Studies into Stemphylium floridanum Causing Leaf Blight of Viola

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Viola odorata Linn. a perennial ornamental plant, is commonly grown in gardens in pots for its fragrant and beautiful flowers. In Dharwar (India) the writers noticed a severe leaf blight of this ornamental plant due to which the leaves wither away and fall down. Microscopic examination revealed the presence of a dictyosporous which was identified as a species of *Stemphylium* Wallr. Although this host is known to suffer from various diseases like leaf spots, crown rot, Downy mildew, Powdery mildew etc. (Pirone, Dodge and Rickett, 1960), there is no report so far of a disease caused by *Stemphylium*. Hence an investigation into this new disease was carried out, and is presented here.

Symptoms

Symptoms (Fig. 1) on leaves start at the margins which become yellow and later turn grey. It spreads gradually towards the midrib and the entire leaf becomes grey on the surface. An olive grey coloured growth of the fungus is prominently visible on such surfaces. Curling of leaf margin upwards is common. In severe cases leaves appear blighted, wither away and fall down. Petioles are also affected which become black. Defoliation is the marked symptom in the advanced stage.

Identity and Diagnosis of the fungus

As none of the species of *Stemphylium* is reported to be parasitic on this host, a comparative study with its related species showed that the presented species resembled *Stemphylum floridanum* originally described by Hannon and Weber (1955) collected from tomato, in all the essential morphological characters (Graham and Zeiders, 1960, Tammen, 1963 Sobers and Seymour, 1963 Sobers, 1965). Hence it is diagnosed as *Stemphylium floridanum*, the brief description of which is a follows (Figs. 2, 3, 4 & 5): Conidiophores amphigenous, come out of epidermal cells, nonfasciculate, septate, with 1—4 nodular swel-

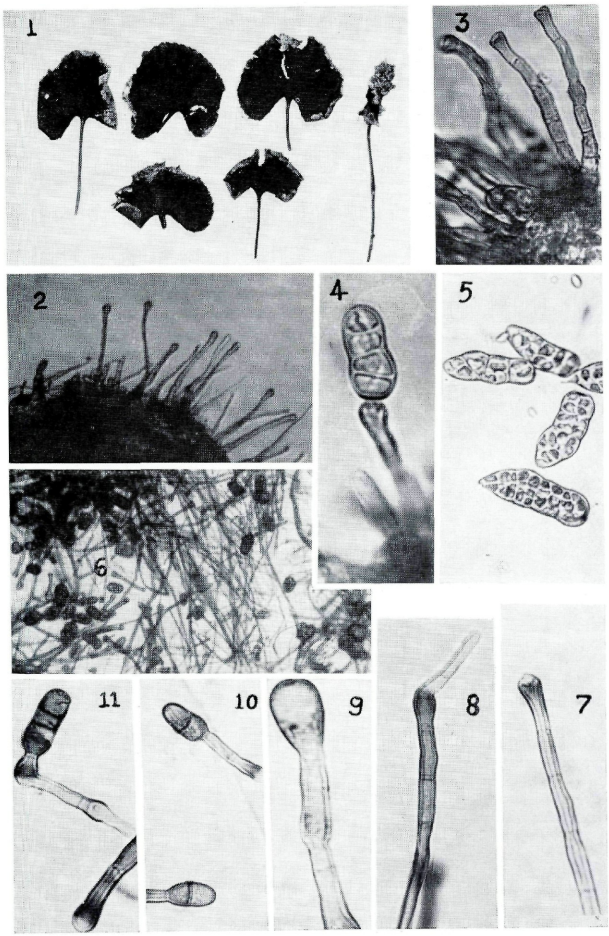
lings tip bulbous with a pore, 56—124 × 3—4.5 μ. Conidia oblong or subangular, pointed at the apex and the base flat with a scar, 2—3 median constrictions, muriform, dark brown, 33—68 × 12.5—19 μ.

