

demonstrates that there exists a problem in variety control. None of the questionable samples were represented as certified. (Certified sod is produced from authentic foundation stock and by means of procedures to minimize contamination.) The remote possibility of 'Floritam' being self-contaminated thru seed production suggests that the propagation characteristics of 'Floritam' are not a cause in the misidentity of sod samples. Rather, I suggest that confusion or misidentity of cultivar name occurred in some stage of the production or distribution of the grasses in question.

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SOME ERIOPHYID MITES OF SHADE TREES AND WOODY ORNAMENTALS (ACARINA: ERIOPHYIDAE)¹

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Abstract. Each year homeowners who grow woody ornamentals and shade trees may be concerned with malformed leaves on their plants. Leaf symptoms include leaf curling, fuzzy patches called erineum that may occur as a flat or indented pocket, stunted leaves, russetting of leaves, or various types of galls. The above problems are often caused by very small mites that belong to the family Eriophyidae. Often the species of mites are host specific, and the malformations produced are a specific response by that plant to a particular species of mite. Eight species have been selected from the genus *Eriophyes*, and their hosts, type of damage, and distribution are discussed.

Newkirk and Keifer (8) reviewed the types of *Eriophyes* and *Phytoptus* and described a new family, Nalepellidae. The other 2 families of eriophyids that are presently recognized are Eriophyidae and Rhyncaphytoptidae. These plant-feeding mites are thought to have originated more than 50 million years ago. A fossil rust mite, *Aculops keiferi* Southcott and Lange, was found in 37 million year-old North Moslin Sands in Australia (10). This mite is essentially the same morphologically as present day leaf-vagrant rust mites. *A. keiferi* and the Eriophyoidea of today have lost the 2 pairs of hind legs, most of the body setae, and most other body structures have been modified. Early workers did not realize that a small wormlike mite with reduced legs was the adult and postulated that certain spider mites (Tetranychidae) came from these small mites (3). M. de Reaumur (9) considered the mites found in various

eriophyid galls as maggots of small flies. Most of the early workers described mites based on the galls they produced. It was Nalepa who first recognized the difference between males and females and described about 10 new species a year for the 40 years he worked.

These mites cause different types of injury to plants. Those that cause galls are referred to as gall mites, those that feed in the buds are bud mites, those that wander over leaves and stems are vagrants, etc. Most of the gall-forming species belong in the family Eriophyidae. These mites apparently inject salivary juices into their host which cause galls, erineum, and other malformations to occur. Some species in the family Eriophyidae are a problem to shade trees and woody ornamentals. Eight species that illustrate some of these problems are discussed in the following.

Eriophyes buceras was described by Cromroy (2) from black olive, *Bucida buceras* Linnaeus, in Puerto Rico. The mite feeds on the underside of leaves and causes leaf distortion and patches of erineum (Fig. 1). Black olive is planted extensively as an ornamental in south Florida, and the mite is associated with this host throughout its range in Florida, West Indies, and Mexico to Panama.

Eriophyes chrysophylli was described by Cook (1) on the basis of the host and injury from a Cuban plant specimen of satin leaf, *Chrysophyllum* sp. The mite causes erineum patches on the upper leaf surface resulting in corresponding evaginations on the underside (Fig. 2). This mite is probably found wherever *Chrysophyllum* exists, which is the West Indies, Central America, and the northern tip of South America. It occurs in Florida as far north as Ft. Myers (Lee County) on the west coast and Lake Worth (Palm Beach County) on the east coast.

