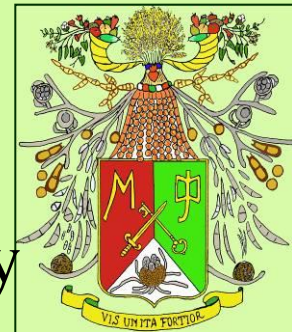




All-Russian Institute of Plant Protection
(VIZR)

Laboratory of mycology and phytopathology



ALTERNARIA SPECIES ON POTATO IN RUSSIA

Orina A.S., Gannibal Ph.B., Levitin M.M.

EuroBlight Workshop

9-12 October, 2011

Symptoms of early blight on potato leaves



Disease occurs throughout the potato growing zone.
Yield losses reach up to 50%.

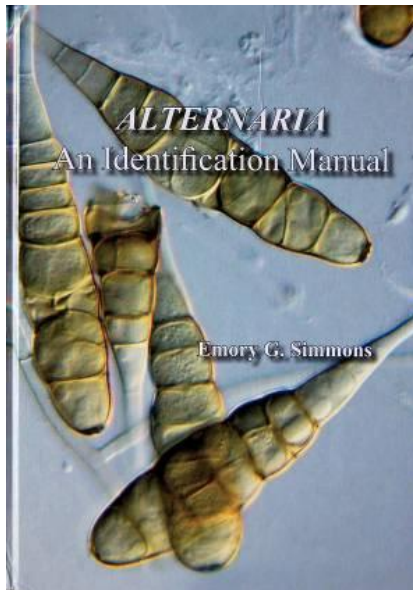
Causing agents of early blight of potato

