

A Large Aggregation of Larval Millipeds, *Zinaria butleri* (McNeill), in Brown County, Indiana¹

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Early on the morning of June 9, 1957, Mrs. Melvin Carter, of Nashville, Indiana, called the writer in regard to a large aggregation of millipeds on her property near Gnawbone. The millipeds were reported to be lying in a strip about 12 feet wide by 25 feet long and in places piled to a height of 4 to 5 inches.

By 3 p.m. that afternoon, when the writer reached the locality, the dense aggregation had dispersed, but millipeds were still abundant at the surface. When the dead leaves on the forest floor were lifted, hundreds were uncovered feeding and moving about at every point examined over an area about 30 feet long by 20 feet wide. In places in which the leaf mat was intact one could hear the millipeds feeding below, and the whole area had a distinct odor of crushed cherry leaves due to the HCN gas released from the repugnatorial glands of the millipeds.

Dr. Nell B. Causey of the University of Arkansas kindly determined the species as *Zinaria butleri* (McNeill, 1888). The aggregation consisted primarily of light colored larvae in the last stadium mixed with a few fully colored adults and uncolored adults which had apparently only recently shed the last larval skin.

Large aggregations of *Z. butleri* are not uncommon, and according to Dr. Causey, seem to occur a year or two after a season that has been favorable for reproduction. Williams (1951) reports an unusual aggregation of adults, but large aggregations of larvae do not seem to have been noted in Indiana.

The aggregation in Brown County was on the upper slopes of a steep hill and seemed to center around a shallow drainage course. All millipeds seen in the afternoon were under or very close to the shaded portions of a cut-over woodland in which white and black oak, various species of hickory, red bud, sassafras, and sumac predominated. The forest floor was covered with a mat of leaves, apparently riddled by the feeding of the millipeds. *Desmodium* and some poison ivy were the only low vegetation in the area.

A number of the millipeds were brought back to the laboratory for study and several rough experiments were performed in an attempt to explain the concentration observed. It is apparent that *Zinaria*, like many other arthropods, moves more rapidly in dry air and slows down in moist air. Also they show a tendency to cling to another milliped whenever contact is made. When a moisture gradient is established the millipeds tend to concentrate in the area of greater moisture, and if some physical obstacle is interposed they pile up against it.

It was impossible to determine whether the aggregation observed in Brown County had developed in situ or the individuals had migrated

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from some other place in the area. The damage to the leaves suggests, however, that they had been there for some time. The dense aggregation observed by Mrs. Carter may have been due to the "trapping action" of higher humidity in a narrow strip associated with the shallow drainage course, and may have been preliminary to a migration out of the area.

Literature Cited

- WILLIAMS, ELIOT C. 1951. An unusual aggregation of the milliped, *Zinaria butleri* (McNeill). *Proc. Indiana Acad. Sci.* 60 (1950): 329-331.