CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34073

Project Title

Can Ant Pheromones Communicate Food Quality?

Abstract

Objectives/Goals

To determine whether trail pheromones used by Argentine Ants can communicate the quality of a food source.

Methods/Materials

Solutions varying in sugar concentrations were presented separately and simultaneously to a colony of Argentine Ants. In some trials the pheromone trails leading to the two solutions were switched. Photos of each food source were taken every 60 seconds. The numbers of ants were then counted and plotted over time.

Results

As the sugar content of a solution increased, so did the rate at which ants accumulated. In the simultaneous trials, the high concentration solution attracted the most ants, even if the lower concentration solution was discovered first. If the surfaces with the pheromone trails leading toward the low and high food sources were switched, the number of ants moving toward each food source also switched.

Conclusions/Discussion

If ants were already foraging along an existing pheromone trail, the colony would switch its focus to a new, higher quality food source. This shows that a newly laid pheromone trail can communicate not only the presence of food, but also the food's quality. If two pheromone trails were switched, the number of ants moving toward each food source switched as well, helping to eliminate the possibility of the food's quality being communicated by means other than pheromones.

Summary Statement

This project investigates whether trail pheromones used by Argentine Ants can communicate not only the presence of a food source, but also its quality.

Help Received

Father helped with statistics.