Book review

W. H. van Eck: Formation and lysis of chlamydospores of *Fusarium solani* in soil. Doctorate's thesis Univ. Utrecht (Phytopathological Laboratory 'Willie Commelin Scholten', Baarn), 1977.

This thesis consists of a general introduction and a summary in Dutch (7 pp.), and five articles:

1) Ultrastructure of developing chlamydospores of *Fusarium solani* f. *cucurbitae* in vitro (W. H. van Eck and B. Schippers). Soil Biol. Biochem. 8 (1976): 1–6.
2) Suitability of membrane-filter techniques to study the ultrastructure of *Fusarium solani* in soil. Can. J. Microbiol. 22 (1976): 1628–1633.
3) Ultrastructure of forming and dormant chlamydospores of *Fusarium solani* in soil. Can. J. Microbiol. 22 (1976): 1634–1642.
4) Chemical data on cell walls of *Fusarium solani* in relation to resistance of spores to microbial lysis in soil. Soil Biol. Biochem. (in press, 1977).
5) Lysis of chlamydospores of *Fusarium solani* f. sp. *cucurbitae* in chitin and laminarin amended soils. Soil Biol. Biochem. (in press, 1977).

From other investigations it is known that the lysis of chlamydospores limits the survival of several *Fusarium* pathogens in the soil. In this study ultrastructural changes during this process were investigated to learn more about lytic mechanisms.

During the transformation of macroconidia into chlamydospores in f.sp. *cucurbitae* in shaken cultures, the outermost conidial wall layers are sloughed off and a new chlamydospore wall is formed; this process is similar to that which occurs in the soil (1). Macroconidia of three formae speciales were buried in soil between two Nuclepore membrane filters and recovered at intervals after 2.5–7.5 weeks (2). Some of the chlamydospores formed showed the start of lysis, observed with scanning and transmission electron microscopy; those of f.sp. *cucurbitae* contained little lipid reserve; those of f.sp. *phaseoli* and f.sp. *pisi* much more (3). Glucose, glucosamine and protein are the major constituents of conidial and chlamydospore cell walls in f.sp. *cucurbitae*. Most of the wall layers in both conidia and chlamydospores can be degraded by exo-β-1,3-glucanase leaving the outermost electron-dense portion of the newly formed chlamydospore wall; chitinase alone dissolves most of the septa between the chlamydospore cells (4). The addition of chitin and laminarin to soil enhances the lysis of chlamydospores in f.sp. *cucurbitae*. Lysis is visible in the cytoplasm before the cell walls are attacked by micro-organisms and before the fat reserve is consumed. Van Eck has thus shown convincingly that it is mainly autolysis that involves the degeneration of the lysosome membranes; it can be brought about by toxic compounds or a deficiency of energy sources or lysosomal constituents (5).

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