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Clover rot (*Sclerotinia trifoliorum*) and *Fusarium* fungi in organic red clover in Finland

Tapani Yli-Mattila^{1*}, Galina Kalko², Asko Hannukkala³, Sari Paavanen-Huhtala¹ and Kaija Hakala⁴

¹Lab. of Plant Phys. and Mol. Biol., Univ. of Turku, FI-20014 Turku, Finland

²Lab. of Microbiol. Plant Protection, All-Russia Research Institute for Plant Protection, Shosse Podbelskogo, 3, St.-Petersburg, 196608, Russia

³MTT Agrifood Research Finland, Plant Protection, FI-31600 Jokioinen, Finland

⁴MTT Agrifood Research Finland, Plant Production Research, FI-31600 Jokioinen, Finland
tymat@utu.fi

We investigated the composition of fungal isolates in red clover roots and the susceptibility of red clover cultivars to *Sclerotinia trifoliorum*, which causes the important disease clover rot. Fungi were isolated from red clover roots of two established organic fields, from a field in a transitional phase from conventional to organic and from two conventional fields. *Gliocladium* and *Trichoderma sp.* and *Rhizoctonia sp.* isolates were more common in the established organic clover fields, which had been organic for more than ten years, than in a young one which was still in the transitional phase. In the nonorganic fields with a long history of cereal growing *Fusarium avenaceum* and *F. culmorum* were more common than in organic fields. The morphological identification of some of the difficult *Fusarium*, *Alternaria* and *Sclerotinia* isolates could be confirmed by species-specific primers and by comparing their ITS (internal transcribed spacer region) sequences to known sequences, while the fingerprinting patterns of RAPD-PCR products could be used for identifying of fungal isolates and for studying the genetic variation between the isolates. Only one of the *Fusarium* isolates from healthy red clover roots tested was clearly pathogenic to germinated red clover seedlings. The success of artificial inoculation could be confirmed by comparing the fingerprinting patterns of RAPD-PCR products from the fungus from diseased seedlings to those from the isolate used for artificial inoculation.

In leaf experiments, the cultivars Jokioinen and Ilte were more susceptible to one of the *S. trifoliorum* isolates than Betty and Bjursele, while all of them were equally susceptible to two other *S. trifoliorum* isolates. In further greenhouse experiments with intact plants it was possible to slow down the development of clover rot to some extent by means of one of the biological agents tested (*Bacillus subtilis* 10-VIZR, commercial name Alirin B), and almost totally by chemical control.

Ylimäki, A. (1967). Root rot as a cause of red clover decline in leys in Finland. *Annales Agriculturae Fenniae*, 6, 1-59.

Ylimäki, A. (1969). Clover rot as a cause of poor overwintering of clover in Finland. *Journal of the Scientific Agricultural Society of Finland*, 41, 222-242.