

### ***Alternaria causing early blight in Denmark is comprised primarily of Alternaria solani***

We have sampled over 100 potato leaves, showing typical early blight symptoms, from the potato-growing areas in Denmark. Typical early blight symptoms **are** shown in Figure 1. The *Alternaria* fungus associated with each disease-leaf sample was isolated, and DNA was extracted from **70 of the** isolated samples. Three different regions in the DNA were amplified to identify the *Alternaria* species (Table 1).

Table 1: Primers used for amplification of the different DNA-regions.

DNA region	Forward primers	Reverse primers
glyceradehyde-3-phosphatedehydrogenase (gdp)	Forward-5'-CAA CGG CTT CGG TCG CAT TG-3'	5'-GCC AAG CAG TTG GTT GTG C-3'
Internal transcribed spacer (ITS)	5' TCC GTA GGT GAA CCT GCG G 3'	5' GCT GCG TTC TTC ATC GAT GC 3'
Alt a 1 allergen (Alt a 1)	5' – ATGCAGTTCACCACCATCGC – 3'	5' - ACGAGGGTGAY GTAGGCGTC - 3'
translation elongation factor 1- (EF-1)	5'- CATCGAGAAGTTCGAGAAGG - 3'	5'- TACTTGAAGGAACCCTTACC- 3'



Figure 1. Typical early blight symptoms, characterized by dark concentric rings.

#### **Key findings**

1. Out of the analyzed samples (n = 60), *Alternaria solani* constituted 95%.
2. The small-spored *Alternaria* species like *A. infectoria* and a broader group of small-spored *Alternaria* species, collectively referred to as *Alternaria* sp., together constituted 5% of the analyzed samples.
3. Overall, the results show that early blight in Denmark is primarily caused by *A. solani*.

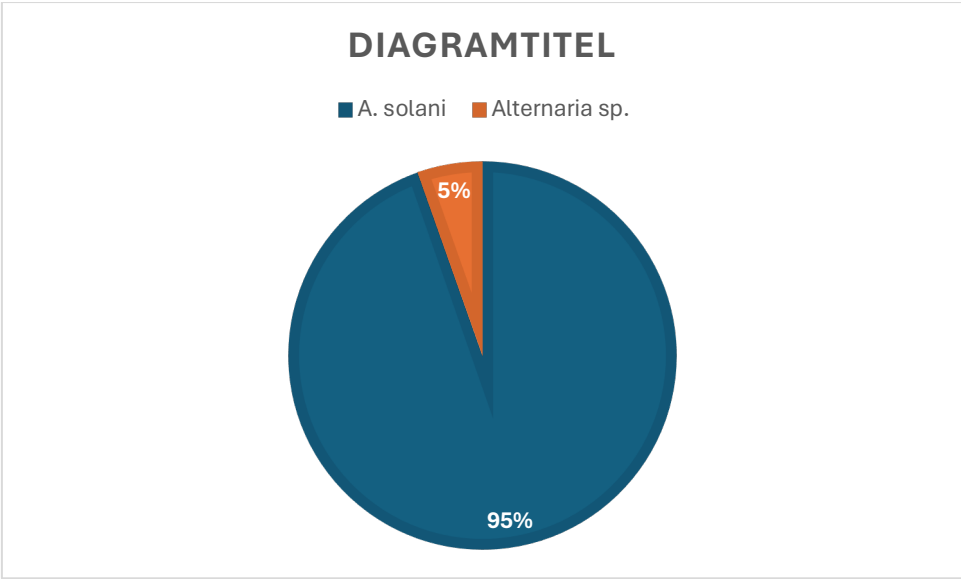


Figure 2. The proportion of Alternaria species from early blight lesions (n = 60) in Denmark.