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Short communication

Rhizoctonia solani Kühn AG 2-1 on kohlrabi in Italy

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Abstract

Rhizoctonia solani AG 2-1 was recorded in Central Italy on kohlrabi plants showing root and stem rot. After artificial inoculation the fungus caused damping-off of 7-day-old seedlings and root and stem rot of 4-month-old plants developed after 15 days of incubation. This seems to be the first record of *R. solani* AG 2-1 on kohlrabi.

A severe unusual disease of kohlrabi (*Brassica oleracea* conv. *acephala* (DC) Alef. var. *gongyloides*) was recorded during the period 1989–1992 in Latina province, in Central Italy. Kohlrabi plants showed root and stem rot, during the spring at harvest time, with losses of 20% [Stravato and Cappelli, 1994].

Explants from root samples of infected plants were cut aseptically, incubated at 26 ± 2 °C, in the dark, on PDA (Potato Dextrose Agar, Oxoid), pH 6.5. A fungus, identified as *Rhizoctonia solani* Kühn [teleomorph: *Thanatephorus cucumeris* (Frank) Donk] on the basis of its morphological characteristics and determination of multinucleate condition in vegetative hyphal cells using Giemsa staining procedure [Herr, 1979; Burpee *et al.*, 1980], was isolated from almost 80% of the explants.

Anastomosis group (AG) of *R. solani* was determined by pairing the isolate with the tester strains of AG 1-IA, AG 1-IB, AG 1-IC, AG 2-1, AG 2-2IIIB, AG 2-2IV, AG 3, AG 4, AG 5 and AG 6 [Tu *et al.*, 1969; Sneh *et al.*, 1991]. Mycelial disks (7 mm in diameter) were cut from the margins of actively growing cultures on PDA and planted 3 cm apart on microscope slides coated with 2% water agar (WA).

Fusions between isolates were observed and occurred at a low frequency only with the AG 2-1 tester strain ATCC 66154, isolated from pea from Japan; no anastomosis was observed with the other tester strains.

The best growth of *R. solani* isolated from kohlrabi was at 25 °C, the same optimum temperature being recorded for the AG 2-1 tester isolate. Appearance in culture of *R. solani* strain isolated from kohlrabi and the AG 2-1 tester isolate was similar (mycelium reddish brown, sclerotia small, rare to moderate, colour similar to mycelial colour).

Pathogenicity tests were carried out under controlled conditions (22 ± 2 °C), on plants of kohlrabi (cv Express Forcer F1); 60 plants were transplanted after 15 days in plastic boxes (30 × 25 cm) containing 5% v/v of inoculum, obtained by culturing *R. solani* at 25 °C for 14 days on a medium based on maize flour and sand [Nene *et al.*, 1981]; controls contained sterilized soil without inoculum. Healthy roots of 4-month-old plants were also inoculated; they were superfi-

cially sterilized with 95% ethanol and a wound made aseptically with a corkborer (5 mm in diameter); a mycelium disk of the same diameter was taken from a 10-day-old agar culture and placed in the wound; a disk of agar was used for control plants. *R. solani* caused damping-off of the seedlings within 7 days, while root and stem rot was observed after 15 days when plants of 4 months were inoculated.

R. solani AG 2-1 is distributed worldwide and comprises slow growing isolates that are pathogens of winter crops, forming reddish sclerotia in rings [Ogoshi, 1975]. Some pathogenic isolates of the fungus cause 'damping-off' of crucifers [Watanabe and Matsuda, 1966], 'bud rot' of strawberry [Tominaga *et al.*, 1966], 'leaf blight' of tulip [Nakatomi and Kaneko, 1971], 'root rot' of Japanese radish [Homma and Ishii, 1984] and subterranean clover [Wong *et al.*, 1985]. From the literature consulted, this seems to be the first record of *R. solani* AG 2-1 on kohlrabi.

The determination of anastomosis affinity of *R. solani* is an important taxonomic tool; furthermore it represents an useful information since anastomosis groups are almost completely genetically isolated and must be taken into account in breeding programmes and choice of rotations.

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