck, C. W and Blumer, L. S. (2014) *A Handbook on Bean Beetles, Callosobruchus maculatus*. National Science Foundation: Christopher W. Beck & Lawrence S. Blumer.
- [5] Dipchansingh, D. and Khan, A. (2021) "Relative humidity affects life table parameters of *callosobruchus maculatus* (fabricius) (Coleoptera:Bruchidae)," *Archives of Phytopathology and Plant Protection*, 54(19-20), pp. 1797-1806. Available at: <https://doi.org/10.1080/03235408.2021.1941547>.