

Prey-taking among some Indiana Solitary Wasps
(Hymenoptera: Sphecidae)

GERTRUDE L. WARD

Joseph Moore Museum

Earlham College, Richmond, Indiana 47374

Abstract

Several instances of prey-taking from *Sceliphron caementarium* (Drury) and *Chalybion californicum* (Saussure) nests by females of the same species are reported from Wayne County, Indiana. Taking of stored prey from *S. caementarium* by an ant, *Crematogaster l. lineolata* (Say), is also noted. Prey items in all instances were spiders. These were removed whole from the mud cells by the wasps but were cut into fragments by the ants.

Introduction

Prey-taking is the acquisition of food which one insect has already selected as food for itself or its larva, by another insect. This behavior can occur either when the adult insect is carrying food back to a nest cell or after the food has been stored. Some insects which usually gather food for their larvae from the natural habitat of the prey occasionally resort to taking prey previously gathered by a member of the same species. This may be food which is characteristic for the group, such as certain spiders used by mud-dauber wasps of the Sphecidae. In addition, food may be taken by ants or scavenger wasps. Therefore prey-taking can be either intraspecific or interspecific. Examples of both have been observed in Wayne County, Indiana.

Review of Literature

Morley (5), North Carolina, reported that she saw *Sceliphron caementarium* (Drury) taking spiders from another nest being provisioned by a female of the same species. In 1930, Bruch (1), Argentina, reported *Sceliphron figulus* (Dahlbom) taking spiders from females of that species. Rau (6), Missouri, described the opening of a nest of *S. caementarium* by a female *Chalybion californicum* (Saussure) and the removing of seven spiders. Instead of taking the spiders to her nest, she dropped them to the ground. Evans (2) ranked five species of *Bembix* in order of their habit of stealing prey: *B. cinerea* Handlirsch, very common; *B. nubilipennis* Cresson and *B. texana* Cresson, common; *B. spinolae* Lepeletier, common in dense colonies, and *B. pruinosa* Fox, rare. He also found that *Microbembix monodonta* (Say) frequently took dead arthropods from workers of the ant, *Formica fusca* L., and that *Bembix texana* females tried to take flies from a larger wasp, *Stictia carolina* (Fabricius) (3).

Wheeler (7) said that many small ants fed on the extra food in a nest of larger ants or took food from workers as they carried it back to their nest. He used the term "cleptobiosis" for this behavior. Evans (2) stated that there may be "some correlation between proximity of nests and frequency of robbing." Evans and Eberhard (4) referred

to insects which used the stored food of other insects for their offspring as cleptoparasites.

Results of Observations

Five observations of ants taking spider prey collected by the yellow-legged mud-dauber wasp, *Sceliphron caementarium*, have been recorded for Wayne County. These were seen in the upper level of a tool shed on a farm near Centerville. The ants, *Crematogaster l. lineolata* (Say), were identified by Leland Chandler, Entomology Department, Purdue University. During the first observation, the female wasp had completed one mud cell, stocked it with spiders, and sealed the end. A second cell was being filled when I noticed a procession of ants at the cell and on the rafter to which it was attached. One small crab spider was being carried out of the nest and another spider had been cut to pieces by the ants. They were carrying off bits of legs and other fragments. This occurred about 4:30 PM. At 8 PM the wasp placed a thin mud plug across the end of the empty cell.

The following morning the wasp had opened the cell by 8:45 AM and had begun to bring more spiders. At 11:25 AM a procession of ants arrived and they resumed cutting and carrying off parts of spiders. This disturbance caused the wasp to abandon her nest. She built a new nest several feet away and successfully filled five cells. Ants were never seen opening cells that had been sealed.

Two wasps showed aggressive behavior toward the ants, but apparently made no attempt to sting. Instead, the wasps picked up ants in their mandibles and threw them to the floor of the tool shed. Upon examination, these ants showed signs of being crushed by the wasps' mandibles. In 5 min, five ants were thrown down by one *S. caementarium*, but this was ineffective in halting the procession. These attacks were not successful, because there were many ants that took the places of the injured ones. In two other instances, the wasps made no attempt to defend their nests. In all instances, the wasps abandoned their nests, usually building elsewhere in the shed.