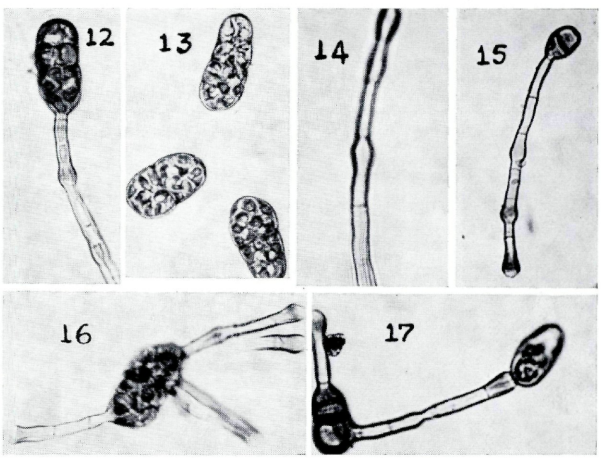
Isolation and Pathogenicity

The fungus was isolated in pure form on potato dextrose agar medium by tissue isolation method and was maintained on slants for further studies. The fungus sporulated luxuriently after a week and the medium turned to pink after 12 days. For inoculation studies, 10 days old culture was used. The pathogenicity of the fungus was successfully proved by spraying spore suspension on healthy leaves with an automizer. Typical symptoms of the disease were observed after 10 days, thus proving the true pathogenic natur of the fungus, following the method already described by Anahosur et al. (1972).

Development of conidia and conidiophores

The development pattern of the conidiophores and conidia was also studied which is important in the present system of classification of Deuteromyoetes. The fungus in culture produces characteristic conidiophores which can be easily distinguished from the mycelium (Fig. 6). The apical region of conidiophore is swollen with a circular pore at the top (Fig. 7). The conidium develops as an outgrowth of protoplasm through this pore; later it turns pale brown (Fig. 9). First a transeverse septum is laid down making the conidium 2-celled (Fig. 10). Further two more septa are laid down resulting in the production of 4-celled conidium (Fig. 11). At this stage median constrictions are visible. Subsequent septations (transeverse and longitudinal) result in the formation of muriform spores (Figs. 12, 13). When the conidium is dislodged, secondary growth of the conidiophore is directly through the terminal swollen region. The new growth is subhyaline (Fig. 8). A conidium is again produced at the apex of this secondary growht through the pore; series of 3—4 apical proliferations and terminal conidia are producted which can be recognized by the total number of nodular swellings present in the conidiophore (Figs. 14, 15). It was interesting to note that the conidiophores break-up into fragments at nodular regions (Figs. 10, 11, 15). Each of such fragments proliferates at nodular region and produces terminal conidia, thus taking over the function of conidiophores. The other interesting feature observed in this fungus was the production of secondary conidia at the apices of secondary conidiophores arising from the cells of conidia (Figs. 16, 17). This phenomenon resembles that of *Stemphylium bolicki* (Sobers and Seymour, 1963). In general, the developmental pattern of the conidia resembles to „Porosporae group", and is characteristic of the genus *Stemphylium* (Simmons, 1967, 1969).





Acknowledgement

Grateful thanks are offered to Dr. S. W. Mensinkai, Director of Instructions of this College for the encouragement and facilities.

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Explanation of Figures

1. Leaves showing the symptoms of the disease

From host

2. Conidiophores with bulbous apices
3. Enlarged view of conidiophores
4. Conidiophore with conidium at the tip
5. Conidia.

From culture

6. Culture of the fungus showing conidiophores and conidia.
7. Conidiophore with bulbons tip and pore at the top.
8. Secondary growth of the conidiophore through nodular swelling.
9. 1-celled conidium.
10. 2-celled conidia.
11. 4-celled conidia and conidiophore broken at the nodular swelling.
12. & 13. Muriform spores.
14. 3 nodular swellings
15. 3 nodular swelings and a conidium at the top. Note the broken conidiophore at the lower most nodular swelling.
16. Secondary conidiophores.
17. Secondary conidium.