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Study on foraging behavioral pattern in *Solenopsis geminata*

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Abstract: Ants are one of the primitive species following wasp like in habit forming small and large colonies. *Solenopsis* is among the several ant species which comes under the household ants or harvester ants. In the present paper attempt has been made to study the foraging pattern or behavior among the ant's species *S.geminata*. Since foraging behavior has been studied in most of the species but here research has been done to study about the fire ant *S.geminata*. Although, this study was a complicated process. Foraging in ants does not involves only study about the behavioral pattern but also the different activities opted by the ants to avail food.

Key words: *Solenopsis geminata*, foraging, Madhepura, colonies

INTRODUCTION

The order hymenoptera consist of more than 100000 species of insects and some of the species are still to be discovered. They may be free living, phytophagous, predatory, entomophagous parasitic or social insects. Certain wasps, bees and ants are polymorphic and social insects. They have very diversified behavior, habits, nest building, caste system, chemical communication system etc. In almost all types of habitats insects are found due to their behavioural adaptability or plasticity[1]. Although such types of behaviour pattern are usually associated with foraging genes[2].

Study on Ants (Family: Formicidae) are an exceptionally diverse and widespread group of arthropods, containing over 13,000 extant species estimated to comprise up to 20% of animal biomass[3,4]. Foraging process is quite complicated, by obligate & eusocial found among the ant colonies since foraging occurs for the benefit of entire colony rather than the individual[5]. For the survival ants need to leave their nest & forage for food. Among the ant colony survival of the fittest usually depends on optimal path between their nest & the food source[6,7]. Thus foraging decision may include where to search, how long to search at the site given, whether or not to return to a site where search was previously conducted. Nest and food source indeed play important roles in ants' foraging behavior.

The tropical fire ant species *Solenopsis geminata* is among one of these species having the family hymenoptera.

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MATERIAL AND METHODS

Selection of the sites:-

Different colonies of the *S.geminata* were selected at one of the government school in Madhepura district. The sites selected were present at only one place so that study can become easy. All the colonies were then marked with colony A, Colony B & Colony C. Each of the colonies contained 50 ants each. Each of the ant group was then separated with silver wire net with pin holes so that the

ants could not escape outside from it. And each of these ants nest were located merely 50-70 cm in each.

Colony A: - Colony A was fed with the grinded wheat flour (granule type) and was kept in plastic petridish. A hole was made at one side so that the study can be more clear following the method mentioned by Hooper & Rust(1997)[8].

Colony B: - Colony B was fed with anchovy which was soaked in water to soften and then dried in oven under 50° C to make sure that it can be turned into small granules (<2mm) & can be easy for the workers ant to carry it to their nest before carrying out the research.

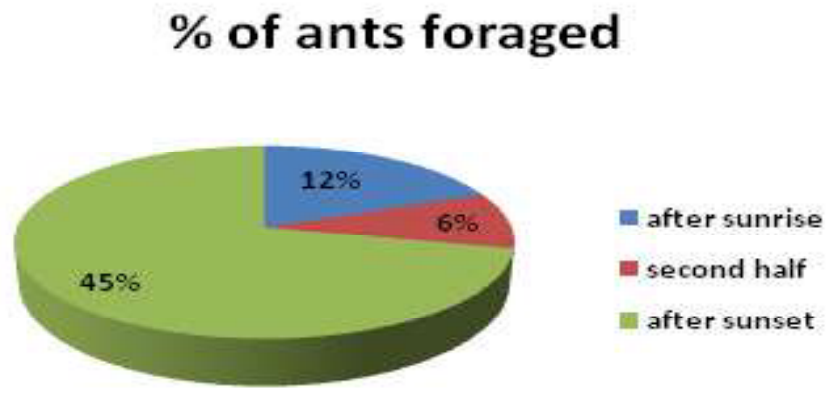
Colony C: - Colony C of the ant was fed with sugar in plastic petridish & further study was made.

