

# *Tetramorium caespitum* Ants have an Affinity Towards High Wavelength Colors

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## Research Question

Do *T. caespitum* ants prefer colors with a higher wavelength or a lower wavelength?

## Prediction

It was predicted that *T. caespitum* ants would prefer colors with a lower wavelength.

## Background

There have been multiple previous experiments conducted on closely related insects and ant species, to ants as well as other ant species.

- *C. blandus* was given an option to choose from UV light (low wavelength) and red light (, the two extremes of the color spectrum (Yilmaz et al. 2017).
- Other insect species were used as well like bees, which are closely related to ants, and humming moth hawks. Not only were the tested for color preference, but also for their memory retention span (Camlitepe et al. 2009)

## Materials and Methods

### Materials:

- 10 *T. caespitum* ants
- 30 Choice Chambers
- Colored paper (red, orange, blue, white)
- Timers
- 1 Forceps

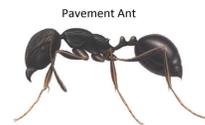


Fig 1: *T caespitum* ants



Fig 2: Choice chambers with white background

### Methods:

- The ants were initially introduced in choice chambers with white background for 5 minutes (Fig. 2).
- They were transferred into the choice chambers with blue and red background for 2 minutes (Fig 3).
- While in the red and blue choice chamber, the time spent in each color was recorded using a separate timer.
- They were put back into their original white background for 3 min.



Fig 3: Choice chambers used for red vs blue experiment

## Discussion

This particular study is a complementary study to Yilmaz et al to wavelength, but the *T. caespitum* ant was tested on its color preference rather than its ability to distinguish color.

When experimenting on distinguishing color with an ant native to the desert, it failed to discriminate color (Camlitepe, Y., Aksoy, V. 2009). The *T. caespitum* ant is exposed to different colors daily, and may be why it has a color preference

It was a successful study and in future studies, it will build an understanding as to how the *T. caespitum* ant forages for food, and if color influences their food choices.. Multiple trails will be conducted on the ant.confirm their color preference..

## Results

- *T. caespitum* ants spent more time in red (longer wavelength) in red vs blue.
- The average time spent in red was much higher than that the average time (in seconds) spent on blue. (F
- There was statistical significance in the data collected. (p=0.044).

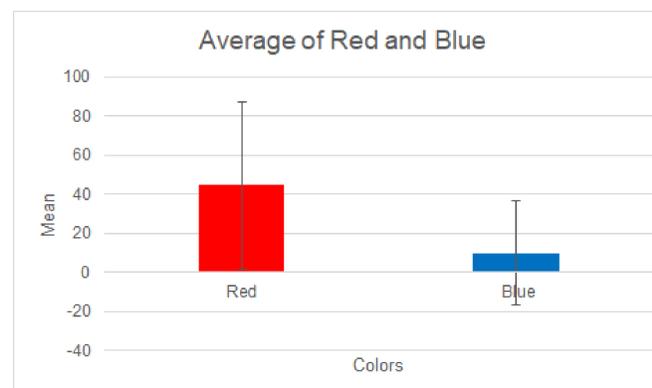


Fig.4 The color preference of the *T. caespitum* ant in blue and red.

## References & Thanks

Camlitepe, Y. & V. Aksoy (2009). First evidence of fine color discrimination ability in ants (*Hymenoptera, Formicidae*). *Journal of Experimental Biology*, 213, 72-77.

Carbaugh, J.R., Renthall, R.D., Vinson, S.B. et al. *Insect. Soc.* (2019). <https://doi.org/10.1007/s00040-019-00740-w>

Yilamz, Ayse, et al. (2017). Innate color preference, individual learning and memory retention in the ant *Camponotus blandus*. *Journal of Experimental Biology* (2017) 220, 3315-3326.

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