One example of spiders taken from the blue wasp, *Chalybion californicum*, by another female, *C. californicum*, was recorded July 21, 1967. The wasp was filling a cell in a deserted nest of *Sceliphron caementarium*. She had been bringing in spiders from 9:20 AM to 12:25 PM, when a smaller *C. californicum* arrived at the cell while she was away. The second wasp took a spider and flew away, then returned to the cell and took another spider. When she came back the third time, the nesting wasp was present on the cell. They fought and fell to the floor of the shed while clasping each other. The smaller wasp flew out the doorway. The nesting wasp returned to her nest and began closing the cell with mud scraped off the same nest about 2 inches away from the cell.

No examples of *Chalybion californicum* taking prey from nests of *Sceliphron caementarium*, such as Rau (6) reported, have been observed.

Five instances of spiders taken from *Sceliphron caementarium* by wasps of the same species have been observed. When approaching the nest these wasps often land 10 to 14 inches from it, then walk the rest of the way. The first instance was an attack on *S. caementarium* as she walked along a rafter carrying a large spider to her nest. In the second instance, a cell was emptied of spiders by a female wasp between 11:55 AM and 1:33 PM. At least three spiders had been in the cell, but the total was not determined. In the third and fourth instances, on two different occasions, two wasps defended their nests successfully against females of the same species by flying rapidly at the intruders, sometimes falling to the ground grasping each other. In the fifth situation, there was taking and re-taking. Three wasps, all *S. caementarium*, were involved. One, Wasp 33, took two spiders from Cell 55 before its maker, Wasp 55, closed her cell. There was conflict twice between Wasps 33 and 55. Then, Wasp 47 took one of the spiders from the cell of Wasp 33. This spider had been taken earlier from Wasp 55. Then Cell 47 was sealed. Wasp 33 inspected Cells 52 and 32 before returning to Cell 55. This hunt was unsuccessful, because Cell 52 was empty, Cell 32 was being closed and Cell 55 was already closed. It appears that cells that have been attacked may be sealed before they are filled, but more observations are needed to prove or disprove this. The closure may be similar to the thin seal that is made over an incompletely filled cell in the late afternoon, and removed the following day when filling resumes.

Conclusion

Taking of prey from one wasp by another of the same species is not uncommon among the mud-dauber wasps, but the frequency of this behavior may depend upon proximity of nests. Ants commonly take food from mud cells and may cause wasps to desert some locations and build elsewhere. Ants entered nests before sealing but were not seen opening cells that had been sealed. No instance of spider-taking by *Chalybion californicum* from cells of *Sceliphron caementarium* was found.

Acknowledgments

The assistance of Lee J. Reynolds under NSF-URP grant to Earlham College is gratefully acknowledged.

Literature Cited

1. BRUCH, C. 1930. Nidificacion de *Sceliphron figulus* (Dahlb.) D.T. y observaciones biologicas sobre esta especie. Ann. Soc. Cient. Argentina 110:367-386.
2. EVANS, H. E. 1957. Studies on the comparative ethology of digger wasps of the genus *Bembix*. Cornell Univ. Press, Ithaca, N.Y. 248 p.
3. ————. 1966. The comparative ethology and evolution of the sand wasps. Harvard Univ. Press, Cambridge, Mass. 526 p.
4. ————, and M. J. W. EBERHARD. 1970. The wasps. Univ. Mich. Press, Ann Arbor. 265 p.
5. MORLEY, M. W. 1900. Wasps and their ways. Dodd, Mead and Co., New York, N.Y. 316 p.
6. RAU, P. 1928. The nesting habits of the wasp, *Chalybion cocruleum*. Ann. Entomol. Soc. Amer. 21:25-35.
7. WHEELER, W. M. 1910. Ants. Columbia Univ. Press, New York, N.Y. 663 p.