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COFFEE RUST: A THREAT TO YOUR MORNING CUP OF JOE

Sathiya Aravindan V and V Ajay De Souza
M.Sc., Agri Plant pathology, Annamalai University.
e-mail: sakthivsd1312@gmail.com

INTRODUCTION

Coffee rust is one such disease which pose severe threat to the coffee growers all over the world. Coffee is one of the crops which is constantly being exposed to number of biotic phenomena including pests and diseases. Some of the well-known pests including coffee berry borer *Hypothenemus hampei*, Coffee leaf miner (*Leucoptera coffeella*) and various diseases including Coffee rust incited by *Wardia vastatrix* and coffee wilt caused by *Gibberella xylariodes* formerly called as *Hemileia vastatrix (*Hemi = half side of the spore is shiny and soft) and other side with rough minute protrusions). Later the name was changed to *Wardia vastatrix* as H.M. Ward who is considered as Father of tropical plant pathology who established the epidemiological phenomena between the host and the pathogen.

Name of the disease: Coffee rust

Name of the pathogen: *Hemileia vastatrix / Wardia vastatrix*

IMPACT

Coffee rust devastating the coffee production in Srilanka. In 1870 Coffee rust was identified to be caused by the fungus called *Hemileia vastatarix* and this was reported by H.J Berkeley. In the 1970's coffee rust was spreading from Africa to Brazil and thus causing the devastating effect. So, a safety zone of 80 kilometers was created to avoid the coffee rust spread but within 2 years coffee rust spread by breaking the barrier and causing severe devastation again.

SYSTEMATIC POSITION

Domain: Eukarya

Kingdom: Fungi

Phylum: Basidiomycota

Class: Pucciniomycetes

Order: Pucciniales

Family: Pucciniaceae

Genus: *Hemileia / Wardia*

Species: *vastatrix*

SYMPTOMATOLOGY

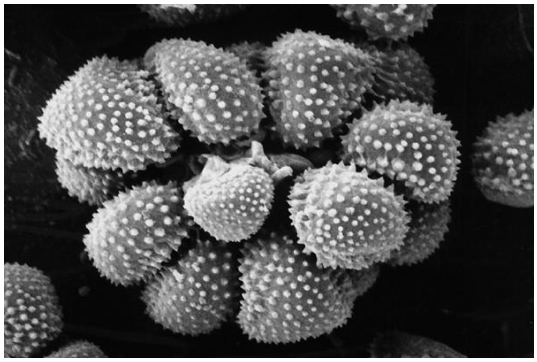
Symptoms on upper side

Symptoms on lower side

Small, yellow-colored powdery lesions which appears on the upper side of the leaves. On severe infection the lesions coalesce and enlarged and simultaneously the lesions turned into orange colored urediniospores. This disease has the enormous inoculum potential and can able to generate 3,00,000 to 5,00,000 urediniospores. Due to these lesions premature leaf fall occurs and leaves fall of incessantly thus it drastically reduces the yield.

PATHOGEN MORPHOLOGY

Producing asexual spores called Uredionospores (Uredospores) which are called as summer spores or repeating spores as they have the capability of producing millions of copies of uredinoispores



SEM photograph of Uredospores

Producing the sexual spores called teliospores or telutospores and they are called as winter spores as they overwinter in the off season. Coffee rust is also called as the autoecious demicyclic rust. Autoecious rust means that the rust pathogen does not require any other host to complete the life cycle. However, some scientist believed that *Psidum guajava* (Guava) serves as alternate host.

Demicyclic rust means that the rust pathogen completely lacks the uredial stage in its lifecycle. this concept of demicyclic rust is still under investigation.

EPIDEMIOLOGY

The spores mainly enter through the stomata and bursts out through the cuticle of the upper surface. As the frequency of the spores are higher in lower surface of the leaves. The spores of rust pathogen require good rain splash for them to germinate.

Temperature between 15 to 28 ℃ is highly conducive for the spore germination. However, 22℃ is highly optimal temperature for the spore germination

MANAGEMENT STRATEGIES

Cultural Methods

Growing the resistant varieties such as Cauvery to minimize the yield loss rather growing *Coffee arabica* which is susceptible. Planting the seedlings in well-spaced manner to avoid the dampness and this creates favorable conditions for disease development.

Chemical Methods

For rust disease the most commonly employed fungicide is the Sulphur fungicide. So, Sulphur dusting is done with duster at the rate of 25kg/ha

Biological Methods

Several biocontrol agents such as *Darluca filum* and *Penicillium brevicompactum* is also increasingly employed in controlling the rust disease. More recently *Penicillium brevicompactum* is employed in controlling the rust disease in many crops.