Control of root and crown rot of African Violet and of Gloxinia caused by Phytophthora nicotianae var. nicotianae

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A crown and root rot of African violet *(Saintpaulia ionantha* Wendl.) and of Gloxinia *(Sinningia speciosa* Benth. & Hook.) caused by *Phytophthora nicotianae* var. *nicotianae* is reported from Canada for the first time. Control of both diseases by the systemic fungicides, Aliette (May & Baker) and Ridomil (Ciba-Geigy) is reported.

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La pourriture des racines et du collet provoquée par *Phytophthora nicotianae* var. *nicotianae* chez la violette africaine *(Saintpaulia ionantha* Benth. & Hook) et la gloxinie *(Sinningia speciosa* Wendl.) a été observée pour la premiere fois au Canada. On decrit ici une méthode de lutte contre ces deux maladies au moyen de deux fongicides endothérapiques, Aliette (May & Baker) et Ridomil (Ciba-Geigy).

Phytophthora nicotianae var. ***nicotianae*** is reported for the first time in Canada as a cause of crown rot and root rot of African violet ***(Saintpaulia ionantha*** Wendl.) and of Gloxinia ***(Sinningia speciosa*** Benth. & Hook). The leaves and petioles turned brown very rapidly, appeared water-soaked and rapidly degenerated. The plant died shortly after the first symptoms appeared.

The disease of African violet, which usually appeared when the plants were starting to flower, caused losses of 10 to 50% of the plants. Losses were lower during the summer and fall than during the winter months when humidity was high. Isolations from diseased petioles or leaves yielded a ***Phytophthora*** which was identified through the courtesy of Commonwealth Mycological Institute (C.M.I.) as ***Phytophthora nicotianae*** B. de Haan var. ***nicotianae*** mating type A2.

This was the first record of ***Phytophthora*** isolated from ***Saintpaulia*** or ***Sinningia*** in Canada although a similar disease from the former was reported from the United Kingdom (private communication, C.M.I.) caused by ***P. nicotianae*** var. ***parasitica,*** by Krober and Plate from Germany and more recently by Strider from the United States caused by the same organism.

A foliage and crown rot of Gloxinia ***(Sinningia speciosa)*** brought to our attention was also caused by ***P. nicotianae*** var. ***nicotianae,*** a culture of which mated with our original culture obtained from African violet (courtesy of Biosystematics Research Institute, National Identification Service, Ottawa). One thousand of these plants had been obtained from Florida by the grower as small transplants. When observed in December 1977 they were in 20 cm pots and just coming into flower. The grower had already lost over 400 plants and about half of the remainder were starting to show symptoms. This paper reports studies on the temperature and humidity requirements for infection and on control of the disease.

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Materials and methods

The pathogen was isolated from infected African violets and maintained on corn meal agar (CMA). Inoculum was grown for 7 days at 25°C on CMA.

To determine the optimum temperature for growth, 11 mm discs containing mycelium were placed in the middle of CMA plates and the plates were placed in incubators at 10, 15, 20 and 25°C. Growth was recorded 7 and 10 days after inoculation.

African violet plants, cultivar Marta 'Ballet series', in bud were inoculated by placing 2 to 3 11-mm CMA discs containing fungal mycelium and sporangia into the crown of the plant and enclosing the plants in plastic bags tied at the top. Dipping the plants in an aqueous spore-mycelial mixture or pouring a spore-mycelial mixture over the plant and soil proved less satisfactory. Adequate controls were used in all tests.

The plants were placed in Conviron controlled environmental chambers at 16, 18, 22, 25, 27 and 30°C programmed for 14 hours daylength, and examined periodically for symptom development.

Control was attempted using 'Aliette' [(LS 74-783) May & Baker, aluminium tris (ethyl phosphonate)] at 1600 ppm a.i. and 'Ridomil' [(Ciba-Geigy CGA 48988 DL-methyl N-(2,6-dimethyl phenyl)-N-(2-methoxyacetyl) alaninate] at 125 ppm a.i. applied to the soil at a rate of 50 ml per 10 cm pot one week prior to inoculation and at the time of inoculation.

Both materials were tested 'in vitro' at the same concentration prior to the 'in vivo' tests by incorporating 1 ml of the chemicals in the agar per 90 mm petri dish and inoculating the plate with an 11 mm agar disc containing fungal mycelium. Later, trials were conducted in the growers' greenhouses with naturally infected plants.

Results

The fungus grew most rapidly at 25°C and had completely covered the plates after 10 days growth. Infection took place at all temperatures tested but was more rapid and consistent at 25°C or above. At the higher temperatures symptoms appeared within 4 days of inoculation and the plants were dead three days later.

Aliette exhibited no activity 'in vitro' while Ridomil completely inhibited growth on the plates. Both Aliette and Ridomil applied one week prior to inoculation gave 100% control of the disease in all tests at all temperatures. When applied at the time of inoculation the results were more erratic with some of the inoculated treated plants becoming diseased. Both fungicides applied to young plants in the growers' greenhouses proved to be very effective in preventing disease development. The amount of disease present was reduced from that usually found in the greenhouse to less than 1% in both cases.

A soil application of 100 ml per pot of Ridomil, 125 ppm a.i. applied to the Gloxinia plants which were starting to show symptoms, completely checked the disease and the majority of them were saleable.

Literature cited

1. **Krober, H. and H.P. Plate.** 1973. **Phytophthora - Faule on Saintpaulien [Erreger: *Phytophthora nicotianae* var. *parasitica* (Dast.) Waterh.]. Phytopath.Z.** 76: 348-355.
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