

Sclerotium rot - a new disease of vanilla (*Vanilla planifolia* Andrews) in India

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Abstract

A new type of bean rot affecting vanilla beans was observed in vanilla (*Vanilla planifolia*) growing tracts of Moovattupuzha in Ernakulam District (Kerala, India). The disease was characterized by rotting of bean bunches and subsequent development of thick fungal mat over the bean surface. The causal organism was identified as *Sclerotium rolfsii*; the fungus was brought into pure culture and its pathogenicity was proved. This is the first report of the fungus on vanilla from India.

Key words : anthracnose, *Sclerotium* rot, *Sclerotium rolfsii*, vanilla, *Vanilla planifolia*.

Vanilla (*Vanilla planifolia* Andrews), a perennial fleshy climbing orchid cultivated in several tropical countries, is susceptible to a number of fungal and a few viral diseases which cause considerable damage to the beans or to the whole plant resulting in heavy crop losses.

A survey was conducted during the south west monsoon season of 1999 in some of the vanilla growing areas near Moovattupuzha of Ernakulam District (Kerala, India) to study the occurrence of various diseases on vanilla. During the survey, a new type of disease affecting the beans was noticed from Ramamangalam. The disease appeared as rotting of a few or all the beans in a bunch. The rotting was initiated from the bean tips and advanced towards the stalk regions. The infected bunch was covered with a thick white feathery mycelial mat of the fungus especially on the distal portions of the beans. The infected beans showed rotting symptoms with deep sunken wound like areas, which appeared reddish brown in colour. Some of the beans were completely rotten. Running threads of fungal mat were also seen on the leaves and beans and rarely on stem also. Such plant parts also showed reddish brown sunken lesions.

Laboratory studies

The infected beans were brought to the laboratory

and after surface sterilization, portions were plated in Potato Dextrose Agar (PDA) Medium. The fungal growth on the infected specimens was also plated in PDA for isolation of the fungus in pure culture. In both cases a pure white-colored fungal growth was obtained which was very similar to the feathery white fungal strands observed on the infected beans in the field. Within 5 to 7 days, small creamy white sclerotial formations were noticed at the margins of the colony. On further incubation, the creamy white sclerotia increased in size and changed its colour to light brown and later to chocolate brown. The sclerotia measured 1-3 mm in diameter. More than 100-125 sclerotia were formed in a single PDA plate culture.

Pathogenicity studies

The pathogenicity of the fungus was tested on healthy beans using both the sclerotia and mycelial bits of the fungus obtained in the culture media. The sclerotia and 3 mm size culture discs of mycelium were inoculated separately to healthy beans, leaves and stems. The inoculated portions were kept moist by keeping a wet cotton pad, and covered with a polythene bag and incubated at 20-22°C. Three to four days after inoculation, fungal growth appeared on the beans and within 10 days the symptoms that were observed in the

field developed. The symptoms observed include development of rotten patches with sunken surface areas and these extended to the whole infected area. The formation of sclerotia was observed in later stages as rotting extended to other portions in the inoculated beans.

Culture characteristics and identification

In culture media, the colonies were fast growing, reaching about 9 cm dia within 3 days after incubation at 23°C. The mycelium was white and thick with many hyphal strands arising along the sides of the culture flasks or petriplates. Sclerotia were formed superficially and these were produced near the margin of the colony. The sclerotia were globose, smooth and found sufficient to initiate infection as shown by the pathogenicity tests. The fungus was identified as *Sclerotium rolfsii* Sacc. (Teleomorph = *Athelia rolfsii* (Curzi) Tu & Kimbrough, Syn. *Corticium rolfsii* (Curzi) (Domsch *et al.* 1980) which is an important plant pathogenic state of *Athelia* species. It belongs to Deuteromycetes of order Sterile Mycelia (Ainsworth *et al.* 1973).

S. rolfsii, a soil-borne pathogen, causes blight and root and stem rot in tropical and subtropical countries on more than 500 species of plants in about 100 dicotyledonous families comprising mostly of Compositae and Leguminosae (Aycok 1966). It thrives well at 25–35°C with high moisture, and attacks crowded plants on shady

habitats, while in dry soil the infection tends to occur below the soil surface. The principal propagules are the sclerotia produced by the fungus.

S. rolfsii has earlier been reported as a common pathogen in ginger and turmeric (Nair & Menon 1983). In ginger, the fungus causes thread blight disease while in turmeric it causes basal rot in the field and storage rot at the post harvest stage. A similar type of vanilla bean rot caused by *S. rolfsii* has been reported from China (Quiping 1995). However this is the first report of the fungus on vanilla from India.

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