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WINTER OCCURRENCE OF *ZOROTYPUS HUBBARDI* (ZORAPTERA) IN TIPPECANOE COUNTY, INDIANA

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The states of Indiana, Illinois, and Iowa are at the northern periphery of the known range of *Zorotypus hubbardi* Caudell (Riegel and Ferguson, 1960). This species, the only species of Zoraptera found in Indiana, has previously been reported from Posey County (Riegel and Ferguson, 1960), Franklin County, Greene County, Vanderburgh County, and Warren County (Riegel, 1963).

During the summer of 1969, several students in the Department of Entomology at Purdue University collected specimens of *Z. hubbardi* from rotten logs in McCormick's Woods, located on the northwest edge of the Purdue campus (West Lafayette, Tippecanoe County). This is the first reported occurrence of this species in Tippecanoe County. This site along with two others in Warren County mark the northern edge of the range of *Z. hubbardi* in Indiana.

Riegel (1963) believed that this species overwintered in this area only in sawdust piles where they were heated by the decaying sawdust. (It also seems likely that they might overwinter in peat bogs where they would be heated by decaying vegetation.) However, on February 24, 1970, we collected specimens of *Z. hubbardi* in a white oak log (Fig. 1) in an



Figure 1. Log in which overwintering Zoraptera were found.

exposed area adjacent to the western edge of McCormick's Woods. The log had been on the ground from seven to ten years, the bark was missing, and the outer wood was bleached and dry. The zorapterans were found in old cerambycid galleries, actively moving over and

through ice crystals. Because of their close proximity to the ice in the log, it is probable that this species can tolerate much lower temperatures than previously believed, and it is quite probable that they are capable of overwintering in logs as well as sawdust piles and bogs.

LITERATURE CITED

- Riegel, G. T. 1963. The distribution of *Zorotypus hubbardi* (Zoraptera). Ann. Entomol. Soc. America 56: 744-747.
- Riegel, G. T. and M. B. Ferguson. 1960. New state records of Zoraptera. Entomol. News 71: 213-216.



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- P. 1, line 14. For Arnold read Armond.
- P. 19, line 18. For Ann read Ann.
- P. 21, line 19. For directely read directly.
- P. 29, lines 23 and 42. For Walckeneare read Walckenaer.
- P. 37, line 41 should read: Type:♀, Mt. St. Tomas,.....
- P. 38, line 4. For Homgren read Holmgren.
- P. 40, line 11. For summer read summers.



The hazards of entomological collecting. Maurice Sand, *Le monde des papillons* (Paris, 1867), 114.