Western Tussock Moth

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A subspecies of the western tussock moth (*Orgyia vetusta gulosa* (Boisd.) = *Hemerocampa*) is an important defoliator of valuable big game browse plants including snowbrush ceanothus, bitterbrush, and, to a lesser extent, willows, serviceberry, wild rose, desert peach, and bittercherry. It also has damaged numerous kinds of fruit trees. The moth occurs in California, Oregon, Washington, British Columbia, western Nevada, and Boise County, Idaho. The Idaho population has been known for over 10 years and is isolated from the rest of its range. Possibly it was introduced there accidentally.

Outbreaks tend to be localized because the female cannot fly. When caterpillars are abundant, they defoliate their host, which results in branch killing. In one Idaho plantation, after they had defoliated the trees, the caterpillars moved onto young ponderosa pine trees, which they partially defoliated. In California, feeding injury to the fruit of young apple trees makes the apples look scabby when they heal over. It is also an economically important pest of orange trees, destroying the new spring growth and up to 80 percent of the newly set fruit.

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Evidence of Infestation

Though the young caterpillars are present in late spring, they are likely to escape detection because they are small and they cause minor damage. However, in June, the larvae get large, and they and their feeding injury become easily visible. Shrubs may be completely defoliated by mid-June. After larvae have transformed into adults and left the plants, the cause of defoliation can be inferred from their cocoons and the egg masses attached to the lower stems.

Appearance and Habits

The adult male (fig. 1, left) has wings with an expanse of 18 to 27 mm. He is generally brownish. The topsides of his forewings are darker with grayish areas and two irregular darker markings that cross at one-third and two-thirds of their length. At rest, the male's wings form roughly a triangular outline when viewed from above.

The female moth (fig. 1, right) is 12 to 15 mm. long when filled with eggs but much smaller after oviposition. She has only rudimentary wings and cannot fly. Her integument is glossy dark brown

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and is almost completely covered with wavy, whitish-gray hair. During oviposition, the female is atop the egg mass as though she were attempting to brood it or protect it as a hen does her eggs. On shrubs, most egg masses are deposited not more than a foot above ground.

Eggs of the western tussock moth are 1.2 mm. in diameter, more or less spherical, and opaquely white. The shell is rather hard and is depressed on top. Eggs are laid in closely matted white masses (fig. 2, top) on the mother's cocoon attached to twigs or on the bark of the larger stems. These masses often contain over 100 eggs each and incorporate hairs and scales from the female's body.

Life Cycle

One generation is produced each year. In warmer areas, moths are present from May to July but occur only in July in Nevada and Idaho. Females mate immediately after emerging from their pupal cases and eggs are laid within 3 or 4 days. Eggs hatch during the following spring from March through early June. The larval stage lasts 1-½ to 2 months; the pupal stage 2 to 3 weeks. In Idaho and Nevada, at elevations of 4,000 to 5,000 feet, adults emerge in mid-July, eggs hatch in late May or early June, and larvae mature in late June and pupate in early July.

There are five larval instars. When small, the hairy caterpillars are dispersed by wind. The mature caterpillar (fig. 2, bottom) is approximately 25 mm. long (about 1 inch). Its head and background color are blackish brown. Each body segment contains four to six red spots, set off against yellow longitudinal stripes, which are the sources of moderately long, radiating yellowish-white hairs. In the middle of the back there are four uniformly honey or whitish hair tufts, sometimes tipped with

