SURVEY OF '*CANDIDATUS* PHYTOPLASMA SOLANI' PRESENCE IN SOME AGRICULTURAL CROPS

Aighiuni BAHSIEV *, Irina ZAMORZAEVA
Institute of Genetics, Physiology and Plant Protection, Moldova State University, Chisinau, Republic of Moldova

*Corresponding author: aighiuni.bahsiev@sti.usm.md

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Background: '*Candidatus* Phytoplasma solani' is a distinct species of the class Mollicutes (16SrXII group), characterized by phloem-limited localization and strong host dependence. It is widely distributed, mainly in Europe, and affects over 100 plant species, including economically important crops for Moldova. The name reflects its significant impact on plants of the *Solanaceae* family, causing stolbur disease. It also infects grapevine, pepper, maize, lavender, and other crops. Climate change has favored the spread of the pathogen and its insect vectors into new regions and host plants. Therefore, monitoring and controlling its dissemination in economically important crops is essential. Accurate diagnosis can be achieved by molecular methods, with PCR-based techniques offering a reliable and cost-effective approach.
The aim of the study was to determine the presence or absence of infection in some agricultural crops: tomato, maize, potato, pepper, eggplant, wheat, plum and apple growing in experimental fields of Institute of Genetics, Physiology and Plant Protection, MSU.
Materials and methods: Various DNA extraction methods were used depending on plant culture: boiling in alkaline solution, DNAzol, SDS, CTAB. Nested PCR analysis was carried out using specific to '*Ca*. P. solani' primers designed on the base of chaperonine or 16S rRNA gene sequences. Amplification results were recorded using gel agarose electrophoresis (1.5% agarose, 0.5 x TBE buffer) stained with ethidium bromide and visualized in UV.
Results: A comprehensive study of tomato conducted during 2016–2025 showed the continuous presence of the pathogen, with infection rates reaching up to 72% depending on annual conditions, confirming the high susceptibility of tomato to *'Ca. P. solani'*. In potato, 14.6% of plants were infected, while sweet pepper showed a much lower incidence of 4%. Overall, the results indicate the predominant distribution of the pathogen within the *Solanaceae* family, further supported by its detection in the ruderal species *Solanum nigrum*. The phytoplasma was not detected only in eggplant among the analyzed Solanaceae species. In contrast, molecular diagnostics gave negative results in crops from other families, including maize and wheat (cereals), as well as apple and plum (fruit crops). The pathogen was not detected in orchard trees during either the dormant or fruit-bearing stages.
Conclusions: Thus, obtained results demonstrate an ecological and epidemiological specificity of '*Ca*. P. solani' for certain host species, characterized by a high incidence in Solanaceae, particularly tomato. Additionally, the study confirms the potential role of ruderal species within the same family as natural reservoirs of the pathogen. These data contribute to a deeper understanding of the spread of the phytoplasma providing a base for effective monitoring and phytosanitary management strategies.
Keywords: '*Candidatus* Phytoplasma solani', stolbur spread, molecular diagnosis, host plants.

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