

Pacific Pests, Pathogens and Weeds - Online edition

Heliconia rust (237)

Common Name

Heliconia rust

Scientific Name

Puccinia heliconiae. Also, known by an older name, *Uredo heliconiae*; a name that describes the type of spores produced by the rust.

Distribution

South America and the Caribbean. It is reported from Papua New Guinea, Solomon Islands, and Vanuatu.

Hosts

There are nearly 200 *Heliconia* species in Central and South America and in parts of the South Pacific. Many are grown as ornamentals. In Vanuatu, a wild species, *Heliconia indica*, is used to wrap starchy puddings, known as *laplap*, before they are cooked in an earth oven. A report from Papua New Guinea gives the host as *Heliconia* sp. Ornamental varieties, e.g., Golden Torch, Red Torch and Torch Adrian are reported to be susceptible in Brazil.

Symptoms & Life Cycle

Leaves become infected by spores of the fungus as they emerge, with one side showing infection before the other because of the way the leaves unfurl (Photo 1). These early infections form yellow streaks, 1-2 mm wide, on and between the veins from the midrib to the leaf margin. The spots turn brown, with those on the underside beginning to discharge masses of reddish-brown spores (Photo 2). Later, the leaves start to decay beginning at the margins (Photos 3&4), and within the leaf blade (Photo 5).

In Papua New Guinea, only one type of spore has been recorded in the spots on the leaves; the spores are called 'urediniospores'. Rusts have complex life cycles, but whether other spore types are produced on *Heliconia* or on other hosts is not yet known.

The rust spreads over long distance as spores in the air, and between plants in water splash. It may also be spread on leaves sold at markets (Photo 7). Leaf surfaces need to be wet for the spores to germinate and infect. A period of 6 hours is required.

Impact

The damage done by the rust reduces the number of *Heliconia* leaves available for household use and sale, as well as their quality. For example, the leaves are used as a thatch for making temporary shelters in gardens, they are also used to make umbrellas, makeshift sleeping mats, as covers for earthen ovens, and as wraps for cooking, especially the starchy puddings known as *laplap* in Vanuatu.

Detection & inspection

Look for the spots on the leaves, beginning on the youngest leaf. From above, the spots are yellow, in rows following the veins and, at first, there are usually more on one side than the other. From underneath, the spots are irregular, 1-2 mm, and reddish-brown. Look for the rusty coloured dry spore masses, and then rub a finger across the spots to see the powdery spores. Look for the brown spots that appear on both sides of the leaf as the younger spots age. Look for rots that start at the margins.



Photo 1. The yellow spots of the Heliconia rust fungus, *Puccinia heliconiae*, on and between the veins, often on one side of the leaf before the other.



Photo 2. Irregular, reddish-brown spots of the Heliconia rust, *Puccinia heliconiae*, on the underside of the leaf discharging spores. If rubbed with a finger, the spores in the spots create a rust-like stain, hence the common name.



Photo 3. Brown spots of the Heliconia rust, *Puccinia heliconiae*, appear on the upper leaf surface corresponding to those on the underside which are discharging spores. Soon after the margins of the leaves start to decay.

Management

QUARANTINE

Quarantine authorities should be alert to the risk in the trade in ornamental plants between countries where the rust is present and those where it has yet to be recorded. The disease has only limited distribution in the Pacific island countries, only recorded from Papua New Guinea and Vanuatu. However, some types of rust spores are adapted for long distance, high altitude, spread on wind currents, and there is a high possibility the rust will spread unaided throughout the region.

CULTURAL CONTROL

Rusts, in general, are difficult diseases to control, because spores are produced in massive amounts, and they spread easily and rapidly. Cultural control offers little as a way of managing this rust disease.

Before planting:

- As rust spores need several hours to germinate and infect, create conditions that reduce humidity, for instance: (i) space plants so that there is air movement between them, (ii) do not plant beneath dense shade.

During growth:

- Remove and destroy severely diseased leaves to remove sources of infection.

RESISTANT VARIETIES

None are reported. If leaves become too diseased to be functional for thatch, mats or other household items, it would best to use alternative plants, e.g. banana or *Pandanus*, which are not hosts of the rust.

CHEMICAL CONTROL

Where *Heliconia* leaves are used for making household items or for cooking it is not appropriate or economic to use a fungicide to manage the rust disease. Where ornamentals are grown for sale, fungicides may offer a practical solution. Several fungicides have specific activity against rusts, and would be effective as long as they were applied before or as soon as symptoms were detected. Some are useful protectants (e.g. mancozeb and coppers), others have eradicant properties (e.g. triazoles and strobilurins).

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 4. The lower surface of the leaf in Photo 3 showing that the spots of the Heliconia rust, *Puccinia heliconiae*, have turned brown on the left side and the margins are beginning to decay. On the right there are reddish-brown spots near the mid-rib and older brown spots nearer the margin.



Photo 5. Severely infected leaf with large patches of decay within the blade of the leaf and at the margins, caused by the Heliconia rust, *Puccinia heliconiae*.



Photo 6. All the leaves in this group are infected by the Heliconia rust, *Puccinia heliconiae*, and show various stages of the disease.



Photo 7. Rolls of *Heliconia* leaves at the market in Espirito Santo, Vanuatu, with symptoms of the Heliconia rust, *Puccinia heliconiae*. The leaves are used to wrap grated starchy foods mixed with coconut milk, called *laplap*.

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Information from Liberato JR, Ray JD, Ganua TG (2008) *Puccinia heliconiae* on *Heliconia* sp. in Papua New Guinea. Australian Plant Disease Notes 3(1):132-134. (https://www.researchgate.net/publication/315207379_Puccinia_heliconiae_on_Heliconia_sp_in_Papua_New_Guinea/link/59bb83d3a6fdcca8e55f9307/download)

Produced with support from the Australian Centre for International Agricultural Research under project PC/2010/090: *Strengthening integrated crop management research in the Pacific Islands in support of sustainable intensification of high-value crop production*, implemented by the University of Queensland and the Secretariat of the Pacific Community.

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