

Pheidole sp. and Tapinoma sp. (Hymenoptera:Formicidae)

Changing Food Preferences

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ABSTRACT

Pheidole sp. and Tapinoma sp. are the ant species that are naturally found in the Mediterranean region and are dominant in their environment. In order to provide a natural environment for the colonies formed in the test tube, 2 separate vivariums were created in the laboratory and a feeding area was placed inside. Humidity and heat balance was kept constant in both colonies. In the first month, the colonies were fed with a previously accustomed mealworm and 25% glucose-water solution until they got used to the new area and settled down. In the following weeks, *Helicoverpa armigera* (green worm) was given instead of the mealworm, and the first 15 minutes were observed. Colony members that came to the food area and fed each week were counted, and analysis was made according to the Mann-Whitney U test, one of the non-parametric tests. Considering the analysis methods, food was accepted by both groups. Since $p < 0.05$, there is a significant difference between the groups in terms of nutrition. The mean value shows that Pheidole sp. colony was found to be in favor. Pheidole sp. and Tapinoma sp. can be used as a predator in agricultural pests, and the natural populations of the species can be preserved in the ecosystem's own balance by avoiding the use of chemical pesticides.

INTRODUCTION

- Usage of pesticides in agriculture has been increasing, however pests have been developing resistance to pesticides.
- Pesticides have been suppressing natural enemies of pests, which results in more damage to corps by pests.
- To prevent health issues that derive from overusage of pesticides and pest damage to the corps by resistant insects, biological control methods can be used.
- Pheidole and Tapinoma are genuses that both can be found in Eastern Mediterranean citrus orchards(Demirbaş, Satar, 2011)*
- Pheidole sp. and Tapinoma sp. are the ant species that are naturally found in the Mediterranean region and are dominant in their environment.
- Pheidole sp. is also known to be a predator of *H. Armigera* eggs and larvae. (Denberg, Cock, Oduor, 2010)**



Figure 1: Pheidole aberrans



Figure 2: Tapinoma atriceps

METHODOLOGY

- 2 identical vivariums that have 5 layers: (from bottom to top) rocks, a sheet of felt, coal, dirt and moss were made to imitate habitats of ant colonies.



Figure 3: Vivariums

- Ant colonies that have been raised in test tubes were introduced to the new environment. They were given mealworms and %25 glucose-water solution for a month, until they get used to the new environment.



Figure 4: Pheidole sp. colony feeding on mealworm

METHODOLOGY

- In the following weeks, colonies were given *Helicoverpa armigera* larva instead of mealworm and were observed for 15 minutes each week.



Figure 5-6: Pheidole colony feeding on *H. Armigera* larva

- Mann-Whitney U Test is used for statistical analysis.

RESULTS

Group	N	RS(Rank Sum)	RA(Rank Average)	U	Z	p
Pheidole	6	9,17	55,00	2,000	-2,579	,010
Tapinoma	6	3,83	123,00			

Table 1: Preferring *H. armigera* as a food

According to the table, preference for *H. armigera* as a food had a significant difference. Tapinoma colony was found to be in favor.

Grup	N	RS(Rank Sum)	RA(Rank Average)	U	Z	p
Pheidole	4	2,50	10,00	,000	-2,309	,021
Tapinoma	4	6,50	6,50			

Table 2: Preferring mealworm as a food

According to the table, preference for mealworm as a food had a significant difference.Pheidole colony was found to be in favor.

Grup	N	RS(Rank Sum)	RA(Rank Average)	U	Z	p
Pheidole	12	13,71	164,50	9,500	-2,983	,003
Tapinoma	8	5,69	45,50			

Table 3: Preferring all larvae as a food

According to the table preference for all larvae as a food had a significant difference. Pheidole colony was found to be in favor.

CONCLUSION

Helicoverpa armigera does great damage to agricultural production as a pest. Farmers usually use pesticides to control their population and reduce the damage. However usage of pesticides results in pollution and various health issues. In contrast to that using native predators causes less pollution and is a more eco friendly solution.

Pheidole sp. and *Tapinoma sp.*are both native to Eastern Mediterranean area. It was observed that they both choose *Helicoverpa armigera* larva as a food.

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