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**BEHAVIOR AT A NESTING SITE AND PREY OF *CRABRO CRIBRELLIFER* (HYMENOPTERA: SPHECIDAE)**

Edward M. Barrows<sup>1</sup>, Patricia L. Lebau<sup>2</sup>, and Cathlyn E. Eckstein<sup>2</sup>

ABSTRACT

In Michigan, *Crabro cribrellifer* tends to show nest clumping within a nest aggregation. Its nesting behavior is similar to that of other *Crabro*, and it preys on *Neoitamus flavofemoratus* (Diptera: Asilidae) on warm days in July. Miltogrammine flies *Metopia campestris* are active at the nesting site.

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*Crabro cribrellifer* (Packard) (Hymenoptera: Sphecidae) is found from New Hampshire to Florida and in Ontario, Michigan, and Indiana. It preys on the asilid *Ommatius tibialis* Say (Krombein, 1951), and probably *Tolmerus novaescotiae* (Marquart) according to Kurczewski and Acciavatti (1968) who review nesting behaviors of Nearctic species of *Crabro*. There have been no published investigations regarding the biology of *C. cribrellifer*; therefore, we report aspects of its nesting and provisioning with a previously unrecorded prey.

Wasps were studied in July, 1977, on the grounds of the University of Michigan Biological Station, Cheboygan County, Michigan. Twenty-six wasps were marked for individual recognition with fast-drying enamel paints of different colors. Nests were in a 40-m-long part of a lightly-used, level, dirt road through a second growth woods primarily composed of *Acer rubrum* L., *Populus tremuloides* Michx., *Pinus strobus* L., *Quercus rubra* L., and *Betula papyrifera* Marsh. Means and medians are given in parentheses after ranges of data.

A 5.9 × 1 m section of the road contained most of the nests. Forty-eight nest entrances in this 5.9 m<sup>2</sup> area approached having a subclumped distribution ( $R = 0.86$ ,  $c = 1.94$ ,  $p = 0.052$  that nest distribution differs from a subclumped one by chance alone, nearest neighbor analysis, Clark and Evans, 1954). This may result from nest initiating females being attracted to nests of other females, patchy distribution of soil which is preferred for nesting, or both. Tumuli surrounded many of the entrances when the site was discovered and wasps dug new nests during July. Eight excavated nests had main burrows that were from 6 to 44 cm long and had from 0 to 19 subhorizontal cells (6.5, 4). Nine cells contained from 1 to 5 asilid flies *Neoitamus flavofemoratus* (Hine) (2.5, 3); some appeared paralyzed and others were decomposing. One cell contained one wasp larva and two cells each contained one wasp pupa. Three cells each contained one ellipsoid wasp cocoon that was about 5 mm in diameter by 13 mm long.

Nest examination indicates that *Crabro cribrellifer* has this nesting behavior: nest-(prey)<sup>n</sup>-egg [cell closed and new cell prepared-(prey)<sup>n</sup>-egg]<sup>n</sup> closure (Evans and Eberhard, 1970). This nesting pattern may enable wasps, in times of prey scarcity, to fill a cell over a period of days before oviposition, or conversely, to fill cells rapidly when prey is abundant and yet space out egg laying over several days.

At about 0800 hrs, six wasps dug out of nests through loose soil that plugged entrances. If oak leaves fell over entrances, wasps chewed through leaves as they were

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leaving nests. Wasps left nests open while they were away from them. Wasps without asilid prey spend from 0 to 195 sec (48.4, 20, N = 14 observations) orienting before they entered nests. Orienting involved flying from side to side over entrances, making looping flights over the nesting site, or both. After leaving nests, wasps spent from 0 to 420 sec (31.7, 5, N = 23) orienting before they flew from the nesting site. One wasp closed her nest from inside with loose soil at 1530 hrs immediately after she brought in an asilid. In 42 observations of wasps returning with prey, ambient temperatures were from 24° to 34° C. The degree of temporal synchronization of *C. cribrellifer* hunting and asilid prey activity has yet to be studied.

Six marked wasps each entered two different nests. One wasp provisioned two nests on the same day. One nest was provisioned by one wasp on a particular day and by another wasp on the next day. Possible communal nesting in *C. cribrellifer* should be studied; such nesting is known in other Crabronini (Evans and Eberhard, 1970).

Wasps carried asilids with their middle legs and held asilid venters next to their venters as do other *Crabro* (Evans, 1960). After wasps brought flies into their nests, wasps spent from 16 to 61 min in nests (26.6, 19, N = 19 observations) before leaving them again. Wasps with prey sometimes plunged headlong into nests, but usually they landed a few centimeters from them, lifted prey in the air, flew to perches on plants next to the nesting site, and then flew from these perches to their nest entrances. Several wasps dropped their prey (possibly due to investigator movements) and did not pick them up.

Miltogrammine flies *Metopia campestris* (Fallén) were frequently seen about the nesting site. They circled nest entrances, rested on tumuli, and entered nests for from 2 to 100 sec (18.0, 12, N = 21). One wasp cell contained two asilids and two maggots which may have been *M. campestris*.

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#### LITERATURE CITED

- Clark, P. J. and F. C. Evans. 1954. Distance to nearest neighbor as a measure of spatial relationships in populations. *Ecology* 35:445-453.
- Evans, H. E. 1960. Observations on the nesting behavior of three species of the genus *Crabro* (Hymenoptera, Sphecidae). *J. N. Y. Entomol. Soc.* 48:123-134.
- Evans, H. E. and M. J. W. Eberhard. 1970. The wasps. Univ. Mich. Press, Ann Arbor.
- Krombein, K. V. 1951. in: Muesebeck, C. F. W., K. V. Krombein, and H. K. Townes. Hymenoptera of America North of Mexico Synoptic Catalog. U.S. Dept. Agri. Monogr. No. 2. U.S. Govt. Printing Office, Washington, D.C.
- Kurczewski, F. E. and R. E. Acciavatti. 1968. A review of the nesting behaviors of the Nearctic species of *Crabro*, including observations on *C. advenus* and *C. latipes* (Hymenoptera: Sphecidae). *J. N. Y. Entomol. Soc.* 76:196-212.