



Coleosporium asterum

Identity

Preferred Scientific Name: *Coleosporium asterum*

Preferred Common Name: Western pine-aster rust, Needle cast- red pine

Other Scientific Names: *Coleosporium solidaginis* (Thuem), *Stichopsora asterum*

International names: Rust, Aster rust

Taxonomic Position: Kingdom : Fungi, Class: Pucciniomycetes, Genus: Coleosporium

Hosts/species affected

C. asterum has been reported mainly on species of Aster and Solidago (Sinclair et al., 1989). Solidaster, a cross between Aster and Solidago, is also a newly recorded host. Other hosts include Carnation (*Dianthus caryophyllus*), Chrysanthemum spp, Daisy (*Bellis perennis*), Geranium (*Pelargonium hortorum*), Gladiolus (*Gladiolus* spp), and Snapdragon (*Antirrhinum* spp.)

Growth stages affected

- Vegetative growing stage
- Flowering stage
- Postharvest stage

Biology

The rust fungi have complicated life cycle that include up to four different spore stages and one or possibly two distinctly different hosts. Infection on pine needles begins when spores released from the fungus growing on goldenrod or asters infect the needles causing small yellow spots. The fungus grows inside the needle where it overwinters. The yellow spots develop into white swelling, which grow well above the needle surface. The spore-producing structures split open and release orange



Figure 1. Pine needle rust fungus on golden rod.
Photo by: M. Grabowski, UMN Extension

colored spores, which then infect goldenrod and asters nearby. The fungus continues to produce spores that re-infect the alternate host until late in the season when spores that infect pine needles are formed, thus completing the rust's life cycle. The life cycle is completed in one year.

Symptoms

Infected plants develop lesions (pustules) on the lower surfaces of plant leaves or stems which increase in size and eventually rupture the epidermis and release spores. These spores are typically brightly colored (yellow, orange, purple, black, or brown) and are characteristic in diagnosing rust infections (Fig. 1). Pustules also can be present on the upper surface of leaves and can coalesce to form large necrotic areas (Fig. 3). Severe infections can result in premature leaf drop. Rust pustules also can form on stems and scapes, if present.



Figure 2. Brown rust pustules (*Coleosporium asterum*) on the underside of goldenrod leaves (*Solidago speciosa*); alternate host is pine (*Pinus*)

Means of movement and dispersal

Rust spores are carried by wind currents and also can be disseminated by water splash, but long-distance dispersal of rusts on ornamental plants is mainly attributed to the movement of infected plants (Wilson and Henderson, 1966)

Movement in trade

Movement in trade is through cut flowers and plants for planting

Impact

C.asterum has the potential to affect floriculture production because these pathogens cannot be adequately detected on symptomless but contaminated or infested propagation material. Rust fungi being obligate parasites do not usually kill infected plants. However, infection by rusts will reduce plant health and vigor, reduce flower production, and decrease the aesthetic value of ornamental crops due to the presence of pustules. Quarantine restrictions and eradication efforts can be costly and have a significant economic impact on floriculture production. Cut flowers such as *Aster*, *Solidago* and *Solidaster* grown for trade and as plants for planting are likely to suffer a large impact in the absence of controls.

Phytosanitary significance

Infected host plants or cut flowers originating from non-European countries are prohibited entry into the EU (Anon., 2000; Annex IIIA, point 1) .

Detection and inspection

Examining for rust spores and symptoms mainly on leaves of planting materials and cut flowers.

Management

- Integrated management practices including scouting and proper sanitation are used to manage rust outbreaks in floriculture crops and minimize potential disease losses.
- Increase the vigor of infected plants by watering during dry conditions and mulching to conserve water.
- water is necessary for infection, overhead irrigation should be avoided when rust is a problem
- Removal of alternate hosts such as wild or cultivated species of aster (*Aster*), goldenrod (*Solidago*), and several other members of the daisy or aster family (Asteraceae)
- Planting varieties that are resistant to rust
- Eradication of diseased plants and if infected cut flowers are detected on nurseries, the host plants should be held and examined for symptom development.
- Pruning off infected stalks
- Treatment of associated host plants and any alternate hosts that have been in close contact with any diseased plants with an effective fungicide with curative activity.

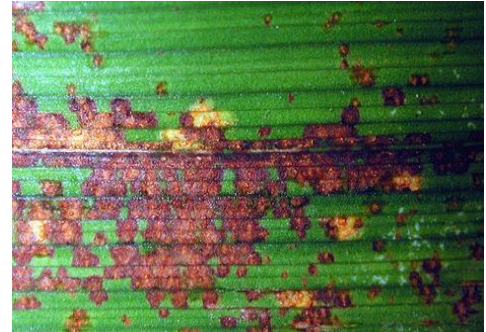


Figure. 3. Coalescing lesions of daylily rust. Photo by D. S. Mueller

References

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