Field trip:-During the study of foraging pattern field trip of the selected area were made three times in a day. Once in the morning between 8-10 am, second trip was between 12-2 pm in afternoon and the last trip was made during evening hour between 6-8 pm. The visit of the selected sites was made at least for 2 weeks and the result obtained was as follows:-

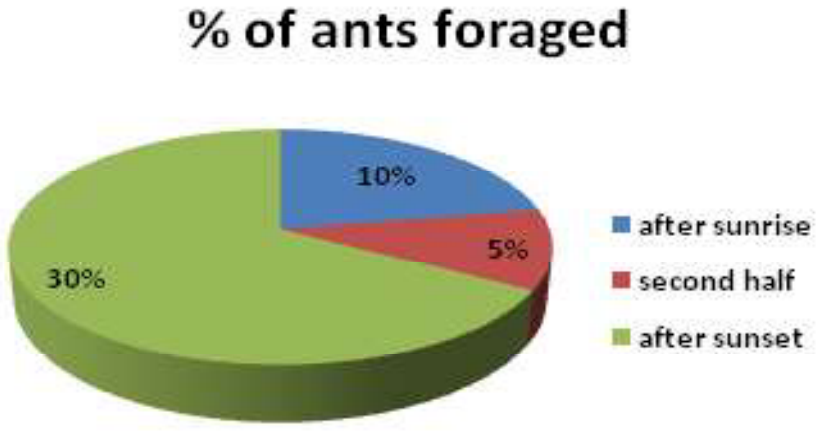
RESULT & DISCUSSION

The investigation on *S.geminata* shows that the all the three colonies were marked for the foraging study did not showed any differences, the only difference was the amount of removal of bait by the workers ant. The foraging behavior was higher after the sunrise since it made easy by the workers ants to search food. While it slowed down after sunset.

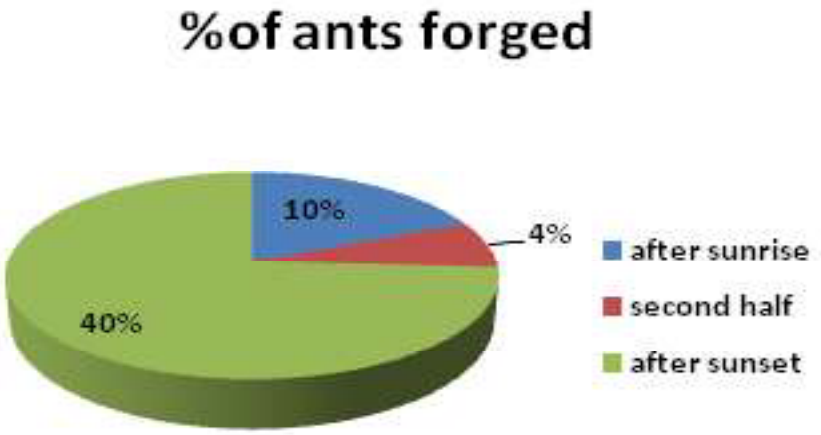
In colony A it was seen that in 50 of the ants 12% of the ants started foraging and return back to their nest carrying different bait of food size during the morning hour. However during the second half when the study was carried out it was found that only 6% of the ants foraged. And during the evening the foraging frequency was at the peak i.e 45%.



In colony B it was found that 10% of the ant species started foraging and return back to their nest very safely whereas during second half only 5% of the ants started to forage. In the evening time 30% of the ants were seen searching for food but they also returned back to their nest very safely which was the highest value.



And in colony C 19 % of the ants were seen searching for food in which population of ants searching for food was not very high. After sunset, 40% of the ant started foraging which was the peak value. While during second half only 4% of the ant could be seen searching for food having the least value.



However it was found that foraging was mostly affected by temperature, humidity, and other environmental factors are the base for foraging behavior in ants. Mostly the ants avoided foraging during day time due to the high environment temperature[9].

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REFERENCE

1. **D.B. Tembhare. 2016.** *Modern Entomology*. 305-322.
2. **Imms.** *General Textbook book of Entomology*: **10 (II):** 309-450.
3. **Bolton B. 2019.** *An Online Catalog of the Ants of the World*.
4. **Schultz T.R. 2000.** *In search of ant ancestors*.- Proceedings of the National Academy of Sciences. **97(26):** 14028 –14029.
5. **Traniello J.F. 1989.** *Foraging strategies of ants*.- Annual Review of Entomology **34(1):**191 –210.
6. **Sudd JH. 1967.** *An Introduction to the Behavior of Ants*. New York: Univ of Hull St Martin's Press.
7. **Herbers JM. 1983.** *Social organization in Lepto thorax ants: Within and between-species patterns. Psyche* (Stuttg). **90(4):**361–386.
8. **Hooper, L.M. & Rust, M.K. 1997.** Food preferences and patterns of foraging activity of the Southern fire ant (Hymenoptera:Formicidae). *Annals Entomological Society of America* **90:** 246-256.
9. **Stradling, D.J. 1978.** *Food and feeding habits of ants.* In: Brian M.V,ed. *Production ecology of ants and termites.* Cambridge University Press. p 81-106

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