

DISEASES OF UNKNOWN ETIOLOGY IN BLACK PEPPER (*Piper nigrum* L.)

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Phytophthora foot rot and slow decline continue to be major disease problems in India. However in recent years, stunted disease of black pepper earlier known as little leaf disease (Sarma *et al.*, 1987, 1991) is gaining importance in India due to its increased spread more in high altitude regions of Kerala viz; Wynad and Idukki districts. This was also noticed in Pottangi area of Orissa State (Personal communication), again at a high altitude area. It is also noticed in the plains and occasionally in nurseries. In addition during 1986 another disease "Phyllody" was recorded in an isolated area in Wynad district. Little attention was paid to investigations of these diseases since the major attention was for foot rot investigations. So far these diseases have not been noticed in Karnataka and Tamil Nadu areas, the two important pepper growing states next only to Kerala.

Stunted disease : (little leaf disease)

This was first noticed in a ablack pepper nursery at District Agricultural Farm, Neriampalam, Idukki, Kerala during 1975 (Paily *et al* 1981). A similar disease was noticed in Pulpally of Wynad region in 1978 during routine surveys made by Scientists of National Research Centre for Spices (erstwhile CPRI Regional Station), Calicut. Disease of similar nature has been reported from Srilanka, Indonesia and Malaysia and the causal agents are not known. Investigation are underway to identify the causal agent.

SIMPTOM

Leaves of affected vines appear small, crinkled and leathery, chlorotic patches/streaks are also noticed. In severe cases, the leaves become

abnormally narrow and give a sickle shaped appearance. The inter-nodes of vines become abnormally short leading to typical stunting of plants. Because of bunching of leaves and branches, the affected branches give a typical witches broom appearance in advanced stages.

NATURE OF THE DISEASE

Fully and partially disease affected vines are noticed in the same garden. In case of partially affected vines, both healthy shoots free from any disease symptom and also branches with little leaf symptom are observed. Fungal and bacterial pathogens could not be isolated from roots and shoots of affected plants. Cuttings raised from infected branches showed typical symptoms indicating the systemic nature and disease transmission through cuttings. It is suspected to be caused either by Mycoplasma like organism (MLO) or a virus.

ASSOCIATION OF INSECT VECTOR

The role of insect as vectors of the disease is yet to be established. The following insect fauna have been recorded feeding on the infected

black pepper and also noticed on the live supports, *Erythrina indica*.

Tambinia sp.
(Tropiduchidae : Homoptera)

Leptocentrus sp.
(Membracidae : Homoptera)
Cow bug/Tree Hopper

Kolla ceylonica
(Cicadellidae : Homoptera)
Leaf hopper

Mandera sp.
(Cicadellidae : Homoptera)
Leaf hopper

Liothrips karnyi
(Phlaeothripidae : Thysanoptera)
Leaf gall thrips.

Studies are in progress to establish their role in disease etiology. Spraying of infected vines with zinc sulphate did not alleviate the symptoms. The affected vines treated with dimethoate (0.03%) and wettable sulphur (0.03%) did not recover. (Paily *et al* 1991).

The infected plants continue to flower for some time and later the yield declines, making the vines unproductive.

PHYLLODY DISEASE

This is also another disease, the causal agents of which are not known (disease of unknown etiology). This was recorded during 1986 in Puthady of Wynad district of Kerala (Sukumara Pillay *et al* 1987, Sarma *et al* 1988). The disease appears to be slightly different from little leaf disease.

SIMPTOMS

The diseased vines exhibit varying degrees of malformation of spikes and flowers. The affected spikes show elongated stalk and the flowers show varying degrees of abortion. They get transformed into narrow leaflike structures giving an appearance of a brush. In advanced stages leaves of affected vines become small and chlorotic. Flower buds also develop into mini fruiting laterals with nodes and internodes. The berries in the affected spikes appear oval instead of round. Like little leaf disease both healthy and infected branches are seen in a single vine.

NATURE OF THE DISEASE

Like stunted disease, very little is known on the etiology of the disease.

Both healthy and infected branches are noticed in a single vine. However as the disease advances, the diseased plants exhibit witches broom appearance.

Association of jassids with diseased vines has been noticed. Electronmicroscopic studies with affected spikes, showed presence of mycoplasma like organisms (MLO's) in the sieve elements, indicating their possible involvement in disease syndrome.

DISEASE MANAGEMENT

Since etiology of the disease is yet to be established, the measures that could effectively check the disease spread are of relevance.

1. Raising cuttings from apparently healthy runner shoots from affected vines and apparently normal vines in the vicinity of the diseased affected vines should be avoided.
2. Such diseased planting materials in nurseries should be separated and destroyed.
3. Infected vines in the garden should be uprooted and burnt to reduce the disease spread, since such vines as source of inoculum.

4. Movement of planting materials from infected regions to disease free zones should be avoided.

Further studies on etiology, nature of spread, role of insect vectors, of any, and also the effect of tetracyclines and zinc sulphate and other micronutrients on alleviation of symptoms of these two diseases are in progress.

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DISCUSSION

Dr. Sarma proposed the standard name of stunted disease in Indonesia, wrinkled leaf disease in Malaysia and little leaf disease in India, since the symptoms are similar. It is there agreed that the disease be called "Stunted Disease of Black pepper" in official way and "Stunted Disease" for shortterm.
