

Biology/Phenology

Biology and Distribution of the Apple Tortrix, *Archips fuscocupreanus* (Lepidoptera: Tortricidae), in Washington State, a Polyphagous Leafroller Pest New to North America

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The apple tortrix (AT), *Archips fuscocupreanus* Walsingham, was first found in North America in 1995, during a Washington State Department of Agriculture (WSDA) exotic pest survey of western Washington State. AT was previously known to occur only in Japan and Korea, where it is an economic pest of apple, pear, and mulberry and also feeds on a broad range of native and introduced plants. Initial identification of AT was provided by J. Powell, at the Essig Museum, UC Berkeley, and subsequently confirmed by D. Adamski, at the USDA Systematic Entomology Laboratory in Washington, D.C.

Information on AT biology and economic status is scarce, but available literature describes AT as one of the 3 or 4 more important species of leafrollers in Japan and subject to control in commercial apple production on a continuing basis. AT biology includes the following:

- AT is univoltine and overwinters in the egg stage, primarily on trunks and branches.
- Eggs hatch from early April to early May.
- Larvae feed until mid-May or June, then pupate on the host (or possibly in the soil).
- Adults appear mid-June to early July. Eggs are laid in July, which then overwinter.

Over 950 AT were collected in 5 counties in western Washington (Whatcom, Snohomish, King, Pierce, and Thurston) in 1995. Catch was highest in the King to Thurston county area. A 1996 survey found AT in Skagit county, but not south of Thurston county or in eastern Washington.

Evaluation of AT biology in 1996 was complicated by the inability to identify immature stages of AT, which required rearing of specimens to adult for ID. Similar species, found on the same host plants and in the same areas as AT, are the obliquebanded leafroller, *Choristoneura rosaceana*, and European leafroller, *Archips rosanus*. The latter species is essentially identical to AT in the adult stage. Definitive identifying characters are known only for adult male AT (genitalia). Efforts to find identifying characters for immature and female AT are continuing. Fortunately, the pheromone lure used in the initial and subsequent surveys for AT (z-11-tetradecenyl acetate) was determined to be very selective, effectively attracting AT but not *A. rosanus*.

AT and *A. rosanus* were the dominant species of leafrollers found in a survey of 22 potential host plants in the Olympia area. Together those species comprised 84% of the fairly abundant defoliator fauna (42% each). AT was reared from apple, azalea, cascara, filbert, maple,

potentilla, cherry, Asian pear, and English laurel, more hosts than any other species present. The number of AT caught at 10 Olympia area trap sites in 1995 increased, but not significantly, in 1996. Adult flight for AT was recorded from late June to early August, with a broad (non-synchronous) peak through mid-July in 1996.