



Identification Guide for Diseases of Tea (*Camellia sinensis*)

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The purpose of this guide on diseases associated with tea (*Camellia sinensis*) is to assist with problem identification and raise awareness of serious plant disease pathogens not yet present in Hawai'i. Blister blight, horse-hair blight, and twig dieback/stem canker are very destructive diseases found in major tea-producing regions, but they are not known to occur in Hawai'i. It is important to prevent such diseases from entering the state, because they are very difficult to eradicate or even to manage once established.

You should be aware that there is a risk of introducing new diseases into the state through infected plants even when they do not have obvious disease symptoms.

Early detection is often critical to success in eradicating new diseases. Familiarize yourself with the symptoms of serious tea diseases. Proper identification is essential for making sound pest management decisions. If you suspect problems but are unfamiliar with the disease symptoms, we recommend that you submit samples to CTAHR's Agricultural Diagnostic Service Center for identification. Samples for ADSC may be taken to the nearest Cooperative Extension Service office. For more information on collecting samples, see "Collecting plant disease and insect pest samples for problem diagnosis" CTAHR publication SCM-14, <<http://www.ctahr.hawaii.edu/oc/freepubs/pdf/SCM-14.pdf>>.

Algal leaf spot

Pathogen: *Cephaleuros virescens*

Symptoms

Leaves develop lesions that are roughly circular, raised, and purple to reddish-brown.

Alternate hosts

Algal leaf spot has a wide host range among tropical trees.

Life cycle

The alga produces microscopic, rust-colored, spore-like bodies on the surface of the leaf spots, giving them a reddish tinge. The "spores" are dispersed by wind or rain. The alga may spread from leaves to branches and fruit.

Poor soil drainage, imbalanced nutrition, and exposure to relatively high temperature and humidity predispose tea plants to infection by algal leaf spot, so it is important to strengthen the plant through proper cultivation and fertilization. Most algal spots develop on the upper leaf surface. Older infections become greenish-gray and look like



lichen. *Cephaleuros* usually does not harm the plant.

Control measures

Avoid plant stress. Avoid poorly drained sites. Promote good air circulation in the plant canopy to reduce humidity and duration of leaf wetness.

Brown blight, grey blight

Pathogens: *Colletotrichum* sp., *Pestalotiopsis* sp.

These fungi are considered weak pathogens and usually only affect plants that have been weakened by improper care or adverse environmental conditions. The disease is favored by poor air circulation, high temperature, and high humidity or prolonged periods of leaf wetness. When young twigs of susceptible cultivars are cut and used to root new plants, latent mycelium in the leaf tissue may start to invade nearby cells to form brown spots, and this may lead to death of leaves and twigs.

Symptoms

Small, oval, pale yellow-green spots first appear on young leaves. Often the spots are surrounded by a narrow, yellow zone. As the spots grow and turn brown or gray, concentric rings with scattered, tiny black dots become visible and eventually the dried tissue falls, leading to defoliation. Leaves of any age can be affected.

Alternate hosts

None are known.

Life cycle

The tiny, black spots on the lesions contain the fungal spores. Rain splash transports the spores from one plant or site of infection to another. If the spores land on a leaf, they germinate to start a new leaf spot or a latent infection.

brown blight



Control measures

Avoid plant stress. Grow tea bushes with adequate spacing to permit air to circulate and reduce humidity and the duration of leaf wetness.

grey blight and brown blight occurring in the same leaf



Blister blight

Pathogen: *Exobasidium vexans*

Blister blight is the most serious disease affecting shoots of tea and is capable of causing enormous crop loss. The disease is endemic to most tea-growing areas of Asia but is not known to occur in Africa or the Americas. Cloudy, wet weather favors infection. Shan or Indian varieties of tea are somewhat resistant to this disease.

Symptoms

Small, pinhole-size spots are initially seen on young leaves less than a month old. As the leaves develop, the spots become transparent, larger, and light brown. After about 7 days, the lower leaf surface develops blister-like symptoms, with dark green, water-soaked zones surrounding the blisters. Following release of the fungal spores, the blister becomes white and velvety. Subsequently the blister turns brown, and young infected stems become bent and distorted and may break off or die.

Alternate hosts

None; the only known host is *Camellia sinensis*.



Life cycle

The disease cycle repeats continuously during favorable (wet) conditions, and the spores are readily dispersed by wind. Spores that land on a leaf with adequate moisture will germinate and infect it, producing visible symptoms within 10 days. The fungus can directly penetrate the leaf tissue. The basidiospores have a low survival rate under conditions of drought or bright sunlight. The life cycle of the fungus is 3–4 weeks.

Horse hair blight

Pathogen: *Marasmius crinisequi*

Symptoms

Black fungal threads resembling horse hair are attached to upper branches and twigs by small brown discs. The fungus penetrates and infects the twigs from the discs and produces volatile substances that cause rapid leaf drop.

Alternate hosts

Nutmeg, rubber, coconut, cacao.



Life cycle

This pathogen is spread from infected twigs to healthy twigs by extending its hair-like threads.

Twig dieback, stem canker

Pathogen: *Macrophoma theicola*

This disease is capable of reducing yields and can kill entire plants. Rainy weather favors its spread, and dry conditions promote its development.

Symptoms

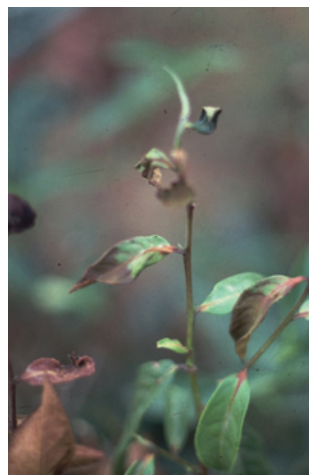
The first symptoms include browning and drooping of affected leaves. As the disease spreads into the shoots, they become dry and die. The entire branch can die from the tip downward. Dying branches often have cankers—shallow, slowly spreading lesions surrounded by a thick area of bark.

Alternate hosts

None are known.

Life cycle

The fungus produces spores on small, pear-shaped pycnidia on dead branches. Spores are spread when splashed by rain and can survive for several weeks on pruned branches left in the field. The fungus usually requires wounded plant tissue to gain entry and initiate infection.



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