Frequently mentioned

A. solani
A. alternata

Modern taxonomy

A. tenuissima
A. arborescens
A. alternata
A. solani



Alternaria.
An identification manual

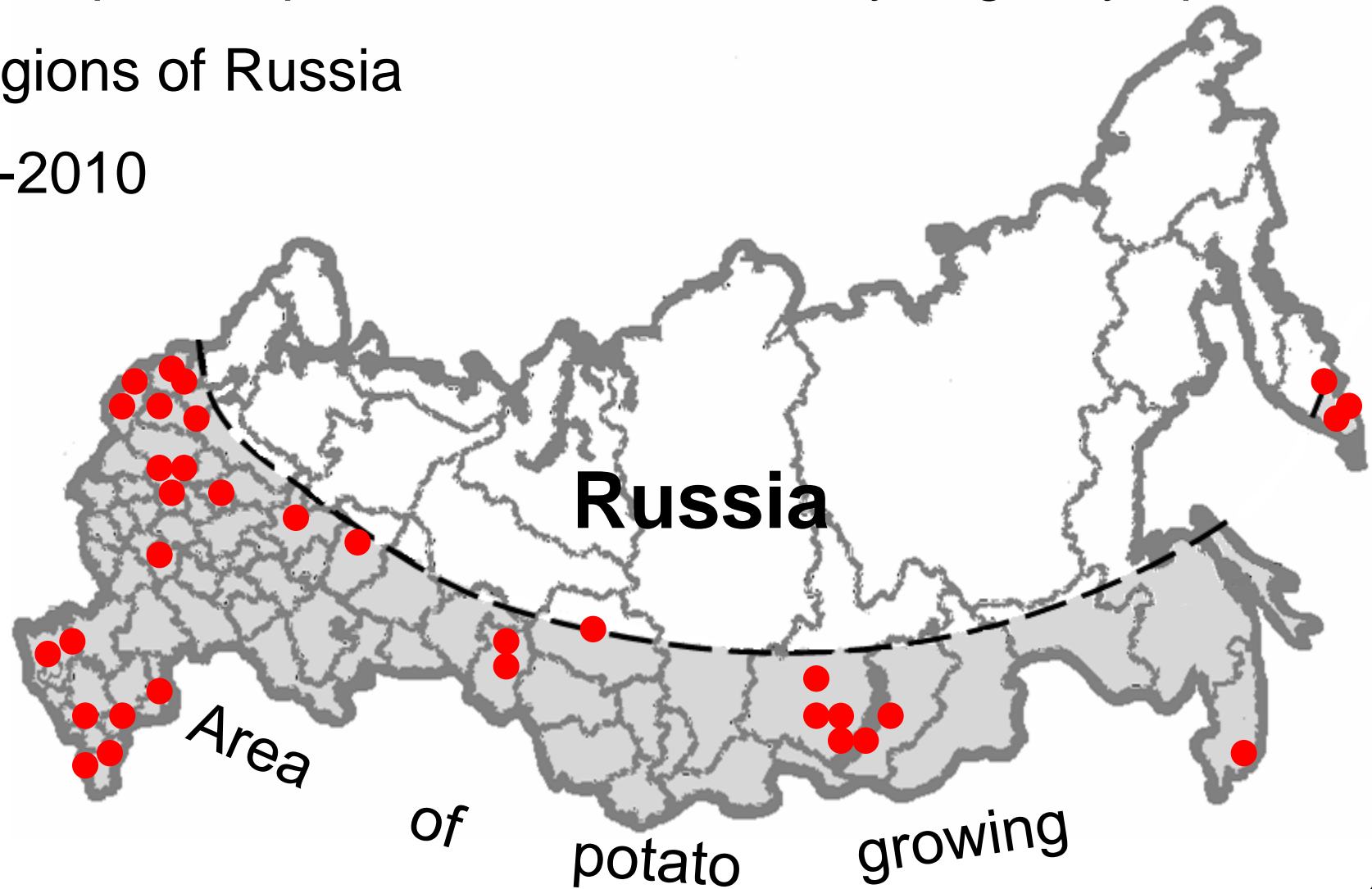
E. Simmons, 2007

Sampling

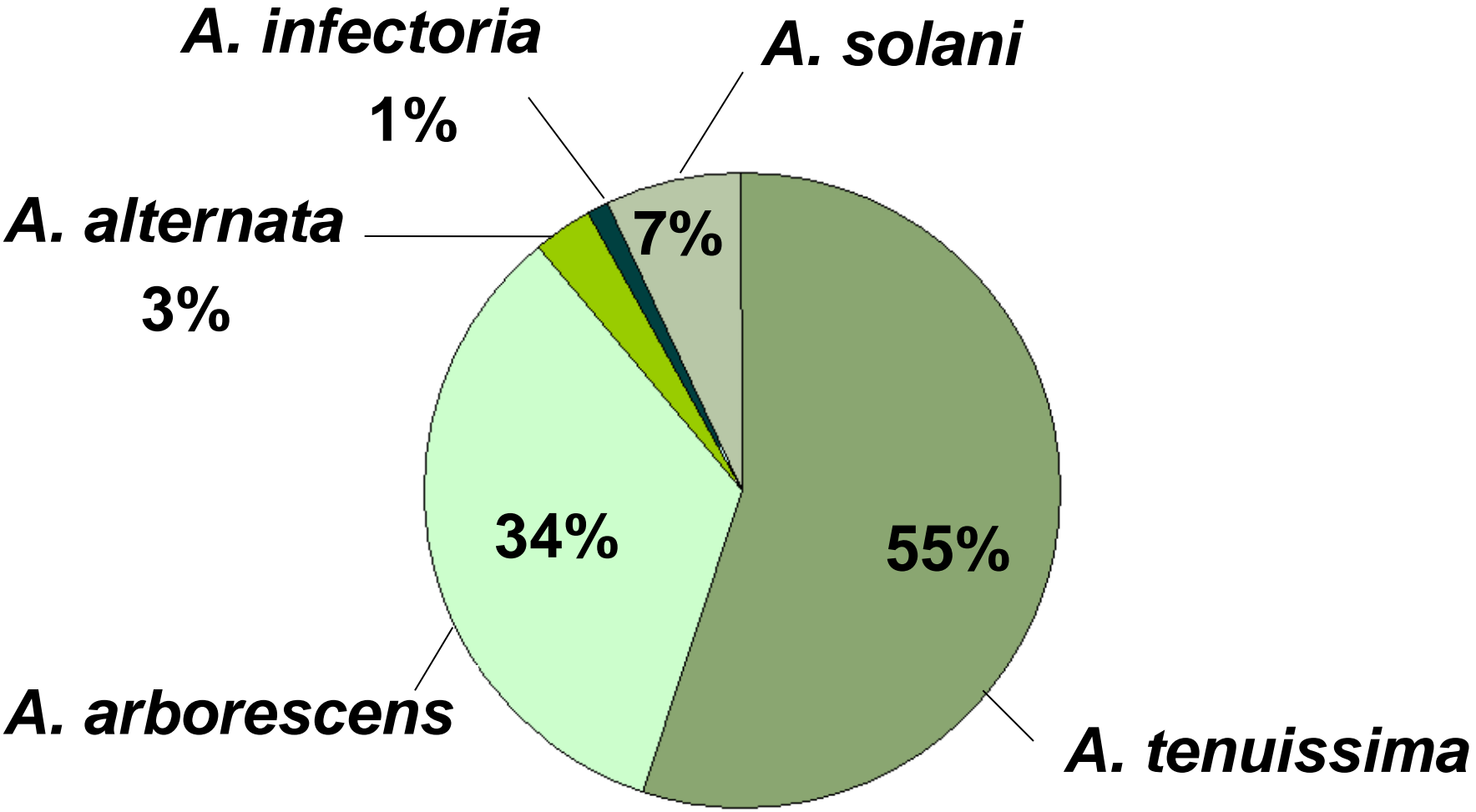
133 samples of potato leaves with early blight symptoms

