

Forest Tent Caterpillar

Aspen defoliator makes no tent

Name and Description—*Malacosoma disstria* Hübner [Lepidoptera: Lasiocampidae]

Adult forest tent caterpillars are stout-bodied and light yellow to yellow-brown and have a wingspread of 1-1 1/2 inches (2.5-3.8 cm) (fig. 1). The forewings have two darker oblique lines near the middle. Eggs are cemented together and coated with a frothy, glue-like substance that hardens and turns a glossy dark brown (fig. 2). Newly hatched larvae are nearly uniformly black, about 1/8 inch (3 mm) long, and conspicuously hairy. With each successive molt, the characteristic markings of mature larvae become more evident—pale blue lines along the sides of a brownish body with a mid-dorsal row of keyhole- or footprint-shaped, whitish spots on a black background (fig. 3). When full-grown, caterpillars are about 2 inches (50 mm) long. Cocoons are composed of dense, yellowish silk with a powdery material dispersed between the strands.



Figure 1. Adult forest tent caterpillar. Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.

Hosts—Hosts include many hardwood tree species and preference varies by location. In the western United States, aspen is the preferred host, although alder, basswood, birch, cherry, cottonwood, elm, oak, poplar, various fruit trees, and willow are acceptable. If trees are defoliated, atypical hosts such as understory shrubs and the leaves of fruit and vegetable plantings may be fed upon by hungry, wandering larvae.

Life Cycle—All *Malacosoma* spp. have one generation per year and similar life cycles. Young larvae hatch in spring when leaves are beginning to unfold and are gregarious. Colonies stay together and move about in a line, following silk trails that are laid down by the leaders. Unlike other North American species of *Malacosoma*, the larvae do not construct tents. Instead, they spin silken mats on tree trunks or branches where they congregate when not feeding (fig. 4). The larvae feed for 5-6 weeks, becoming solitary in habit during the last stage. If large populations result in complete tree defoliation, the last two larval stages will wander in search of food. When full-grown, larvae disperse and spin dense silk cocoons, within which they pupate. Cocoons can be found in folded leaves, bark crevices, or other sheltered sites. The moths, which emerge about 10 days later in late July, are most active at night. Strong winds can carry the moths over long distances, and great numbers are attracted to lights. The eggs are laid mostly on upper-crown branches in masses of 100-350, which completely encircle small-diameter twigs. Inside the eggs, embryos develop into larvae that overwinter and hatch in the spring.



Figure 2. Egg masses of forest tent caterpillar, showing an old, hatched mass on the left and a new mass on the right. Photo: James B. Hanson, USDA Forest Service, Bugwood.org.

Damage—Forest tent caterpillar is the most widely distributed and destructive tent caterpillar in North America. In many areas, short-duration outbreaks result in intense



Figure 3. Mature larva of forest tent caterpillar displays the characteristic "keyhole" pattern down the back and distinctive blue markings. Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.

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defoliation, particularly to aspen. Forest tent caterpillar outbreaks have been known to occur across vast areas of the Lake States and prairie provinces of Canada, but less so in Colorado and Wyoming. Defoliation can result in reduced tree growth, top-kill, tree mortality, and impairment of aesthetic values. During years when forest tent caterpillars are especially abundant, they strip host plants of foliage and then wander across open ground in search of additional food sources, becoming a hazard for automotive traffic, trains, and pedestrians. A major natural enemy of forest tent caterpillar, the “friendly fly” *Sarcophaga aldrichi* Parker [Diptera: Sarcophagidae], becomes extremely abundant and contributes to the termination of forest tent caterpillar outbreaks in aspen. Although they do not bite, clouds of this friendly fly alighting on people and regurgitating on them and their clothing can be exceedingly annoying. During forest tent caterpillar outbreaks, the loss of shade, the nuisance occasioned by wandering caterpillar hordes, and incessant harassment from the friendly fly can negatively impact recreational use of an area.

Management—Forest tent caterpillar outbreaks are usually of short duration, lasting 3-5 years. Many factors regulate population size and contribute to outbreak collapse, including potent viral and fungal diseases, parasitic flies and wasps, predatory insects and birds, starvation, and, occasionally, unseasonable cold weather immediately prior to, during, and right after egg hatch.

On small, ornamental trees and shrubs, the egg masses can be removed by hand and destroyed between July and the following spring. After hatching, young colonies of larvae can be removed from branch tips or squashed while they are resting in dark clusters on the main stem, especially in the evening or on cool days. In June, when the caterpillars are migrating, a sticky or slippery collar can be placed around the base of trees as a barrier, affording trees some protection.

Several insecticides are registered for forest tent caterpillar control, all of which are most effective if applied when the larvae are small. Some registered insecticides have activity against Lepidoptera only, which spares important insect natural enemies because they are immune. Limitations of such products include: some defoliation occurs after the insecticide is applied because the material must be ingested to take effect; the product is easily washed away by rain; and it will only kill larvae that are very small. Area-wide control in a forest setting using insecticide has been and will likely continue to be employed in locations with a significant outbreak history in order to protect values and activities at risk such as growth increment on high-value trees and recreation.



Figure 4. When not feeding, forest tent caterpillars congregate on a silken mat to rest and to molt. Photo: James Solomon, USDA Forest Service, Bugwood.org.

1. Batzer, H.O.; Morris, R.C. 1978. Forest tent caterpillar. Forest Insect and Disease Leaflet 9. Washington, DC: U.S. Department of Agriculture, Forest Service. 8 p.
2. Furniss, R.L.; Carolin, V.M. 1977. Western forest insects. Misc. Publ. 1339. Washington, DC: U.S. Department of Agriculture, Forest Service. 654 p.