Eriophyid Mites

Eriophyid mite galls on Mt. Ash

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Eriophyid Mites

Mites are among the most common organisms in nature. More closely related to spiders and ticks than to insects, these tiny members of the arachnid class are unique in their physical structure and habits. Most mites characteristically have eight legs and lack both antennae and body segments. Many mites are common plant pests, and feed by inserting their mouthparts into their host plants and drawing out the plant's juices. Certain mites cause damage to the plant in the form of small dots (stippling) on the leaf tissue, and some cause growth distortions of the plant such as galls. Their feeding activities can lead to a general decline in the plants health, cause occasional leaf drop, or rarely, cause plant death.

Among the many different types of mites are the eriophyid mites, including the gall, blister, bud and rust mites, each of which distorts plant tissue in the manner they are named for. All eriophyid mites are very tiny; a hand lens or a microscope is needed to see them. Generally what most people see is the *distortion or alteration* of the host plant's tissues that has resulted from the mite's feeding activities. The relationship between eriophyid mites and their host plants is unique; in response to the mite's activities, host plants may

exhibit an array of different responses from harmless tissue alteration such as galls, to plant death. Eriophyids are selective in their choice of host plants, and each species prefers a narrow range of host plants. Most familiar are the gall-inducing eriophyids, though other eriophyids move freely about on the leaf surface, seeking shelter in natural irregularities on the plant's surface. Still other eriophyid mites bury themselves under bud scales or leaf bases to obtain food and cover. In Alaska, eriophyid mite activity is commonly observed as galls, or fuzzy mats on the foliage of both ornamental plantings and native hosts such as birch, mountain ash, and willow, usually with little or no discernible ill effects to the plant. Certain insects also induce galls on plants, and their activities are also easily observed.

Description

Eriophyid mites are among the most specialized of plant feeding organisms, maintaining a unique relationship with their host plant. In response to the mite's attack on the host plant, a localized growth reaction occurs, creating the visible gall or other plant abnormality. The mites are very tiny and observation requires a hand lens or microscope. Unlike the familiar spider-like forms of other mites, eriophyid mites are generally elongated, worm-like, and have only two pair of legs instead of the usual four pairs (Figure 1). Because of the

mite's small size, the galls or other plant abnormalities such as russeting, leaf folding, or blistering are the most observable clues that eriophyid mites are, or were, present.

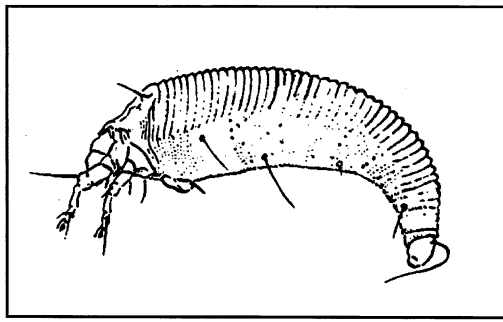

Figure 1. Eriophyid mite
(Actual size - ~200 microns)

Life History

The life cycle of many eriophyid mites is fairly simple; within a spring-summer season the mites develop through four growth stages: egg, first nymph, second nymph, and adult, which is also the overwintering stage. Certain eriophyid mites have a more complex life cycle which involves the alternation of a female-only generation with a male-female generation. This alternation of generations is more common in eriophyids that feed on deciduous plants, and seems to be an adaptation based on the seasonal changes of the host material. Overwintering, female-only mites are called deutogynes, and females associated with female-male generations are called protogynes. Deutogynes and protogynes within the same species can be entirely different in

shape and size, and are consequently difficult to identify. Eriophyid mites travel between hosts by air currents, or by hitching rides on insects or birds.

Plant Abnormalities Caused by Eriophyid Mites

Each species of eriophyid mite has a particular association with its host plant, and their feeding activities are concentrated on the plant's fleshy tissues. Plant abnormalities such as galls occur when the mites inject their saliva, which contains chemicals that act as plant growth regulators, into the host plants tissue's. The galls serve as special sites that mites develop for themselves to provide protection for their brood and to supply themselves with additional food - made available through the extra tissue in the gall. Eriophyid induced galls can be described in many different ways, and all occur on the soft parts of the host plant. Bladder, bead, finger, and pouch galls are examples, and each gall, regardless of type, is an individual gall, complete with an escape hole on the underside. (Figure 2).

Figure 2. Eriophyid mite galls on willow

Many galls become covered with hairs, or erinea, which are mite-induced plant hair growths. Erinea may also be induced by non-gall making mites which use the fuzzy growth much like the gall-making species use galls; the erinea is induced for food and shelter. Plants hosting erinea-inducing eriophyids have characteristic hairy or fuzzy pads on their leaf surfaces or other plant parts, and the erinea can often be colorful. (Figure 3).

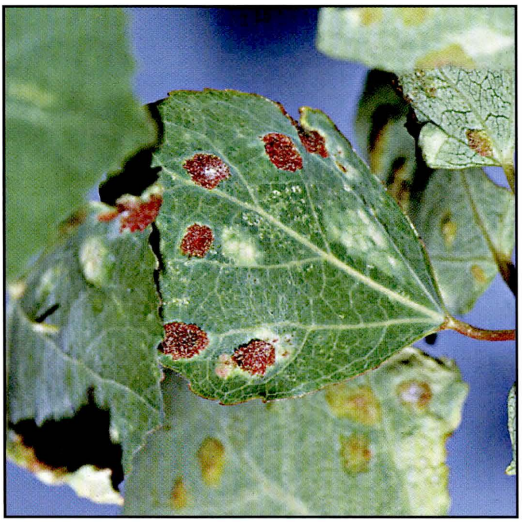

Figure 3. Eriophyid mite galls on aspen

Eriophyid mites can induce twig elongation, excessive bud production, or other forms of brooming as a result of their growth regulating salivary constituents. Eriophyids may also feed in developing individual buds, causing bud swelling referred to as "big bud", or may induce the plant to produce several bud galls along a twig. Eriophyid mites can further alter a plant's normal appearance by inducing

leaf edgerolling, or causing the leaf surface to blister in response to their feeding activities.

Management Options

Managing eriophyid mites in ornamental plantings is usually quite easy; removing and destroying the affected plant parts (generally leaves with galls or erinea) eliminates the immediate mite population as well as the visual signs of the mites. Early season examination of plant material can provide quick detection and allow for removal of newly infested parts. Some species overwintering as adults on deciduous trees may be controlled with an ultrafine horticultural oil spray applied in the fall, prior to leaf drop. Beneficial predaceous mites, however, may also be eliminated. Spraying the plant will not remove the galls nor erinea, but a late season application may control those exposed adult mites seeking overwintering sites, and consequently reduce the possibility of mite-induced galls or erinea appearing on the next year's new foliage.

Eriophyid mites occurring on native Alaskan plants are generally not considered serious pests, and often provide the observer with a chance to examine a unique relationship between a host plant and an inhabitant.

For additional information about eriophyid mites, contact the Alaska Cooperative Extension Integrated Pest Management program, the Alaska State Forestry office, or:

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