19 regions of Russia

2009-2010

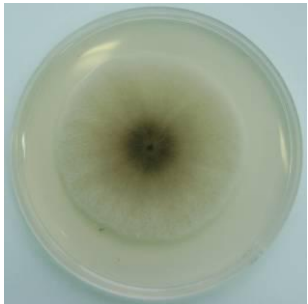


Diversity of *Alternaria* species from potato samples collected in 2008-2010

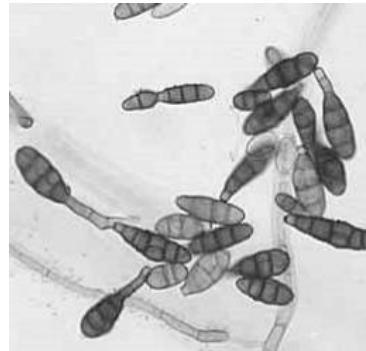


Morphology of small-spored *Alternaria* species causing early blight of potato

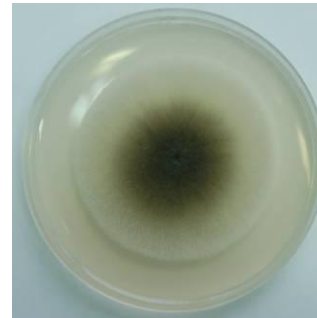
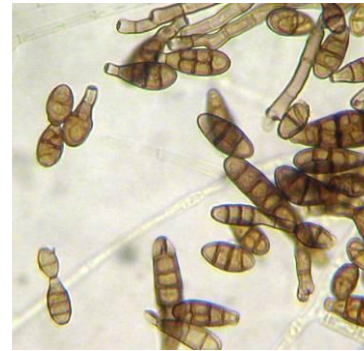
A. tenuissima