Eriophyes parulmi was described by Keifer (6) from American elm, *Ulmus americana* Linnaeus, in Wisconsin. He originally placed it in the genus *Aceria*, which was synonymized under *Eriophyes* by Newkirk and Keifer (8). It makes finger-like galls on the underside of the leaves

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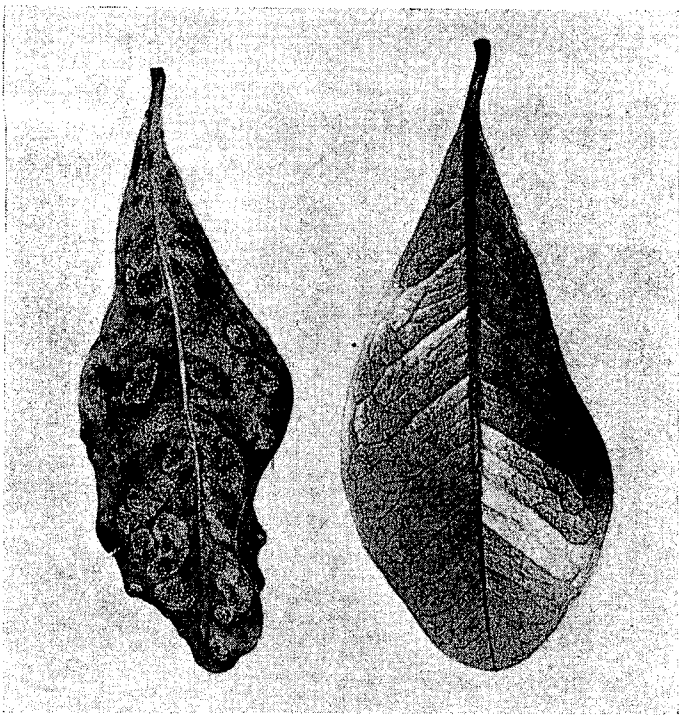


Fig. 1. *Eriophyes buceras* Cromroy on black olive, *Bucida buxera* Linnaeus.

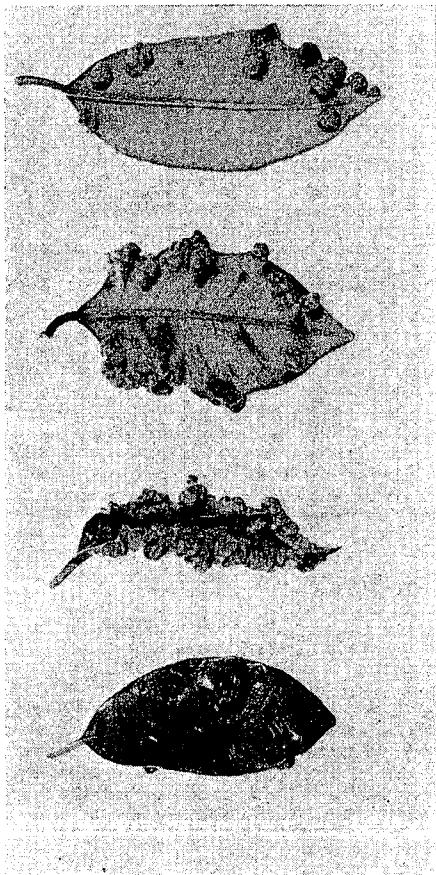


Fig. 2. *Eriophyes chrysophylli* Cook on *Chrysanthemum* sp.

(Fig. 3). This is a North American species and apparently occurs wherever the host occurs. It has been reported on *U. americana*, *Ulmus parvifolia* Jacquin, and *Ulmus* sp.

Eriophyes triplacis was described by Keifer (6) from white oak at Ithaca, New York. The mite feeds on the

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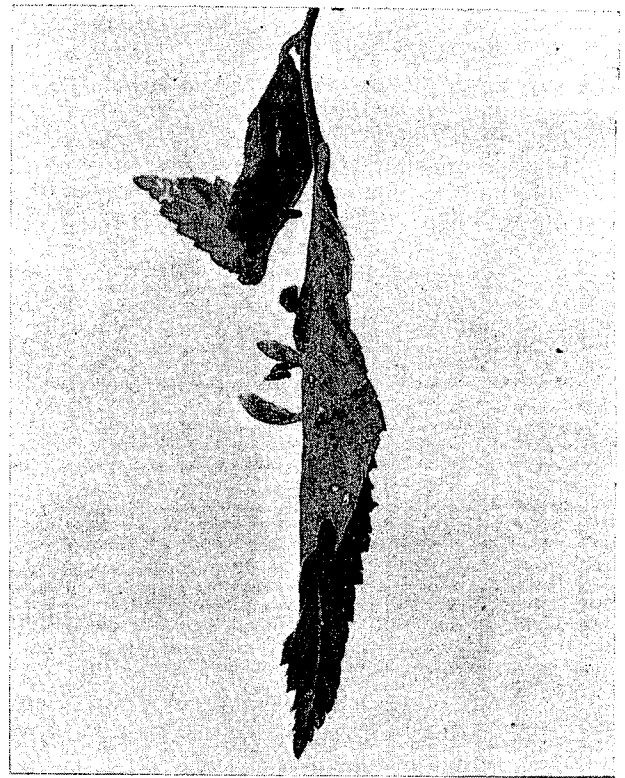


