

Nest Site Preference of *Chalybion zimmermanni* Dahlbom (Hymenoptera, Sphecidae)

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Abstract

A total of 198 nests of *Chalybion zimmermanni* Dahlbom from Indiana and Kentucky was examined and separated on the basis of the material in which each nest had been made. A distinct preference for nesting in pre-existing holes in wood was found, with 158 (80%) nests in this situation. There were 30 (15%) nests in deserted cells of *Sceliphron caementarium* (Drury); 8 (4%) in metal cavities, and 2 (1%) in deserted cells of *Trypargilum politum* (Say). Nests of *C. zimmermanni* are reported from 16 additional counties in Indiana and from 5 counties in Kentucky.

The first report of the occurrence of the wasp *Chalybion zimmermanni* Dahlbom (Hymenoptera, Sphecidae) in 7 counties of Indiana (2) indicated that it nested in pre-existing holes in wood and in the deserted mud cells of *Sceliphron caementarium* (Drury). Rau (1) reported that in Mexico this wasp commonly nested in deserted mud cells of *Sceliphron assimilis* (Dahlbom). If the habit of using *S. caementarium* nests were common, conflict could arise between *C. zimmermanni* and a related species, the more common blue wasp *Chalybion californicum* (Saussure), which nearly always nests in these deserted mud cells.

In 1970, *C. zimmermanni* was found in 16 additional Indiana counties, as follows: Bartholomew, Daviess, DuBois, Franklin, Gibson, Greene, Knox, Lawrence, Martin, Monroe, Orange, Posey, Spencer, Union, Warrick and Washington. The 23 counties where this wasp has been found form a belt extending diagonally from east to west across the southern boundary of the state, and reaching approximately 75 miles north of the Ohio River. It is presumed that the river formed a temporary barrier to the northward extension of this primarily southern wasp. A total of 117 nests was found in these 23 counties, with an average of 5.1 nests per site (Table 1).

TABLE 1. Summary of nest sites of *Chalybion zimmermanni* Dahlbom found in 1969 and 1970.

	Nest Location					Average nests per site
	Wood No. (%)	<i>Sceliphron</i> <i>caementarium</i> cells	Metal	<i>Trypargilum</i> <i>politum</i> cells	Total	
		No. (%)	No. (%)	No. (%)		
Indiana (23) ¹	78 (67)	29 (24)	8 (7)	2 (2)	117	5.1
Kentucky (5) ¹	80 (99)	1 (1)	0 (0)	0 (0)	81	16.2
Totals	158 (80)	30 (15)	8 (4)	2 (1)	198	

¹ Indicates number of counties.

A one-day search in 5 counties of northern Kentucky yielded a higher average count of nests than had been found in Indiana. This probably indicates a longer history of nesting in that region. The 5 counties are Bracken, Boone, Campbell, Grant and Pendleton. A total of 81 nests was found. The average number of nests per site was 16.2 (Table 1).

An equal amount of searching gave negative results in the following 7 Indiana counties: Decatur, Delaware, Henry, Randolph, Rush, Sullivan, and Tipton.

To obtain a fair sample of nest sites, observations were made in late spring and summer of 1970 to supplement those made in 1969. Judging by the wasp's activities in 1968 and 1969, the preferred nest sites were in sheltered places in old buildings where there was little disturbance by humans. There were wooden beams containing holes, sometimes made by burrowing beetle larvae, and a source of dry mud. The mud is used by the adult female wasp to plug the far end of the burrow, and to make a countersunk plug at the outer end of the completed nest. This mud commonly comes from old cells of *S. caementarium* or *T. politum* (2). The female *C. zimmermanni* carries water to moisten the dry mud to the proper consistency for transporting it back to her nest, often a distance of several feet.

A search was made for suitable old barns or sheds. When such a building was found, the interior was examined for the typical white uric acid plug with which the wasp closes her nest hole (2). Each building was searched for a total number of nests. Only one nest location was examined per county.

In 1969, 4 of the white-plugged nests were found in a deserted mud cell cluster of *S. caementarium*, so these nests were also sought.

From the 23 counties in Indiana, 67% of the nests were found in holes in wood; 24% in old *S. caementarium* cells; 7% in metal cavities, and 2% in old *T. politum* cells (Table 1). In Kentucky, 99% were in wood, and 1% in old *S. caementarium* cells.

The nests in metal were in the receptacles for cable electrodes in a welding machine on the James Clampitt farm in Lawrence County. These holes were approximately the diameter of *S. caementarium* cells and about 3 cm deep. The machine was used by the owner before the wasps emerged, and he cleaned out all but one of the cavities. This one contained a pupal case, and within it, a dead late larva on 10 July 1970.

Mention should be made of inadvertent trap nesting of this wasp in Bartholomew County, near Columbus, Ind., in a wooden workbench of Charles Ochs. Several years earlier he had bored 10 holes of slightly different diameter to test drill bits. The holes extended horizontally into the wood for about 3 cm. The presence of the characteristic white plugging material was noticed in 8 of the holes on 11 July 1970 (Fig. 1).

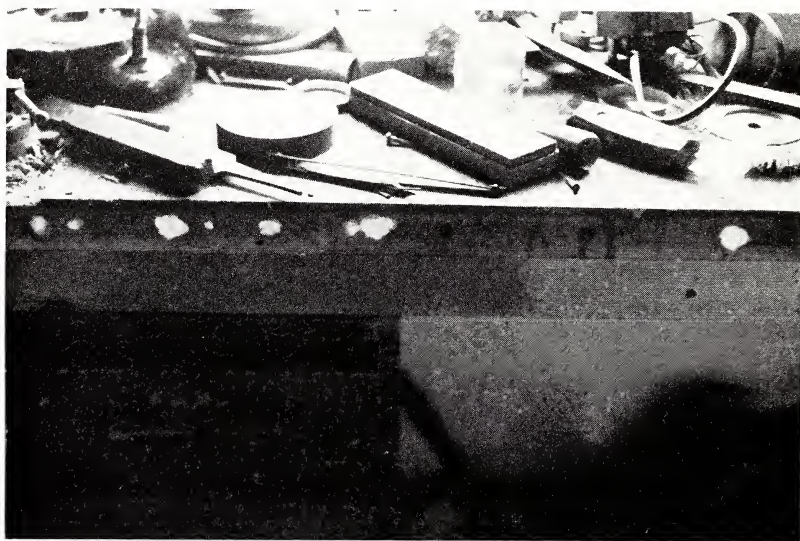


FIGURE 1. Front of workbench of C. Ochs near Columbus, Bartholomew County, Ind., showing 8 drill holes filled by *Chalybion zimmermanni* Dahlbom. Photographed 4 August 1970.

Acknowledgments

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