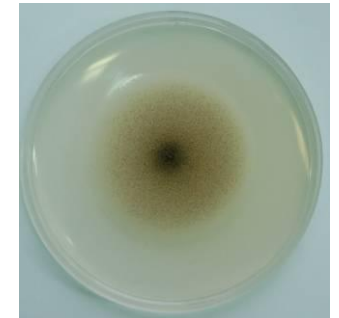
A. arborescens



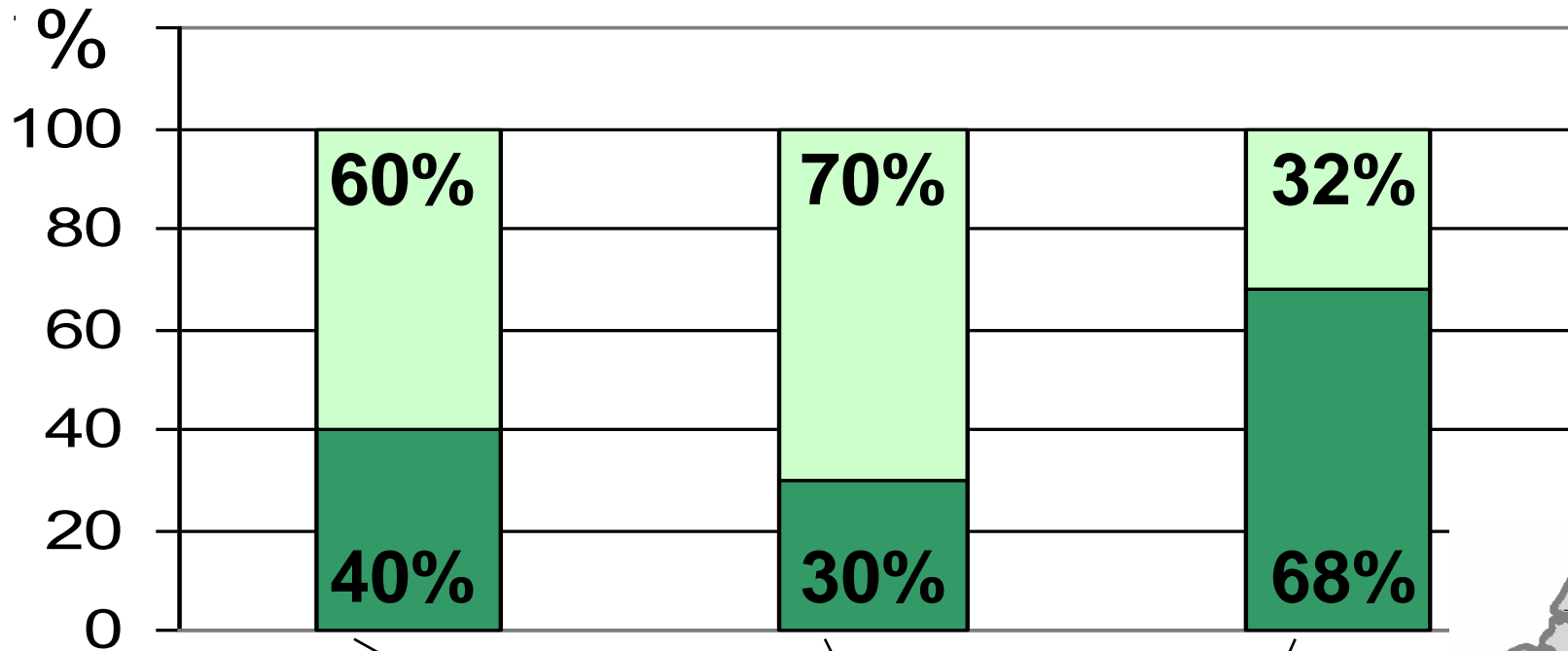
A. alternata



A. infectoria



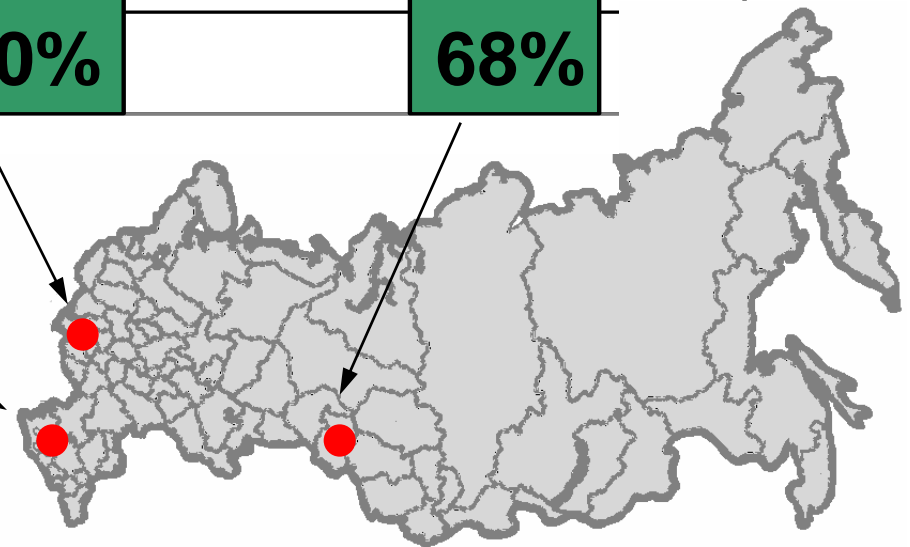
Ratio of *A. tenuissima* and *A. arborescens* occurrence on potato in different regions of Russia



A. tenuissima



A. arborescens



Morphology of *Alternaria solani*

Colonies on different media

