

## Strain variation in *Phoma lingam*, the incitant of blackleg of oilseed rape

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*Phoma lingam* is the incitant of blackleg disease or stem canker of oilseed rape. Different strains can be isolated from oilseed rape or cruciferous weeds. Investigations on the diversity of *Phoma lingam* populations were initiated by the blackleg scientific community. In this framework, we studied strain variation among isolates of a collection from the "International Blackleg of Crucifers Network" (IBCN). On the basis of different approaches, isolates can be assigned to two major groups that differ in a number of traits. One main difference is aggressiveness on oilseed rape. Severity of disease symptoms on cotyledons, true leaves and stems varies significantly. Therefore, groups were designated aggressive (A) and non-aggressive (NA). There are other terms in use relying on differences on these or other characters. NA isolates produce pigments in liquid culture (PIG<sup>+</sup>) and radial growth is faster on specific media compared to A-isolates. The latter produce host unspecific toxins belonging to the family of epipolythiodioxo piperazines (SIRO<sup>+</sup>, producing strains were also termed TOX<sup>+</sup>). Likewise, these groups can be distinguished by molecular methods. Isoenzyme (pektinase, malate dehydrogenase, glucose phosphate isomerase) studies report that these groups are distinct and a higher degree of polymorphism is found within NA-Isolates. Furthermore a number of genetic approaches confirm these results. Polymorphisms were detected on the chromosomal level and by RFLP-, RAPD-, and ITS-RFLP studies. We contributed to these studies using PCR-fingerprint techniques (VNTR-, ERIC-PCR) resulting in nine different genotypes called A, NA1, NA2, NA3, NA-AUS, Thlaspi, Sisymbrium, Erysimum and Lepidium. The results suggest that *Phoma lingam* is a species complex. Recent research by our group and others indicated that also differences in the morphology of pseudothecia can be detected. This led to the description of a new *species novum* *Leptosphaeria biglobosum*, which has now to be accepted by the Committee for Fungi at the International Botanical Congress. *Leptosphaeria maculans* is so far the term *nomen holomorphosis* of *Phoma lingam* and should now be regarded as the teleomorph of A-isolates, whereas *L. biglobosum* is the perfect stage of NA1-isolates. Further results relying on molecular data and our own mating type studies suggest that also NA2-isolates belong to a different fertility group that may lead to a third species within this complex.