Phenotypic characteristics of Belgian populations of *Phytophthora infestans* (2005-2010)

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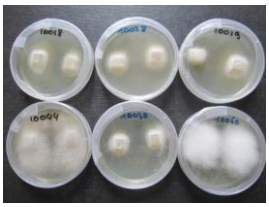
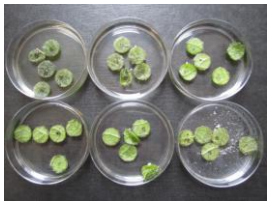
Summary

A total of 216 isolates of *Phytophthora infestans* were collected in the South part of Belgium (Wallonia) in several potato fields, volunteers and dumps during 2005-2010. Most of isolates were tested for several phenotypic characteristics, such mating type, virulence and sensitivity to metalaxyl. 55% of the Belgian isolates were A2 mating type. All 11 virulence factors were found among the tested isolates. 86% of the A2 isolates are resistant to metalaxyl and 94% of the A1 isolates are sensitive to metalaxyl. A2 isolates have more complex virulence profiles than A1.



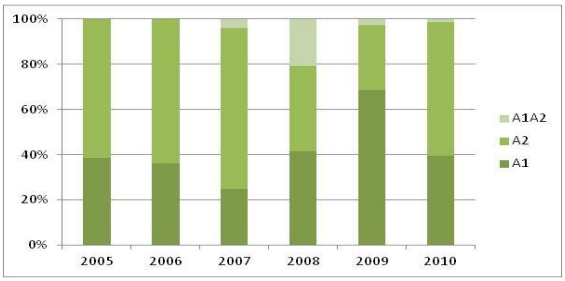


Materials and Methods

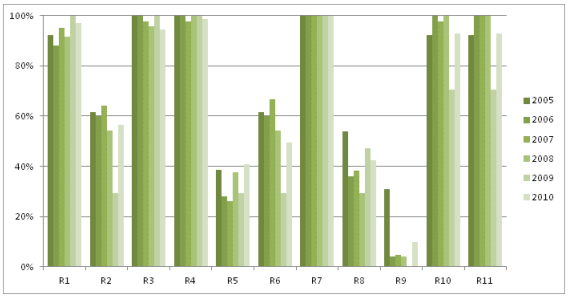
- The **mating type** was tested by growing isolates on rye agar with the known references strains of the A1 and A2 mating types. After 7-14 days incubation at 16°C, the presence or absence of oospores was recorded under a microscope
- **Virulence** pattern were determined using Black's differential set of potato clones, each having one of the R1-R11 pathotype-specific resistance genes.
- The floating potato leafdisc method (Cooke) was used to determine **metalaxyl sensitivity**. Isolates were tested on 0.1, 1, 10 and 100 mg metalaxyl/ml. Isolates sporulating on water containing 10 and 100 mg/ml were rated as resistant, those on 1 mg/ml were rated as moderately resistant and those that sporulated only on water and 0.1 mg/ml were rated as sensitive.

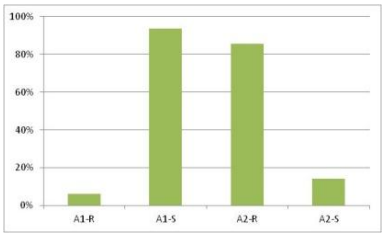
Results

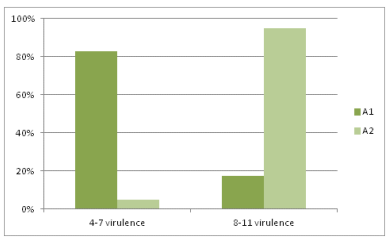
Among the 215 tested isolates, 55% were A2 mating type, 41% were A1 mating type and 4% were self-fertile. From 2005 to 2010, A2 mating type were predominant except in 2009 where 60% of strains were A1.



All known virulence factors were found among tested isolates. Virulence against R7 was found in 100% of isolates. Virulence factors corresponding to genes R1, R3, R4, R10 and R11 were found in more than 90%. Virulence factors against R2, R5, R6 and R8 were found in between 30 to 60%. Virulence for R9 was rare, up to 10% of tested isolates with exception of R9 in 2005 (31%). The most frequence race were 1-3-4-7-10-11 (19%), avirulent to R9 (13%) and 1-2-3-4-6-7-10-11 (13%).







In total, 202 isolates were screened for resistance to metalaxyl. During the 6 years, 52% were resistant, 4 % were moderately resistant and 44% were sensitive to metalaxyl. The association between metalaxyl resistance and mating type were significant. Of the A2 mating type strains, 85% were resistant and of the A1 mating type, 94% were sensitive.

A2 isolates have more complex virulence profiles than A1. Among 199 tested isolates, 83% of the A1 strains have 4 to 7 virulences and 95% of the A2 strains have 8 to 11 virulences.

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