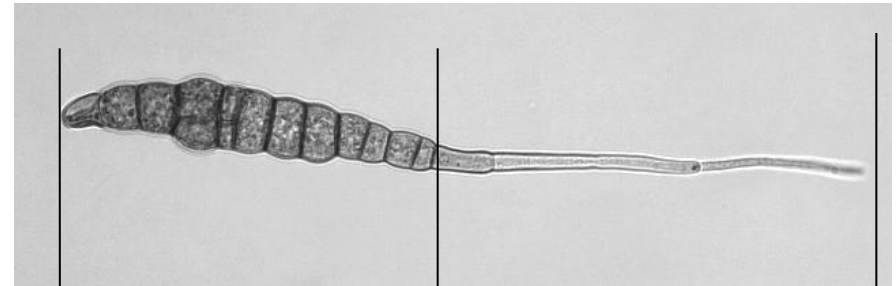


V4



YES

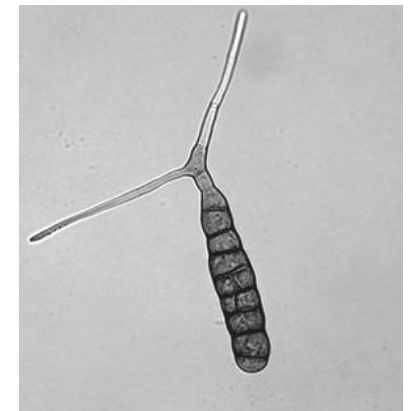
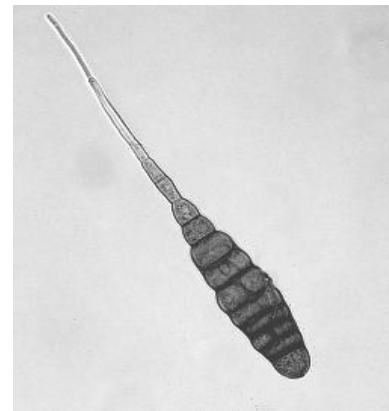
Conidia size



59-104

98-200

162-279, μm



Differentiation of large-spored *Alternaria* isolates using molecular methods

Methods:

UP-PCR

with primers
L45, 15/19, AS4 and
AS15inv

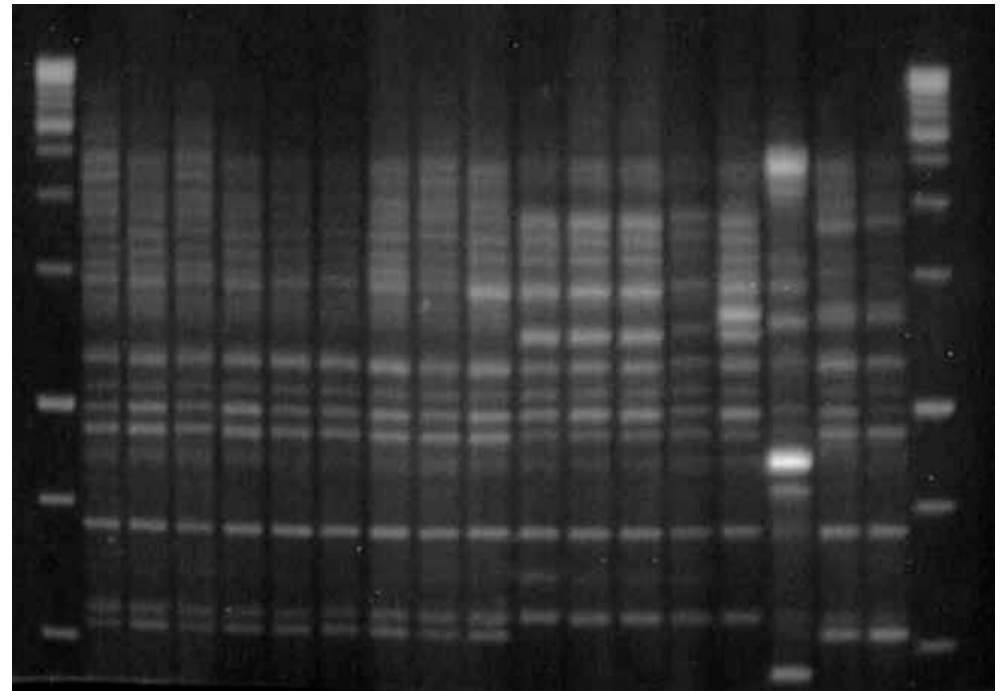
RAPD

with primer A10

Analysis:

