THE SIGNIFICANCE
OF THE BREAK-DOWN OF OAK LITTER
BY ENOICYLA PUSILLA BURM. ¹

by

J. VAN DER DRIFT AND M. WITKAMP
(Institute for Biological Field Research, Arnhem, Netherlands)

The leaves falling in a forest every year during autumn build up a litter layer that is gradually attacked by a rich variety of organisms, ranging from bacteria of several μ to earthworms of more than 10 cm. This biological attack together with the effect of abiotic, physical and chemical influences form the decomposition process, which ultimately gives free minerals and CO₂—which are respectively leached or given off into the atmosphere—as well as humus substances which are very resistant to further decomposition.

In this decomposition process the biological attack is the most important, and because of the large variety of organisms involved, a very complicated one. To gain some insight into the mechanism of this process, it is necessary to evaluate the role of the most important groups of organisms, their succession and their mutual influence. In this paper the part played by a population of the terrestrial caddis fly larva Enoicyla pusilla Burm. (fig. 1) in the decomposition of the litter of oak coppice in 1957 will be analysed and also the influence of its activity on the subsequent decay of the litter material.

The adults of Enoicyla develop during September and October. Only the males have wings but they move only over short distances. They live for about two weeks, the unwinged females for about five days. Shortly after copulation the females deposit about fifty eggs in a gelatinous cover. The eggs hatch after about three weeks. The young larva immediately begins with the construction of its case (4).

On the first day the case already measured about 1.5 mm. In January the average length had increased to 3.3 mm, in March to 4.5 mm. In June the larva was full-grown and the case had a length

¹ It was intended to publish this paper in the supplement devoted to Prof. Dr. C. J. van der Klaauw. Unfortunately however, it was not possible to send in the manuscript in time.
The dry weight of the larva increased from 0.1 mg in January and 0.25 mg in March to 1.3 mg in June. Most growth occurred during March, April and May. Till the end of June the larva moved around but then a silken wall was constructed across the posterior aperture of the case and the larva burrowed into the soil.

During August and September the larva pupated, after having closed the anterior aperture of the case as well. About a month later the pupae opened the anterior lid and crawled to the surface, where the imago emerged.

The larva lives during its feeding-time in the litter layer. Under sufficiently damp conditions it crawls around and feeds on litter, moss and algae. During the main feeding period, March, April and May the largest amounts of oak litter were found to be taken in. Numerous gaps from the underside of the oak leaves to the upper epidermis and a great many skeletonized leaves (fig. 1) showed the effect of the feeding activity of *Enoicyla*. To value the significance of this species for the break-down of the litter we have to know the following items:

1. The average litter consumption of the larva.
2. The number of animals in the field.
3. The litter production in the field.