Fig. 3. *Eriophyes parulmi* (Keifer) on *Ulmus americana* Linnaeus.

underside of leaves and causes an erineum to develop (Fig. 4). *E. triplacis* is one of the oak and walnut group of mites that have a 3-rayed featherclaw. This appears to be a North American species found on laurel and live oak in Florida.

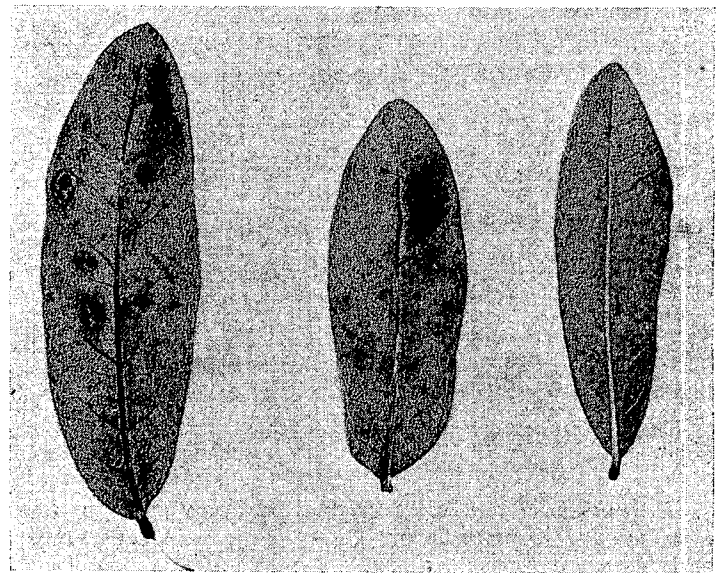


Fig. 4. *Eriophyes triplacis* (Keifer) on *Quercus laurifolia* Michaux.

Eriophyes quercinus was described by Keifer (7) from live oak, *Quercus virginiana* Miller at Davie, Florida. The mite makes leaf-deforming erineum patches (Fig. 5). More intensive collection on oaks should extend the range of this mite in Florida and probably other southeastern states.

Box elder erineum mite, *Eriophyes negundi*, was described by Hodgkiss (4) from black maple, *Acer negundo* Linnaeus from New York State. The erineum pockets this mite makes on the undersurface of box elder leaves (Fig. 6) protrude out above the upper surface (5). The erineum is a dull gray or tan. According to Keifer (in Litt.) this deutero-



Fig. 5. *Eriophyes quercinus* Keifer on live oak, *Quercus virginiana* Miller.

gynous mite (mites that have forms—protogyne, primary stage, and deutogyne hibernation or aestivation stage) needs more study from the areas originally collected by Hodgkiss. This is a North American species found on maple and box elder.

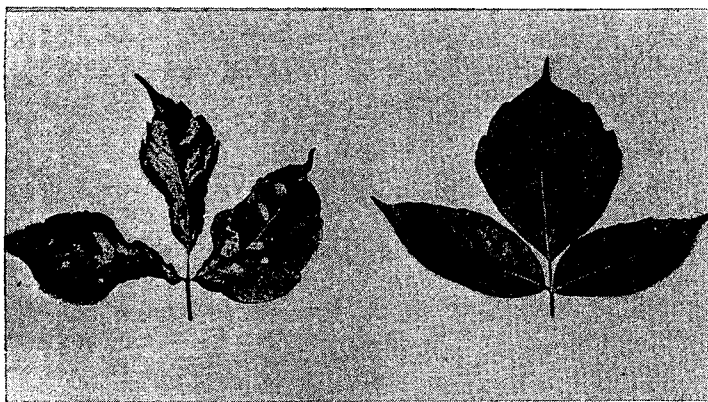


Fig. 6. *Aceria negundi* Hodgkiss on box elder, *Acer negundo* Linnaeus.