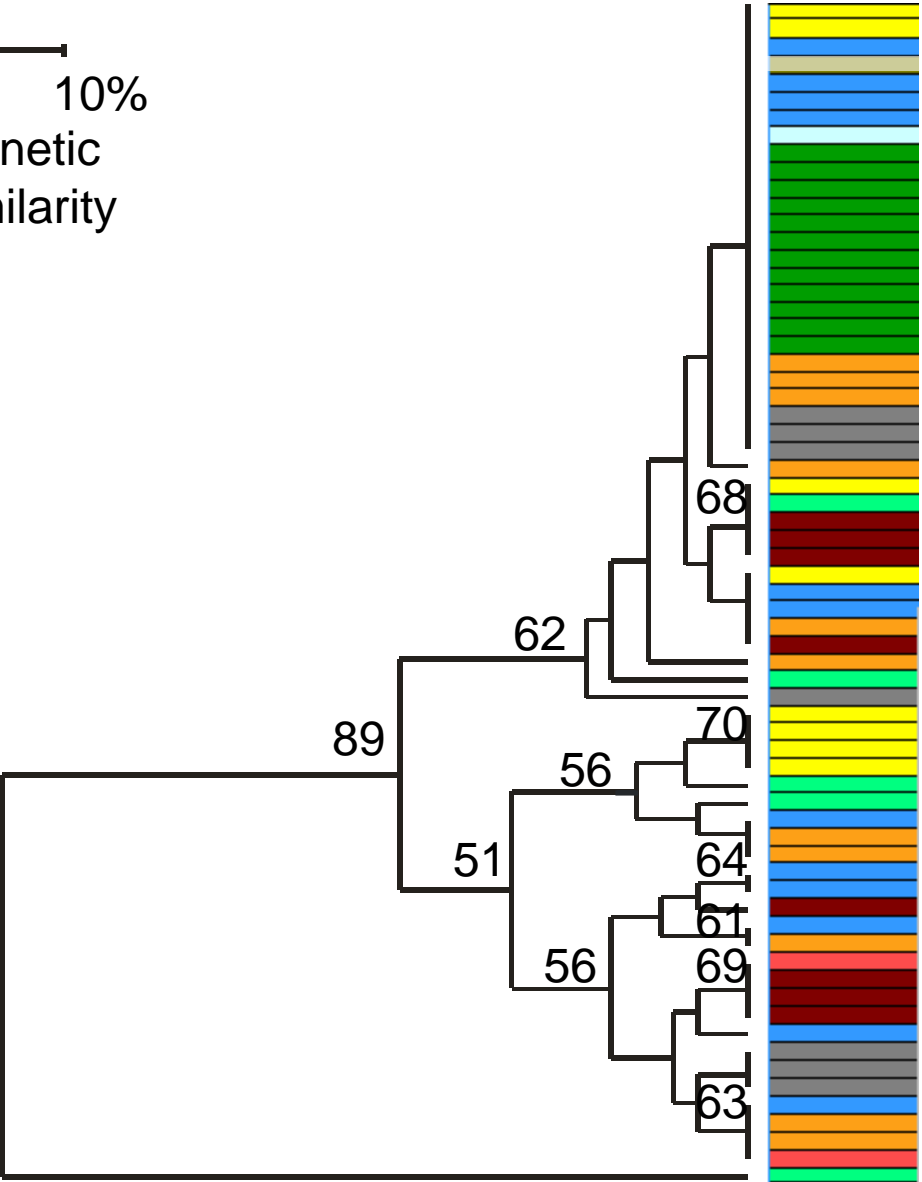
UPGMA using Treecon 3.1b

UP-PCR profile with primer AS4

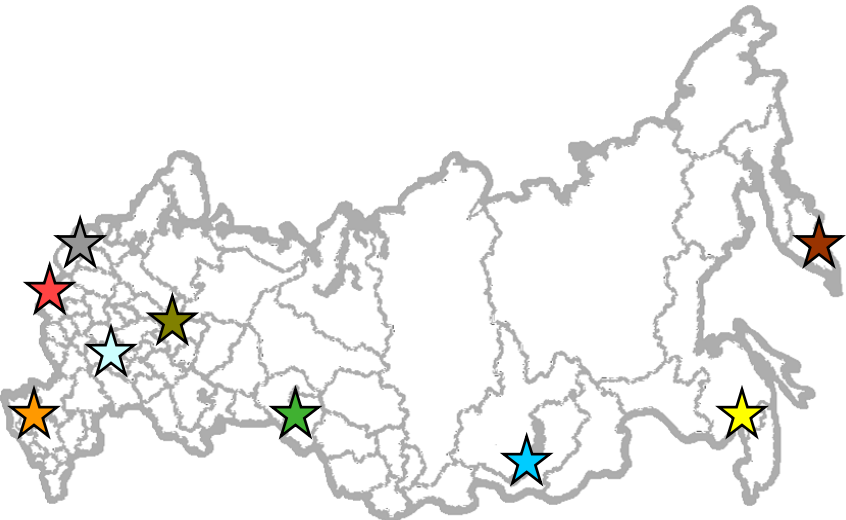


Genetic similarity of isolates of different geographic origin

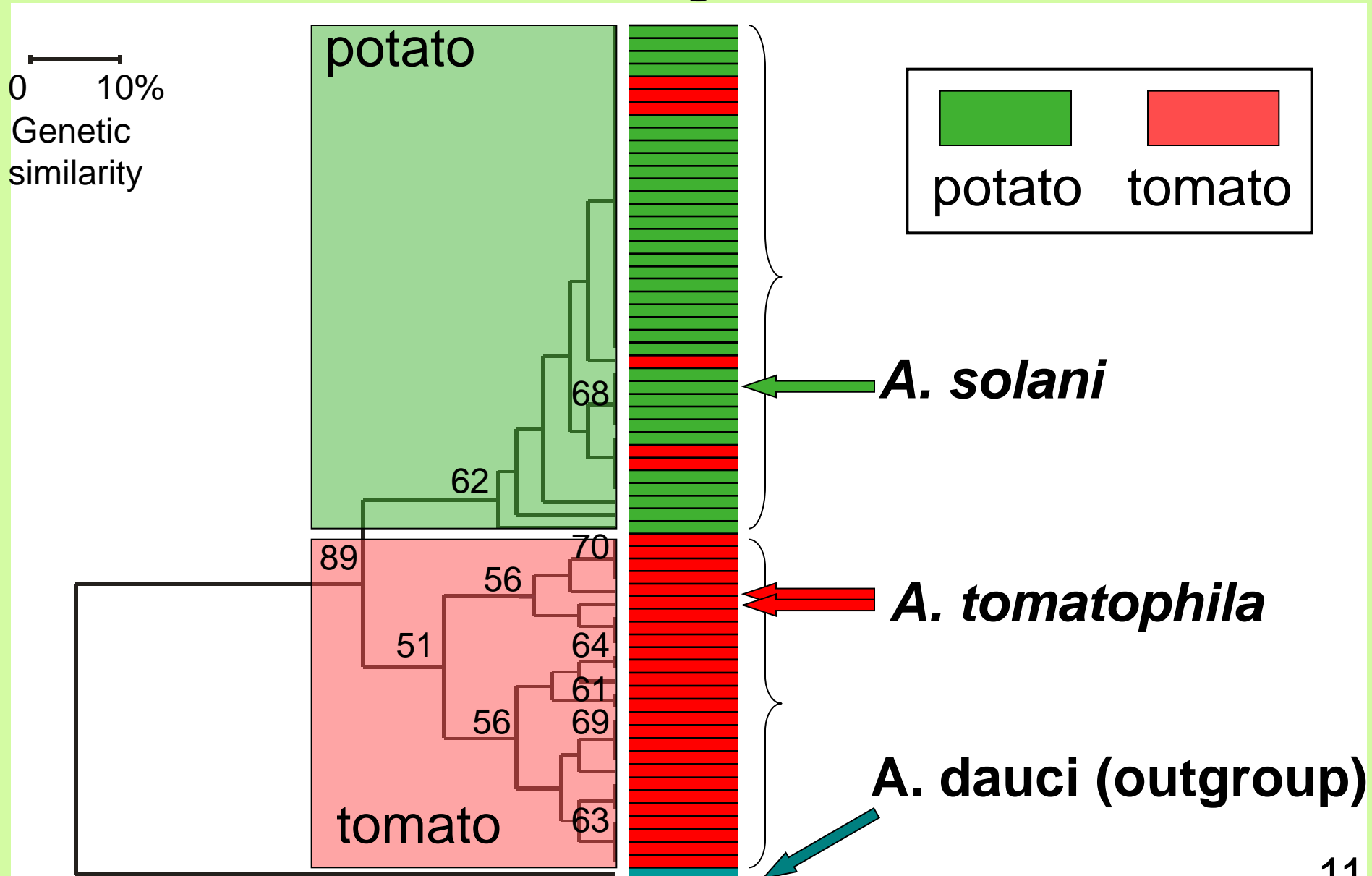
0 10%
Genetic similarity



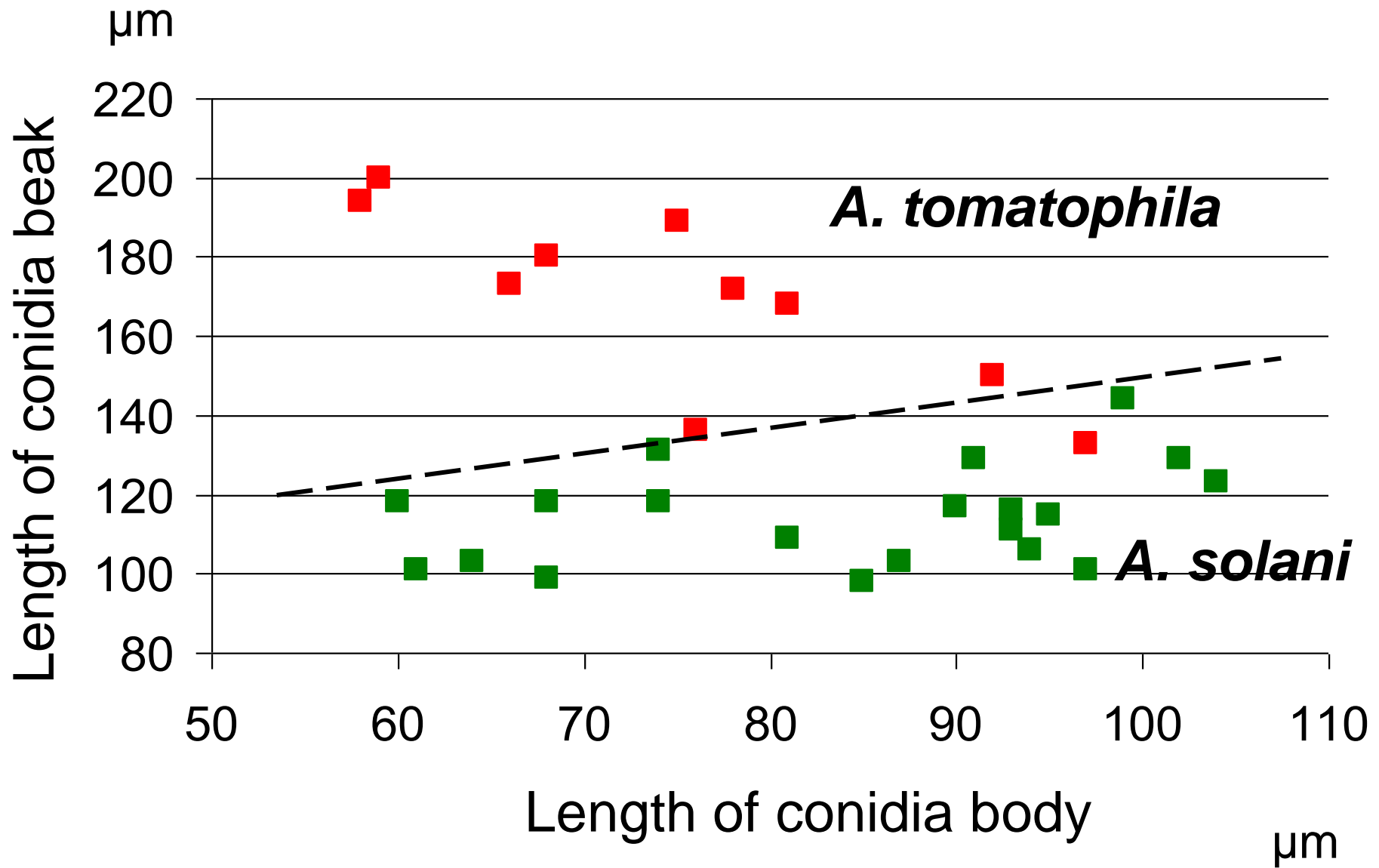
Geographic origin



Genetic similarity of isolates of different host plant origin

