P 3: Resistance evaluation of parsley populations (*Petroselinum crispum*) for resistance to Septoria leaf spot (*Septoria petroselini*)

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Abstract

Septoria petroselini, the causal agent of Septoria leaf blight (SLB), causes economically significant yield losses in parsley. Due to fungicide resistance and the very low number of currently labeled fungicides, growing of SLB resistant cultivars is the most cost effective and environmentally friendly way to avoid losses. Therefore aims of this study are the characterization of virulence patterns of different *Septoria petroselini* isolates and the evaluation of parsley populations for resistance to *Septoria petroselini*.

In order to study virulence patterns isolates of pathogen have been collected from different locations in Germany. Phenotyping of parsley populations was conducted 2015 under controlled conditions in climate chamber (20 °C, 16 h light and 95 % air humidity) in order to characterize isolates. Genotypes were inoculated in order to calculate the area under the disease progress curve. Two resistant parsley genotypes and two susceptible were then inoculated with four isolates (ES 1, ES 3, ES 6, ES 14).

The average percentage leaf area diseased ranged significantly different from 9 % to 35 % between isolates / genotypes. The most aggressive isolate with regard to the infected leaf area was used further for the inoculation of 17 presumably resistant parsley breeding populations. Disease severity was, in a first step, estimated by scoring the percentage leaf area diseased 21 days post-inoculation (dpi). Leaf symptoms ranged between 1.7 % and 46.7 % (infected leaf area) between the accessions and within the populations. As one result, reduced percentage of infection with a delayed macroscopic visible infestation and reduced disease severity could be detected in 7 of these genotypes. In a next step, additionally to the visual quantification of the infection process, PTA-ELISA using the intracellular fluid from plants to detect fungi proteins has been performed. Using this sensitive approach the rate of pathogen proteins into the plant could be measured 3dpi and 21dpi. Using PTA-ELISA 3dpi serologically no pathogen could be detected whereas a positive correlation 21dpi between the results of PTA-ELISA (measured absorbance at 405 nm) and degree of infestation could be observed (rs = 0.94). Using the quantification of pathogen protein resistant parsley cultivars could be identified 21dpi so that the method is usable for an accelerated breeding process. This study is the basis for breeding new resistant parsley varieties and the detection of *Septoria petroselini*.