Eriophyes latanae was described by Cook (1) from *Lantana camara* Linnaeus from Cuba. The mite causes large galls which consists of a mass of very small green leaves, distorted flower buds and flowers (Fig. 7). It is used as a biological control agent where *Lantana* spp. is considered a pest rather than an ornamental plant.

Eriophyes new species was collected on pigeon plum, *Coccoloba diversifolia* Jacquin, from south Florida. The mite causes brown to dark brown erineum patches on the underside of the leaf (Fig. 8). It is known only from Florida. Once a plant becomes infested, the malformed leaves will remain with galls, erineum, etc., but proper controls for the mites can prevent other leaves from becoming infested.

These are a few examples of this economically important group of mites that are known to occur in Florida. New species are being described each year, but little informa-

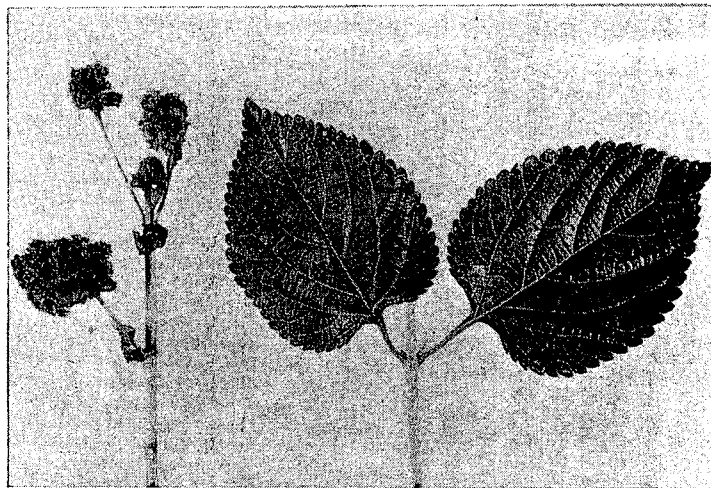


Fig. 7. *Eriophyes latanae* Cook on *Lantana* sp.

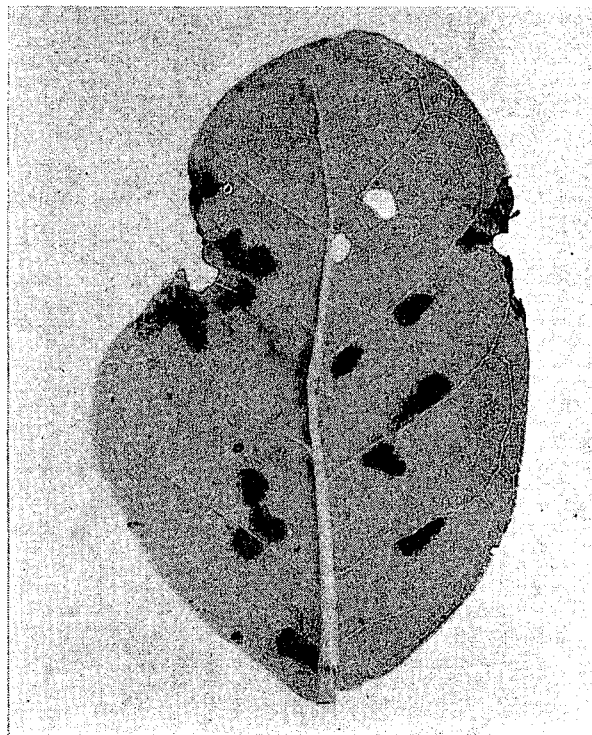


Fig. 8. *Eriophyes new species* on *Coccoloba diversifolia* Jacquin.

tion is known about the natural control. This will be an area for future studies.

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