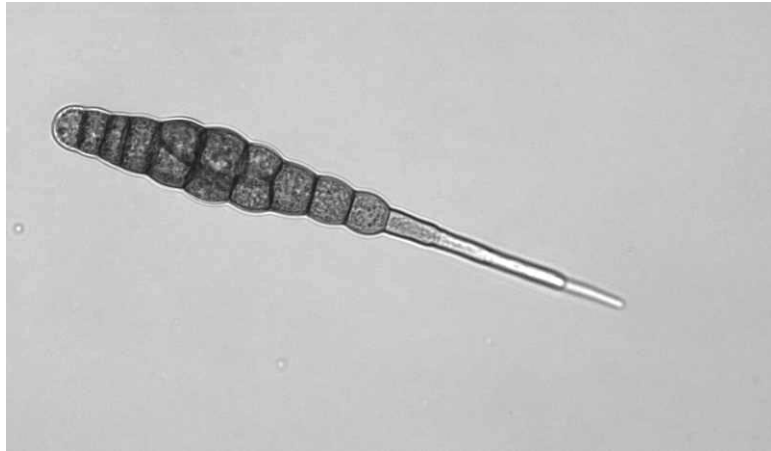


Morphological parameters of *A. solani* and *A. tomatophila* isolates



Conidial size of large-spored *Alternaria* species

A. solani



61-104 98-144
162-243 μm

A. tomatophila



59-97 133-200
212-279 μm

Assessment of aggressiveness of *Altearnia* isolates using potato and tomato leaf discs

