

### Respiration Pattern of Lemon Fruit Infected with *Phytophthora citrophthora*

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#### ABSTRACT

The respiratory rate was higher in lemon fruit infected with *Phytophthora citrophthora* than in uninfected fruit, reaching a maximum (51 to 69 mg CO<sub>2</sub>/kg per hr) 2 days after the initial appearance of decay lesions, and thereafter decreasing until the fruit was decayed completely. In uninfected fruit, the respiration was low (5 to 6 mg CO<sub>2</sub>/kg per hr) and constant.

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*Additional key words:* *Citrus limon*.

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Respiration is an important indicator of physiological state, and generally has been found to proceed at a more rapid rate in diseased than in healthy plant organs. Published investigations on respiration of infected organs were carried out mainly on leaves or other plant parts, but only a few studies

have been made on citrus fruit. In infected citrus fruit, an increase in respiratory activity was found by Eaks (3) for lemons artificially infected with *Penicillium digitatum*, and by Vines et al. (5) for lemons and oranges naturally infected with *Penicillium digitatum*, *Diplodia natalensis*, and *Phomopsis citri*. We report the results of studies of the respiration rate of lemons artificially infected with *Phytophthora citrophthora* (Sm. & Sm.) Leonian.

Fruit of lemons (*Citrus limon* [L.] Burm. 'Eureka'), of uniform size and yellow-green color, were selected at harvests. One lot of fruit was infected by immersion in a spore suspension of *P. citrophthora*; the other lot served as a control. The spores were obtained and the density of the sporangia suspension determined according to the method previously described (4). Respiration of fruit was measured at 20 C from the day of infection until complete decay by the method of Biale (1) and Biale & Shepherd (2). All experiments were carried out in triplicate.

The respiration rate of infected lemons was higher than in the controls 1 day after inoculation, and reached a maximum of 51 to 69 mg CO<sub>2</sub>/kg per hr 5 to 6 days after inoculation, 1 to 2 days after the initial appearance of lesions. As rotting progressed, respiration decreased to 24 to 33 mg CO<sub>2</sub>/kg per hr after 10 days, when the fruit was completely decayed. In the uninfected control fruit, respiration was low (5 to 6 mg CO<sub>2</sub>/kg per hr) and constant for the entire 10-day period of the experiment (Fig. 1).

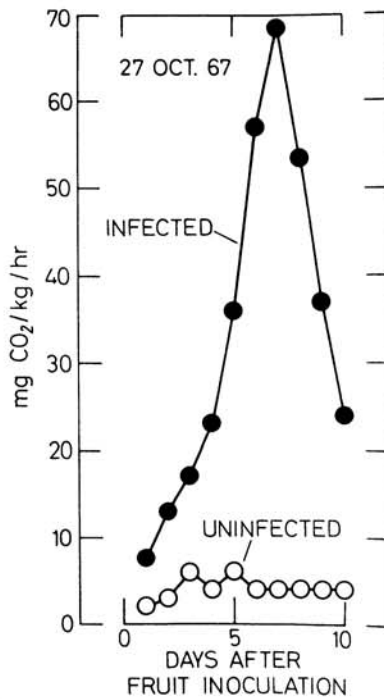


Fig. 1. Respiration rate of lemon fruit infected with *Phytophthora citrophthora*.

For lemons infected with *P. digitatum*, Eaks (3) found maximum respiration rates about four times higher than those found in this study with *P. citrophthora*. The high respiration of *P. digitatum*-infected lemons may be related to the production of ethylene by lemons infected with this fungus, as found by Biale & Shepherd (2).

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