SCAVENGING BEHAVIOR IN LEAF-FEEDING CATERPILLARS

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More than 99% of lepidopteran species are phytophagous (Strong et al. 1984, Pierce 1995). However, larvae of some species are carnivorous (Pierce 1995). For instance, some lycaenids feed on immature insects such as ants and aphids (Pierce et al. 2002), and some Hawaiian geometrids prey on active insects (Montgomery 1983). Cannibalism has also frequently been reported in the larvae of phytophagous moths and butterflies (Richardson et al. 2010). Furthermore, Wang and Daane (2014) observed larvae of a tortricid species eating dead larvae of conspecifics under laboratory conditions. These observations suggest that phytophagous lepidopterans may scavenge on dead insects in the wild. Although larvae of several moth groups, such as tineids, feed on dead animals (Stehr 1987), scavenging by phytophagous lepidopterans has rarely been reported under field conditions. In this study, we investigated the scavenging behavior of four species of leaf-feeding moth larvae in a forest in central Japan.

In May 2013, we observed an outbreak of the gypsy moth Lymnaitrria dispar japonica (Motschulsky) (Erebidae) in a secondary forest in Hiraoka-kouen, Higashiosaka City, Osaka, central Japan (34°40’N, 135°39’E). The larvae defoliated many tall trees, causing leaf-feeding caterpillars to move to the undergrowth. Thus, there were many caterpillars and their predators on the ground and guardrails in the forest; the mean densities of L. dispar japonica and other lepidopteran species were 2.1 and 0.5 larvae /m², respectively (Sugiura & Yamazaki 2014). Our observations were carried out along a hiking trail (900 m long, 2 m wide; 160–290 m above sea level) on May 4, 9, 13, and 18, 2013. Over 20,000 caterpillars (2.9 larvae/m² × 1,800 m² × 4 days) were observed on the ground and guardrails, although the number of larvae of each lepidopteran species was not counted. We recorded the species of lepidopteran larvae that were observed feeding on insect carcasses. The species and instars of scavenging larvae were identified based on morphology, color, and size (Sugi 1987).

Nine larvae of four species, namely, Phigalia verucundaria (Leech) (Geometridae), Lemyra imparilis (Butler) (Erebidae), Orthosia limbata (Butler) (Noctuidae), and O. paromoea (Hampson), fed on dead lepidopteran larvae (Table 1; Figs. 1–6). One O. limbata larva fed on the carcass of a conspecific (Fig. 4; Table 1), while the other caterpillars scavenged on dead larvae of other species (Figs. 1–3, 5, and 6; Table 1). All scavenging larvae were late instars. Larvae of these four species primarily eat tree leaves (Sugi 1987), suggesting that they are facultative scavengers. Because only 9 of...