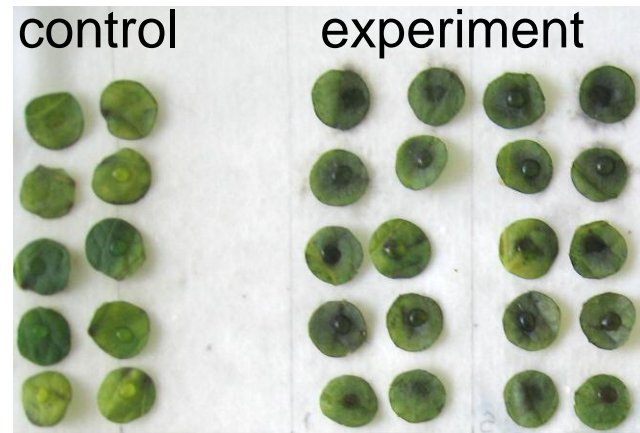
Plants grown in the laboratory



Leaf discs on moist paper
10 μ l drop with 5×10^3 conidia/ml

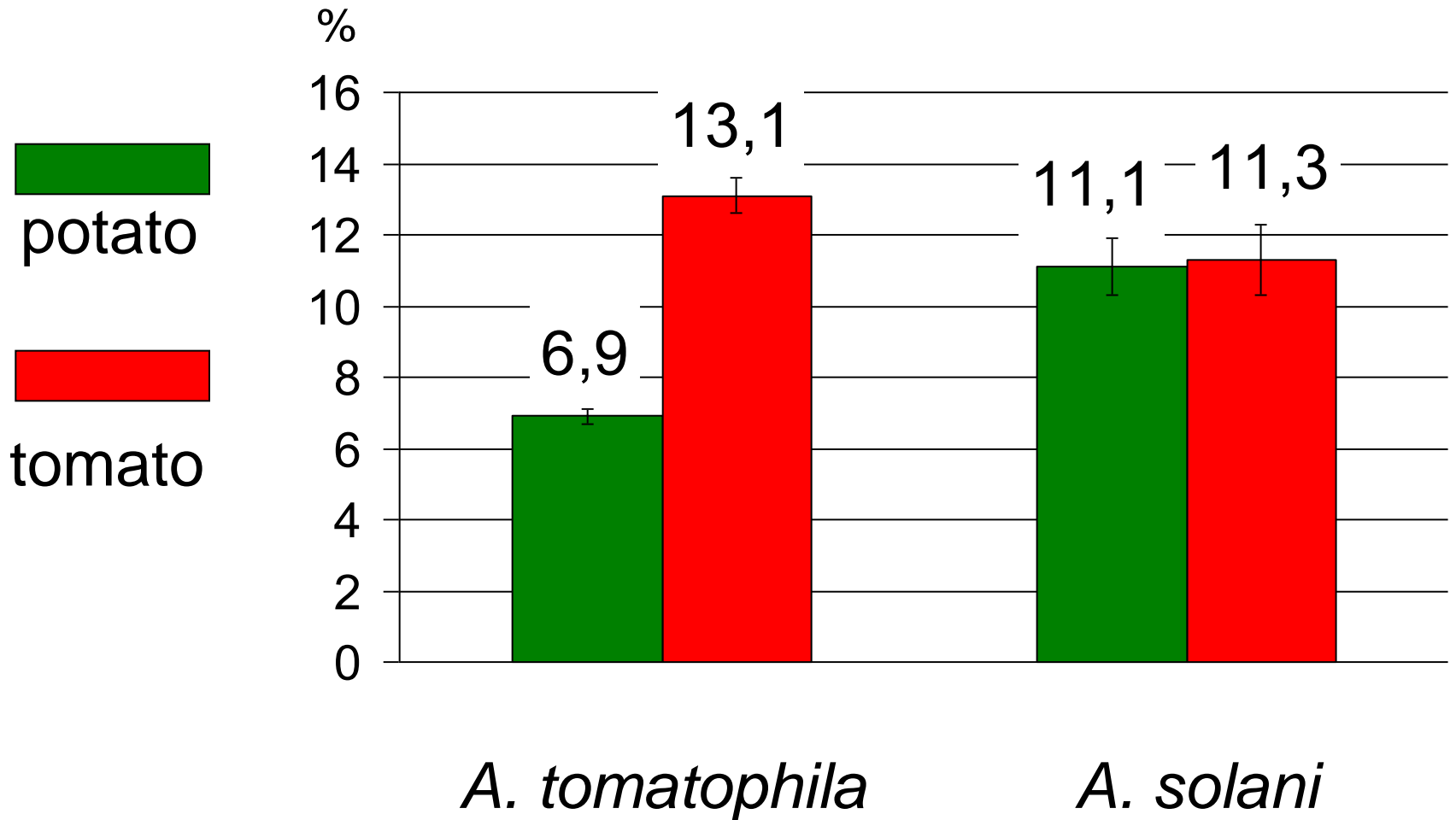


Necrotic lesions, 5 dpi



Aggressiveness of large-spored *Alternaria* isolates on potato and tomato

The average necrotic area of leaf discs



Conclusion

Species composition associated with early blight of potato in Russia was inventoried according to modern taxonomy for the first time.

A. tenuissima and *A. arborescens* are the most common species on potato.

A. arborescens has been found on potato for the first time in Russia.

Difference between *A. solani* and *A. tomatophila* was confirmed using morphological characteristics, aggressiveness and molecular markers.

Acknowledgments



Dr. Nina V. Mironenko

All-Russian Institute of Plant
Protection (VIZR),
St. Petersburg



Dr. Emory G. Simmons

Indiana, USA

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