OUTBREAK OF VARIABLE OAKLEAF CATERPILLAR, 
LOCHMAEUS MANTEO (LEPIDOPTERA: NOTODONTIDAE) 
AT THE KATHARINE ORDWAY PRESERVE-SWISHER 
MEMORIAL SANCTUARY, PUTNAM COUNTY, FLORIDA

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The Katharine Ordway Preserve-Swisher Memorial Sanctuary is located in northwestern Putnam County near the southern end of a deep sand formation known as the Trail Ridge. The preserve is a complex of xeric upland, mesophytic, and wetland communities (Franz & Hall 1990). During early August 1990, I observed large numbers of variable oakleaf caterpillars (Lochmaeus manteo Doubleday) at several sites on the Ordway Preserve. This common eastern North American moth undergoes sporadic population outbreaks that may result in the extensive defoliation of deciduous forests (Hooker 1908, Staines 1977, and Wilson & Surgeoner 1979).

The caterpillars were most abundant in mesophytic hardwood forests adjacent to the larger lakes and in the Mill Creek Swamp. At Tucker's Pond, frass falling through the foliage sounded like light rain and formed a thin layer on the ground. Laurel oaks (Quercus hemisphaerica Bartram) in the Tucker's Pond hammock were in various stages of defoliation. Many canopy-level laurel oaks 12 to 15 meters tall were completely defoliated. Smaller (1-2 m) understory laurel oaks ranged from nearly un eaten to completely defoliated. The caterpillars seemed to avoid tender new leaves, but readily fed upon mature foliage. Laurel oaks and water oaks (Quercus nigra L.) were similarly defoliated in the hammock along the Mill Creek Swamp.

Variable oakleaf caterpillars were also found on laurel oaks and water oaks in the hammock along the eastern edge of Ross Lake. This infestation was limited mostly to canopy-level trees in a few areas of the hammock. Although the oaks at Ross Lake were not noticeably defoliated, the sound of falling frass indicated that large numbers of caterpillars were present. Outside of the preserve but in the same general area of
Putnam County, I noticed severe defoliation of laurel oaks along State Road 100 between Putnam Hall and Grandin in mid-August, probably due to variable oakleaf caterpillars.

At least nine species of oaks occur on the preserve (Franz & Hall 1990), yet only laurel and water oaks were infested by *L. manteo* larvae. Sand live oaks (*Quercus geminata* Small), which have thick coriaceous leaves, were not infested at Tucker’s Pond hammock where many laurel oaks were defoliated. None of the oaks growing in the sandhill habitats at Ordway were infested (even laurel oaks), perhaps due to the more xeric conditions and frequent fires that occur in these upland areas.

On August 4, 1990, the larvae at all of the Ordway sites ranged from third to fifth instar. Many of the mature larvae that I collected advanced into the prepupal stage the next day. In the lab, most of the larvae pupated and a few adults emerged by August 24, 1990. Kimball (1965) lists adults of *L. manteo* as occurring from May-October in Florida.

Variable oakleaf caterpillars have a strong chemical defense which helps protect them against vertebrate and invertebrate predators. When disturbed, the larvae spray a pungent mixture of formic acid and ketones from a gland opening on the ventral side of the prothorax (Herrick & Detwiler 1919, Eisner et al. 1972). The spray has a waxy feel and seems to vaporize within a few minutes. If many larvae are handled, the formic acid may cause skin blistering (Herrick & Detwiler 1919, Kearby 1975). Even with this defense, however, *L. manteo* populations are affected by parasitoids (Surgeoner & Wallner 1975, 1978), pathogens (Ignoffo et al. 1978, Staines 1977), and occasionally birds and predaceous insects (Wilson & Surgeoner 1979, Staines 1977). No predation on variable oakleaf caterpillars was observed at the Ordway preserve and none of the 25 larvae collected yielded parasitoids.

Although freedom from predation may be a major factor allowing variable oakleaf caterpillars to occur in such abundance, climate may play a large part as well. 1991 was a year of extremely low rainfall in northern Florida (National Oceanic and Atmospheric Administration 1990). Lake levels at the Ordway Preserve during the fall of 1990 were the lowest that I have seen in six years of observation. No other outbreaks of variable oakleaf caterpillars have been reported from the Preserve, including 1991, which has had normal rainfall. Dry conditions may have set the stage for an outbreak to occur by weakening host trees or inhibiting natural mortality factors.

Preserved larvae and pupae of *L. manteo* from the Ordway Preserve have been deposited in the Florida State Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville.

REFERENCES CITED


PRELIMINARY POPULATION ASSESSMENT OF *PSYCHODA ALTERNATA* (DIPTERA: PSYCHODIDAE) IN SOIL IRRIGATED WITH WASTEWATER FOR TURF CULTIVATION

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The trickling filter fly, *Psychoda alternata* Say, tolerates strong sewage and thrives free from interspecific competition in many habitats heavily polluted with organic material (Rutz et al. 1980). This fly inhabits biological filter beds in sewage treatment plants (Rachinsky & Pettry 1968), hay infusion (Haseman 1907), decaying vegetables, cow and horse dung (Turner 1925), seaweed piles (Saunders 1928), and anaerobically-digested sewage sludge (Redbord et al. 1983). Another habitat of *P. alternata* occurs in Jacksonville, Florida, where 6-8 million liters of wastewater derived daily as a by-product of a beer brewing process are discharged through pivot irrigation onto large circular land areas to grow turf. The nutrient-rich wastewater discharged over several hundred hectares facilitates the development of large populations of *P. alternata*. The relatively short life cycle (5-14) days of *P. alternata* is also conducive to rapid buildup of populations. The adult flies emerge in large numbers and pose severe nuisance problems to workers at the turf farm and also to the nearby residents even though they are weak fliers. In April 1988, we assessed larval, pupal, and adult populations of *P. alternata* in different operational areas of the farm.

The turf farm is located at approximately 81°46' W longitude and 30°31'N latitude in Duval County, Florida. There are 14 semi-circular to circular areas ranging from 6 to 40 ha. All of these areas are not simultaneously cultivated to turf and irrigated at