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The use of thiophanate-methyl for distinguishing between the two Phoma varieties causing gangrene of potatoes

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Two similar *Phoma*-like fungi are responsible for dry rot of potatoes, known as gangrene. One of them, the ubiquitous *Phoma exigua* Desm. var. *exigua*, occurs on various plant species (Boerema and Höweler, 1967). The other one can be characterized as a specific, more pathogenic fungus of potato and is nomenclaturally distinguished as *Phoma exigua* var. *foveata* (Foister) Boerema (1967).

Both fungi are morphologically indistinguishable but *P. exigua* var. *foveata* can be separated by its production of anthraquinone pigments (Bick and Rhee, 1966) which in vitro cause a yellow to reddish brown discoloration of the agar medium. In old cultures these pigments form yellow crystals.

While searching for a selective medium for the isolation of the two *P. exigua* varieties from soil, a pronounced effect of the fungicide thiophanate-methyl (Topsin-M, NF 44) on the crystallization process of the anthraquinone pigments was noticed. Addition of 25 ppm thiophanate-methyl to molten malt agar (1 % Oxoid malt extract) after cooling to 50°C not only accelerated the formation of the yellow crystals but also increased their abundance, thus producing a striking difference between the colonies of the two *P. exigua* varieties within one week (Plate 2 and 4).

If the new medium was used in dilution plates of natural soils, inoculated with *P. exigua* var. *foveata*, colonies of the fungus could be distinguished easily from the back-ground mycoflora.

Samenvatting

Het gebruik van thiophanaat-methyl ter onderscheiding van de twee Phoma variëteiten die gangreen bij aardappelen veroorzaken

Phoma exigua var. *foveata*, die morfologisch niet verschilt van *Phoma exigua* var. *exigua*, vormt anthrachinon pigmenten die in vitro een geel- tot roodbruine verkleuring van de agar veroorzaken. In oude schalen vormen deze pigmenten gele kristallen.

Toevoeging van 25 dpm thiophanaat-methyl aan moutagar stimuleert de vorming van deze gele kristallen, waardoor *P. exigua* var. *foveata* reeds in een zeer vroeg stadium te onderscheiden is van *P. exigua* var. *exigua* (Plaat 2 en 4).

References

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Boerema, G. H. & Höweler, L. H., 1967. *Phoma exigua* Desm. and its varieties. Persoonia 5: 15–28.

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Plate 1–2. *Phoma exigua* var. *foveata*. Plate 1: culture on malt agar, 10 days old. Plate 2: culture on malt agar with 25 ppm thiophanate-methyl, 10 days old.
Plate 3–4. *Phoma exigua* var. *exigua*. Plate 3: culture on malt agar, 10 days old. Plate 4: culture on malt agar with 25 ppm thiophanate-methyl, 10 days old.
Plate 5–6. *Phoma exigua* var. *foveata*. Plate 5: culture on malt agar with 25 ppm thiophanate-methyl, 6 weeks old. Plate 6: colonies in soil plate, 10 days old.
Plaat 1–2. Phoma exigua var. foveata. Plaat 1.: cultuur op moutagar, 10 dagen oud. Plaat 2: cultuur op moutagar met 25 dpm thiophanaat-methyl, 10 dagen oud.
Plaat 3–4. Phoma exigua var. exigua. Plaat 3: cultuur op moutagar, 10 dagen oud. Plaat 4: cultuur op moutagar met 25 dpm thiophanaat-methyl, 10 dagen oud.
Plaat 5–6. Phoma exigua var. foveata. Plaat 5: cultuur op moutagar met 25 dpm thiophanaat-methyl, 6 weken oud. Plaat 6: kolonies in grondplaat, 10 dagen oud.

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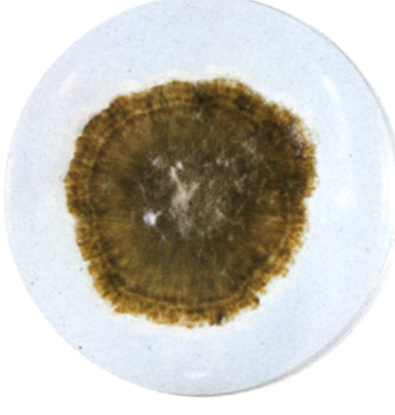

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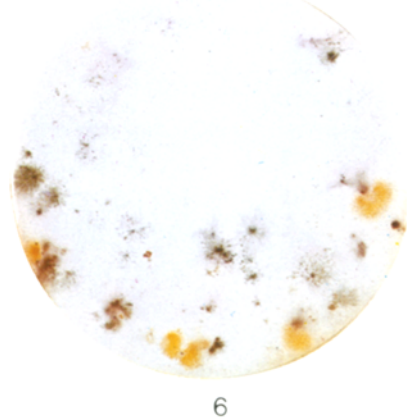

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