RP 406

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# Basal Wilt of Black Pepper and its Control*

During the 1976 South West monsoon period (June-September), pepper seedlings and rooted cuttings in the nursery were affected by a serious rotting. The fungus associated with this disease was found to be *Sclerotium rolfsii* Sacc. In August 1976, the fungus was observed in a private garden in Nileshwar infecting an yielding vine and causing its death. This disease was subsequently observed in a few black pepper nurseries in North Kerala (Peruvannamuzhi, Chungathara and Panniyur). Chowdhury (1943) had earlier reported that *S. rolfsii* caused basal wilt disease on black pepper in Assam inflicting up to 76% losses.

In the field, infection started at the collar region as water soaked lesions, which spread both ways. The leaves of the infected seedlings became flaccid, turned yellow, and fell off. The soft decay of the collar region caused girdling of the stem and the seedlings succumbed to infection within 2-3 days. The lesion at the base of the stem was covered with white mycelium containing numerous sclerotia. The fungus grew luxuriantly on oat agar medium at room temperature (27-30°C) and formed sclerotium within seven days.

Pathogenicity was established by inoculating the seedlings at the collar region with mycelial mass containing sclerotia. Inoculated seedlings collapsed within five days. Leaves inoculated with the fungus showed water-soaked lesions and decay within 4-5 days under high humidity. The fungus was reisolated from such infected tissues.

Nine fungicides (DCMOD, methoxy ethyl mercuric chloride, DMOC, carbendazim, PCNB, benomyl, streptocycline, aureofungin

**Table I.** *Fungicidal effect on growth of mycelia*

| Sl. No. | Fungicides*/ Antibiotics | Conc ppm | Radial growth of mycelia, mm |
|---|---|---|---|
| 1. | Carbendazim | 1000 | 40 |
| | | 500 | 42 |
| | | 250 | 42 |
| | | 100 | 45 |
| | | 50 | 45 |
| 2. | PCNB | 1000 | ** |
| | | 500 | 15 |
| | | 250 | 26 |
| | | 100 | 40 |
| | | 50 | 42 |
| 3. | Benomyl | 1000 | ** |
| | | 500 | 42 |
| | | 250 | 45 |
| | | 100 | 52 |
| | | 50 | 58 |
| 4. | Streptocycline | 1000 | 62 |
| | | 500 | 68 |
| | | 250 | 68 |
| | | 100 | 68 |
| | | 50 | 69 |
| 5. | Aureofungin Sol. | 1000 | 45 |
| | | 500 | 45 |
| | | 250 | 53 |
| | | 100 | 53 |
| | | 50 | 53 |
| 6. | Agrimycin | 1000 | 60 |
| | | 500 | 68 |
| | | 250 | 70 |
| | | 100 | 75 |
| | | 50 | 75 |

*DCMOD, DMOC, and Methoxy ethyl mercuric chloride completely inhibited radial growth of mycelia, at all concentrations.

**Growth completely inhibited.

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sol, agrimycin) were screened *in vitro* and *in vivo* to find out the most effective chemical against the pathogen. Observations on the radial growth of the fungus on poisoned oats agar were recorded after 4 days (Table I). The action of different concentrations of the chemicals was studied on the sclerotia. For this, 100 mature sclerotia were added to test tubes containing 10 ml each of the chemical. Each day, 10 sclerotia were removed and their germination was recorded on OA medium (Table II). Survival of sclerotia was studied in test tubes containing 30g sterile soil drenched with 10 ml of the chemicals at varying concentrations. From 100 sclerotia buried in each tube, ten sclerotia were recovered each day and germination tested (Table II).

Among the nine chemicals tested *in vitro*, only DCMOD and methoxy ethyl mercuric chloride were effective. Though DCMOD, DMOC, and methoxy ethylmercuric chloride were fungicidal against the mycelium, at concentrations as low as 50 ppm higher doses of DCMOD and the mercurial fungicide were necessary for killing the sclerotia.

Rooted pepper cuttings were planted in polythene bags containing sterile soil. After establishment of the cuttings, chemicals like DCMOD, DMOC, and methoxy ethyl mercuric chloride were added at concentrations of 1000, 500, and 250 ppm. The cuttings were inoculated with mycelial mats containing 20 mature sclerotia each and kept in the glass house (temperature 25-30°C). Ten cuttings were used for each treatment. Two

**Table II.** *Fungicidal effect on survival of sclerotia*

| Sl. No. | Fungicides | Conc. ppm | Germination of sclerotia steeped in fungicidal solution days | | | | | | | Germination of sclerotia kept in fungicides treated soil days | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. | DCMOD | 1000 | + | + | — | — | — | — | — | + | + | + | — | — | — | — |
| | | 500 | + | + | — | — | — | — | — | + | + | + | — | — | — | — |
| | | 250 | + | + | + | — | — | — | — | + | + | + | — | — | — | — |
| | | 100 | + | + | + | + | — | — | — | + | + | + | + | — | — | — |
| | | 50 | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| 2. | Methoxy ethyl | 1000 | + | + | — | — | — | — | — | + | + | + | + | — | — | — |
| | mercuric chloride | 500 | + | + | + | — | — | — | — | + | + | + | + | — | — | — |
| | | 250 | + | + | + | — | — | — | — | + | + | + | + | + | — | — |
| | | 100 | + | + | + | + | + | — | — | + | + | + | + | + | — | — |
| | | 50 | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

*Note:* The other fungicides/antibiotics were not effective
– Growth/germination inhibited
+ Germination of sclerotia not inhibited

controls were maintained, one without any treatment and another without fungicide, but with mycelium.

DCMOD and methoxy ethyl mercuric chloride were effective in preventing the disease at all concentrations tried.

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## REFERENCES

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