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Study of Potato Cyst Nematodes (Globodera Rostochiensis, Globodera pallida) in Georgia

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Abstract : Potato is one of the leading agricultural crops in Georgia. Georgia produces early and late potato varieties in almost all regions. Potato production is equal to 25,000 ha and its average yield is 20-25 t/ha. Among the plant pests that limit potato production and quality, the potato cyst nematodes (Globodera pallida (Stone) Behrens and Globodera rostochiensis (Wollenveber) Behrens) are harmful around the world. PCN is among the most difficult plant pests to control. Cysts protected by a durable wall can survive for over 30 years . Control of PCN (G. pallida and G. rostochiensis) is regulated by Council Directive 2007/33/EE C. There was no legislative regulation of these pests in Georgia before 2016. By Resolution #302 from July 1, 2016, developed within the action plan of the DCFTA (Deep and Comprehensive Free Trade Area) the Government of Georgia established control over potato cyst nematodes. The Agreement about the legal acts approximation to EU legislation concerns the approval of rules of PCN control and research of these pests. Taking into consideration the above mentioned, it is necessary to study PCN (G. pallida and G. rostochiensis) in the potato-growing areas of Georgia. The aim of this research is to conduct survey of potato cyst nematodes (Globodera rostochiensis and G. pallida) in two geographically distinct regions of Georgia - Samtskhe - Javakheti and Svanetii and to identify the species G. Rostochiensis and G. Pallida by the morphological - morphometric and molecular methods. Soil samples were taken in each village, in a zig-zag pattern on the potato fields of the private sector, using the Metlitsky method. Samples were taken also from infested potato plant roots. To extract nematode cysts from soil samples Fanwick can be used according to standard methods by EPPO. Cysts were measured under a stereoscopic microscope (Leica M50). Identification of the nematod species was carried out according to morphological and morphometric characteristics of the cysts and larvae using appropriate protocols EPPO. For molecular identification, a multiplex PCR test was performed by the universal ITS5 and cyst nematodes' (G. pallida, G. rostochiensis) specific primers. To identify the species of potato cyst nematodes (PCN) in two regions (Samtskhe-Javakheti and Svaneti) were taken 200 samples, among them: 80 samples in Samtskhe-Javakheti region and 120 in Svaneti region. Cysts of Globiodera spp. were revealed in 50 samples obtained from Samtskhe-Javakheti and 80 samples from Svaneti regions. Morphological, morphometric and molecular analysis of two forms of PCN found in investigated regions of Georgia shows that one form of PCN belongs to G. rostoshiensi; the second form is the different species of Globodera sp.t is the subject of future research. Despite the different geographic locations, larvae and cysts of G. rostoshiensi were found in both regions. But cysts and larvae of G. pallida were not reported.
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