

# Ecology and Invasion Mechanism of Leaf Spot Disease on Grapevine Caused by *Pseudocercospora vitis* in Korea

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Leaf spot caused by *Pseudocercospora vitis* (Lév.) Speg. is one of the most important diseases in grapevine growing areas in Korea and it greatly reduces yield potential as well as fruit quality. However, very few papers were reported throughout the world. Therefore, these studies were carried out to know incidence, etiology and invasion mechanism of the pathogen to the leaf spot from 2000 to 2003.

In field observations, there was a big difference in incidence of leaf spot on the commercial varieties, according to growing locations and cultivation methods. This disease started to infect generally in July and led to maximum occurrence at the later part of maturing stage. 'Campbell Early' showed very high incidences of leaf spot compare to 'Kyoho' cultivar uniformly at three different locations such as Suwon, Anseung and Cheonan. In the most severely infected field grown with 'Campbell Early' the disease incidence showed 94.5% of leaves infected. Rain-shielding cultivation with two cultivars showed lower incidence of leaf spot than in the open field cultivation.

The isolates collected from different varieties and locations were identified as *Pseudocercospora vitis* based on the morphological and cultural characteristics. Inoculation tests at room temperature were applied on both sides of leaves with different isolates of the fungus. The typical symptoms appeared in the abaxial surface leaf inoculation, but no symptoms appeared at all in adaxial surface leaf inoculation with all isolates. The average incubation period was nine days because all symptoms appeared from 8 to 10 days after inoculation.

In order to know the mechanism of invasion of grape vine to *P. vitis*, two cultivars having different degree of resistance were compared by observing the behavior of penetration hyphae through stomata. In susceptible cultivar Campbell Early, the fungus penetrated readily into stomata after inoculation. However, in resistant cultivar Kyoho the fungus seemed not recognize the site of stomata and pass over or surrounded only the guard cell. Therefore, the fungus was not able to penetrate the resistant cultivar Kyoho. In comparison of height of guard

cells of stomata between susceptible and resistant cultivars, significant differences were observed by scanning electron microscope and light microscope. The height of guard cells of Campbell Early showed a little higher than those of Kyoho known to be resistant to the fungus. In comparison of sugar content in the fruits from same fields diseased with different levels of infection there was 20% sugar content difference between in the low infection trees group and the high infection trees group. There were also remarkably different features in both fields in terms of number of leaves, nodes, size and diameter of internode and leaf area.