

# Pacific Pests, Pathogens and Weeds - Online edition

## Erythrina gall wasp (268)

### Common Name

Erythrina gall wasp

### Scientific Name

*Quadrastichus erythrinae*

### Distribution

Asia, Africa, North and South America (restricted), the Caribbean (restricted), Oceania. It is reported from Fiji, Samoa, and Tonga. It is thought to be from East Africa originally.

### Hosts

*Erythrina variegata*, and other *Erythrina* species. There are more than 100 species worldwide in tropical and sub-tropical countries, and they are used as ornamentals, living fences, and also as shade trees for coffee and cocoa, especially as their roots form nitrogen-fixing nodules with *Rhizobium* bacteria.

### Symptoms & Life Cycle

The wasp lays its eggs in the youngest leaves and stems. As the larvae hatch they cause the galls to develop. The leaves become swollen and deformed, and look unlike the leaves of healthy trees (Photos 1&2). Repeated attacks cause dieback and death (Photo 3).

The larvae pupate in the swollen tissues, and the adults cut holes in the leaves and stems to emerge (Photo 4). The wasps are 1-1.5 mm in length, with the female being larger than the male (Photo 5). The life cycle is about 20 days.

Spread over short distances is by flight, on the wind, and perhaps on clothing. Spread over long distances is thought to be on fallen leaves perhaps on boats or planes.

### Impact

The damage is severe. Trees are defoliated by the gall wasp and often die as cycles of regrowth and attack result in loss of reserves. *Erythrina* seedlings are killed by infestations and this threatens stands of the tree. For example, in Hawaii about 95% of the *Erythrina sandwicensis* (wiliwili tree) and *Erythrina variegata* - important trees in the endangered lowland dry forest - have been killed by the gall wasp.

### Detection & inspection

Look for the mass of distorted swollen shoots on *Erythrina* trees, and seedlings, and trees that show die back.



Photo 1. Shoot of *Erythrina variegata*, caused by the Erythrina gall wasp, *Quadrastichus erythrinae*.



Photo 2. Close-up of Photo 1 to show the galls - gross distortions of the leaves and petioles of *Erythrina variegata*.



Photo 3. Dieback of *Erythrina variegata* caused by the Erythrina gall wasp, *Quadrastichus erythrinae*.



Photo 4. Galls of *Quadrastichus erythrinae* showing the exit holes of the gall wasp.

## Management

### BIOSECURITY

Boats carrying fallen infested leaves have been suggested as a pathway for spreading *Erythrina* gall wasp.

*Quadrastichus erythrinae* is on the Global Invasive Species Database (2021) of information on alien and invasive species that negatively impact biodiversity, managed by the Invasive Species Specialist Group of the IUCN Species Survival Commission:

<http://www.iucngisd.org/gisd/species.php?sc=965>.

### NATURAL ENEMIES

After extensive search for parasitoids in Africa and testing, scientists in Hawaii selected *Eurytoma erythrinae* to have the potential to bring the gall wasp outbreaks under control. Tests showed that it was a specific parasitoid of the gall wasp. Releases began in 2008, and have shown a substantial decrease in gall wasp populations. Importantly, *Erythrina* trees recovered with the production of healthy leaves and full canopies, although flowers of *Erythrina sandwicensis* still show damage. The release of another biocontrol agent, *Aprostocetus nitens*, an ectoparasitoid, is being considered.

### CULTURAL CONTROL

No control measures are recommended. Pruning has been tried, but was not successful. It is important, however, not to move *Erythrina* plants between localities where the gall wasp is present and where it has not yet established.

### CHEMICAL CONTROL

Injection of imidacloprid has been trialed, and is only recommended for highly valued ornamental trees because of the cost of this method.

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*When using a pesticide, always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticide to use should always be sought from local agricultural authorities.*



Photo 5. Male and female *Erythrina* gall wasp, *Quadrastichus erythrinae*.

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Information from Heu RA, et al. (2008) *Erythrina erythrinae* Kim (Hymenoptera: Eulophidae). New Pest Advisory. No. 05-03. State of Hawaii, Department of Agriculture; and from CABI (2015) *Quadrastichus erythrinae* (*Erythrina* gall wasp). Crop Protection Compendium (<https://www.cabi.org/cpc/restricted/?target=%2fcpc%2fdatasheet%2f46220>); and from Hawaii Invasive Species Council (2019) Invasive species: *Erythrina* gall wasp (*Quadrastichus erythrinae*). (<https://dlnr.hawaii.gov/hisc/info/biocontrol/latest-biocontrol/erythrina-gall-wasp/>). Photos 1&2 Albert (Bud) Mayfield, USDA Forest Service, Bugwood.org. Photo 3 Albert (Bud) Mayfield, USDA Forest Service, Bugwood.org. Photo 4 Richard Markham, ACIAR, Canberra. Photo 5 Erich G. Vallery, USDA Forest Service - SRS-4552, Bugwood.org.

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