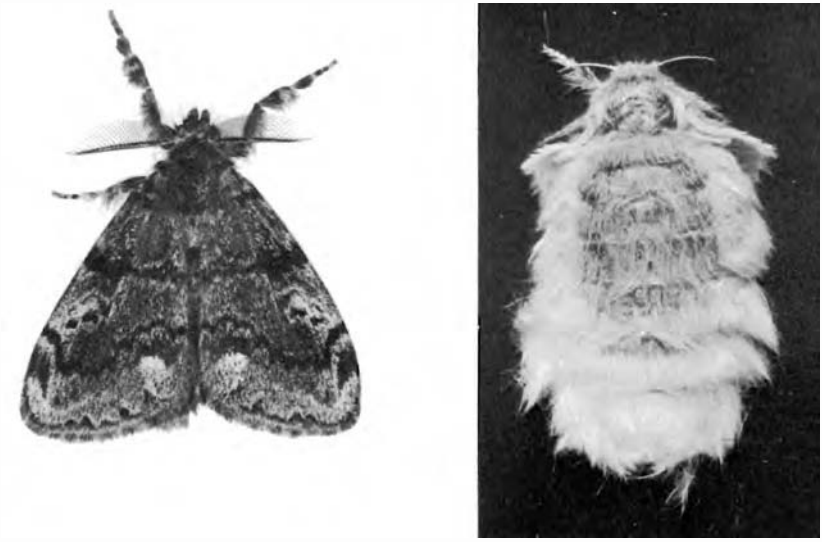

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Figure 1.—Western tussock moth: *Left,* Adult male; *right,* adult female.

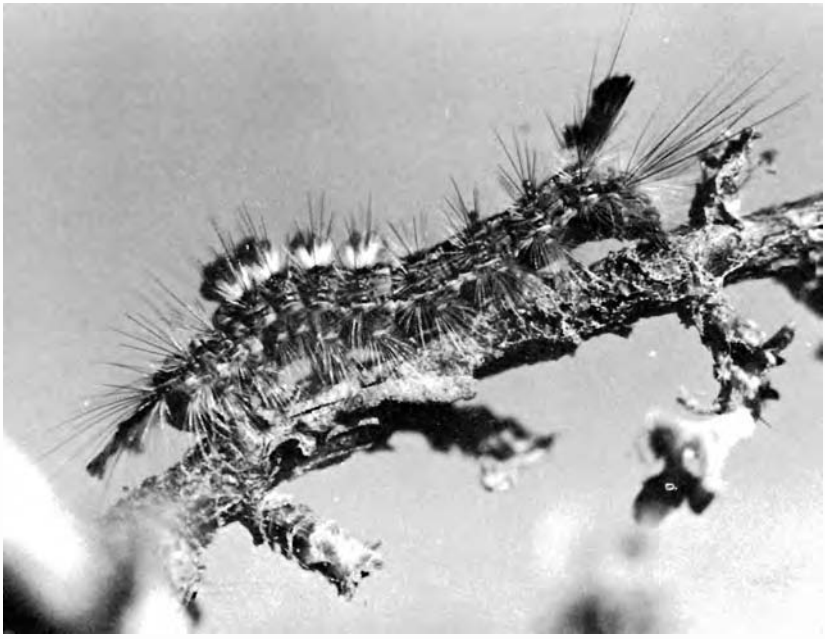

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Figure 2.—Western tussock moth: *Top*, Egg mass on cocoon; *bottom*, full-grown larva.

black, and two long, plumed, anterior black tufts, plus one posterior, black, horn-like tuft.

The cocoon is composed of loosely woven grayish-white silk containing many of the larval hairs. The male pupa is 12 mm. long. glossy, translucent brownish black, with wing pads extending down to the abdominal segments, and the conspicuous comb- or feather like antennae curving down from the head somewhat like ram's horns. The female pupa is about 16 mm. long, glossy, translucent, light yellowish brown, with shorter wing pads and antennae less conspicuous than the male's.

Natural Control

Natural enemies of the tussock moth include eight parasites, two predators, and a polyhedral virus. The parasites and predators have been credited with reducing the number of tussock moths by 50 percent in citrus groves and apple orchards.

Wasps that parasitize moth eggs include an encyrtid, *Ooencyrtus californicus* Gir. and a scelionid, *Telenomus* sp., probably *californicus* Ashm. Caterpillars are commonly attacked by several ichneumon wasps: *Iseropus orgyiae* (Ashm.), *Coccygomimus sanguinipes* (Cress.), and *Phobocampe* sp. (which itself is parasitized by a pteromalid, *Dibrachys cavus* (Walk.)). Other parasites of caterpillars are a braconid, *Bracon xanthonotus* Ashm., a pteromalid, *Brachymeria ovata abiesae* (Gir.), and a tachinid fly, *Patelloa fuscimacula* Ald. and Webb. Predators include a dermestid beetle, *Trogoderma sternale* Jayne var., which is common on moth eggs, and an anthocorid bug, *Lyctocoris campestris* (F.) which feeds on moth pupae but is not common.

In Idaho, the virus has controlled moth outbreaks. The virus does not kill the caterpillars until they are grown, when most of their damage is done. Larvae killed by the virus hang head downward from the branches; the contents of their bodies liquify, and their skins rupture easily.

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