

The Acacia Gall Rust Fungus, *Uromycladium tepperianum* A fungal pathogen of Port Jackson (*Acacia saligna*) in South Africa

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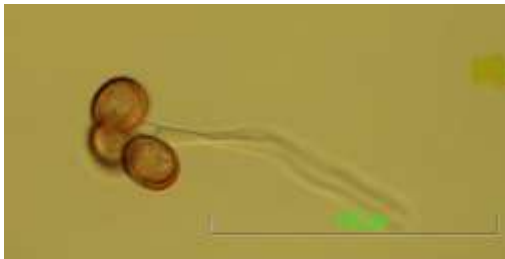


Description

Uromycladium tepperianum (Sacc.) MacAlpine is a rust fungus originating from Australia where it naturally attacks Port Jackson. It causes the production of large irregularly sized galls on the leaves and stems, as well as witches' brooms. The single-celled, brown teliospores are produced on pedicels, 3 teliospores to a pedicel. These are approximately 0.02 mm in diameter and ridged. The teliospores are produced in mass on the surface of the galls, appearing as a brown powder that is easily brushed off.

Life Cycle

The teliospores are spread by wind. After germinating they infect the tree by directly penetrating into epidermal cells of young phyllodes ("leaves"), stems and flower buds. From there they colonize the surrounding plant tissue and induce the formation of galls or witches' brooms. Teliospores are produced from May to about August. Germination occurs when there is freely available water on the plant surface (overnight dew or light rain), and the temperature is 10–20°C. These conditions are prevalent in spring in the Western Cape, when the plants are most actively growing and flowering.



Three teliospores of the gall rust fungus that have developed on a pedicel. Scale bar = 0.1 mm.



A teliospore of the *Acacia* gall rust fungus

Disease Symptoms

Infected Port Jackson trees are covered in conspicuous, knobly, red-brown galls, or sometimes witches' brooms, on branches, phyllodes or flowers. New galls often develop in February to March, the fungus having infected the plant at the end of the previous rainy season. New galls can be produced any time from then until late spring (while the tree is actively growing). The gall rust fungus uses the plants nutrients, resulting in a reduction of growth and seed production. Heavy gall loads lead to the plant not being able to cope with environmental stresses, especially drought over the dry months, and the plant then dies. The acacia gall rust fungus, like all rust fungi, can only live inside a living host plant. Once the plant dies the fungus also dies.

Method of Use

Uromycladium tepperianum spreads rapidly by wind blown teliospores, and is now distributed throughout the range of Port Jackson. There is therefore no need to artificially redistribute the gall rust fungus. Intense fires or clearing operations do result in the local extinction of the gall rust fungus, though it will naturally reinvade the area within a few years. To allow the maximum benefit of the gall rust, frequent fires should be avoided, as well as improperly executed clearing operations. These both benefit the plant and only result in an increase in the density of the weed. There is a saving on the cost of properly done clearing operations, with chemical treatment of the cut stumps, if done once the density of the weed is allowed to decline over time. It must however be borne in mind that follow up treatments will have to be done for many years because of the high numbers of long-lived seed already produced and which is stored in the soil. But again there is a saving due to the reduced number of seedlings that germinate.

Impact on Port Jackson

Before the introduction of *U. tepperianum*, Port Jackson was rapidly invading new areas and forming large, dense infestations covering large areas of the lowlands of the Western and Eastern Cape Provinces. However, since its release, the density of trees in invaded areas has declined dramatically (except immediately after fires and poorly executed clearing operations). Also the spread of the weed has almost halted. This allows the indigenous vegetation to continue living in the area, whereas previously they were crowded out by the dense infestations. It is expected that with time invaded areas will become open woodland with indigenous plants, and grasses, growing between the scattered Port Jackson trees.