



MOLECULAR AND MORPHOLOGICAL DETECTION OF *Globodera rostochiensis* (NEMATODA: HETERODERIDAE) IN A SEED POTATO CROP

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INTRODUCTION

Potato (*Solanum tuberosum* L.) is one of four major food crops in the world beside wheat, maize and rice. The plant originated in the highlands of Peru particularly the region around Lake Titicaca and it was first domesticated at least 7 000 years ago. The food security provided by potato and maize allowed the development and survival of civilizations such as, Huari and Inca for centuries. In the 16th century the Spanish conquistadores searching for the "treasure of the Andes" brought to Europe, besides gold, potato along with its parasites – the potato cyst nematodes (PCN): *Globodera rostochiensis* (Wollenweber) Behrens and *G. pallida* (Stone) Behrens, two nematode species that have quarantine status. The morphology of potato cyst nematodes was until recently almost the only way to identify these quarantine organisms. In the last two decades, molecular analyses as new trends in modern agriculture, contributed to faster and more efficient identification of these species and allowed insight into the genetic structure of those parts that were practically inaccessible by morphological studies. The nematodes are present in all European potato growing regions, especially in the Balkan (Helm) peninsula, either PCN or both are reported.

MATERIAL AND METHOD

The collected specimens of cysts were found in soil originating from a seed potato crop in a village near Gornji Milanovac after the official phytosanitary control in 2022. Individual cysts were used for DNA extraction with a Dneasy blood & tissue kit. The PCR was done with primers for direct sequencing: TW81 and AB28. The ITS1-5.8S-ITS2 region of PCN is used for confirmation of species identity together with its morphological characterization. According to EPPO Standards, the morphological identification comprised larval and cyst characteristics namely, larval stylet length and stylet knob shape, cyst vulval basin diameter, distance between vulva and anus, Granek's ratio, and number of cuticular ridges in perineal area.



Fig. 1 *Globodera rostochiensis* cyst

DISCUSSION

Results confirmed the species identity. The morphology (Fig. 1) of our population of *G. rostochiensis* was similar to the previously reported domestic and foreign populations. The degree of similarity was expressed as a percentage of direct matching i.e. pairwise distances.

CONCLUSION

The phylogenetic analyses indicated a possible ancestor of our PCN population showing evolutionary relationships among world populations of *G. rostochiensis* and a phylogenetic placement of the Serbian population (Fig. 2).

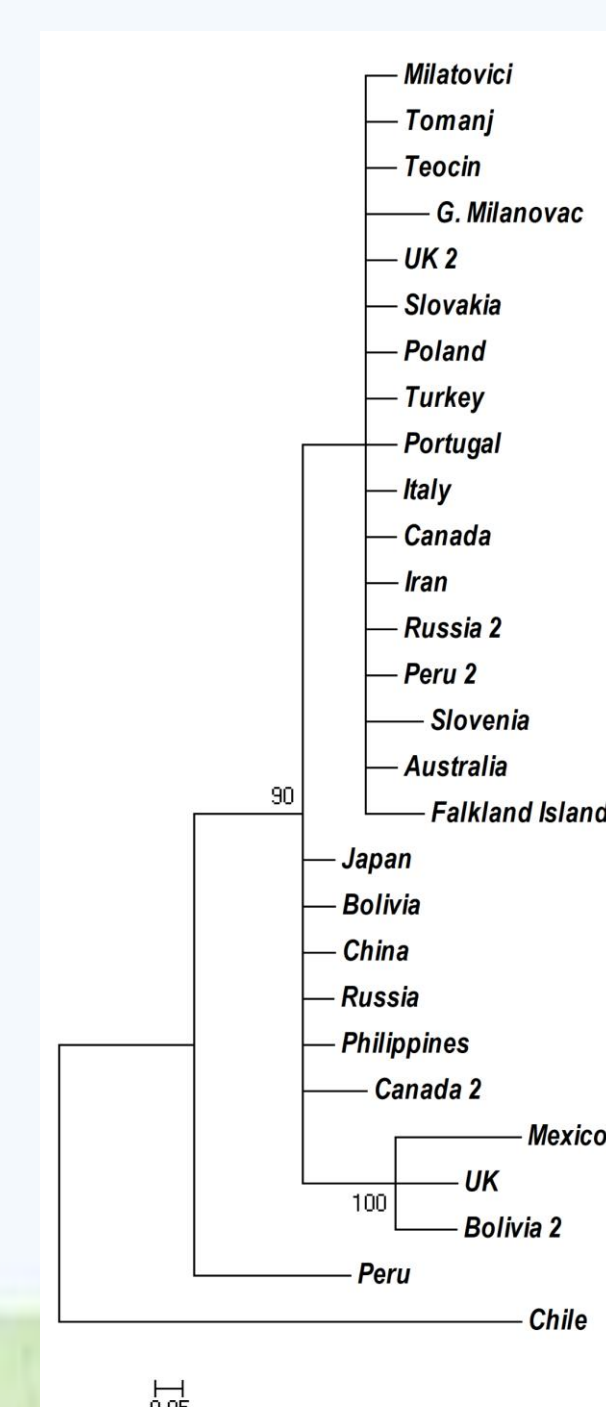


Fig 2. Bayesian dendrogram of *G. rostochiensis* populations

Key words: PCN, phylogeny, morphology

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