New Disease Reports

First report of *Globodera rostochiensis* infesting potatoes in Kenya

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Potato (*Solanum tuberosum*) is the second most important food crop in Kenya after maize (MOA, 2007). However, increased production in Kenya has been constrained by various factors including pests and diseases. Potato cyst nematode (PCN) is a major threat to potato production in various parts of the world leading to losses of up to 80%, and sometimes total crop failure. However, it has been reported in only a few countries in Africa (Knoetze *et al*., 2006). Early detection and identification of PCN is essential in designing proper regulatory measures to thwart further spread as well as designing a proper management strategy (Hlaoua *et al.*, 2008). The aim of this study was to investigate whether PCN is present in potato producing areas of Nyandarua County, Kenya.

Surveys targeting the potato crop were conducted during 2014 when soil samples were collected from five potato-growing areas of Nyandarua County leading to the recovery of what appeared to be PCN cysts from cv. Cangi and other unidentified farmer varieties. The potato crop in the surveyed area had patches of poor growth with potatoes showing severe stunting, yellowing, wilting and reduced size of the tubers. Close examination of the root system showed tiny white, yellow or brownish pin-head size cysts. The cysts and second stage juveniles (J2) were extracted from the soil samples and their morphological characteristics examined using a light microscope.

The morphological characteristics of the isolated cysts (Fig. 1) and second stage juveniles (Fig. 2) matched those of *Globodera* spp. The cysts were smoothly rounded, almost spherical, with small projecting neck but without terminal cone, circumfenestrate opening of the perineal area and subterminal anus. The cuticular ranges (n=15) were 18.10 ± 1.21 (16-20), the Granek's ratio 3.27 ± 0.15 (2.83-4.05). Second stage juveniles were vermiform with tapering ends, had a slightly larger and robust stylet and a prominent hyaline tail region. The J2 (n=15) had rounded knobs 3.94 ± 0.40 (3.13-4.46) µm, stylet length 20.70 ± 1.05 (19.30-22.70) µm, body length 447.78 ± 30.93 (395.00-480.00) µm, tail length 51.12 ± 4.74 (44.30-57.00) µm, and the hyaline tail length 27.28 ± 2.76 (24.3-33.0) µm.

The morphological diagnosis was confirmed by multiplex PCR and gene sequencing. DNA was extracted from twenty nematode cysts as described by Bulman & Marshall (1997). The extracted DNA was amplified using two species-specific primers, PITSp4 for *Globodera pallida* and PITSr3 for *Globodera rostochiensis* (Bulman & Marshall, 1997) in combination with STI5 universal primer (White *et al*., 1990). The PCR products were purified and sequenced at Inqaba Biotechnical Industries (Pty) Ltd. in South Africa. The PCR amplification for all the four analysed samples produced 434 bp products with the PITSr3 primer used for the identification of *G. rostochiensis*. However, no amplification was produced with the specific primers for *G. pallida*. A BLAST search with the generated sequences showed they shared over 98% identity with *Globodera rostochiensis* deposits in NCBI (Fig 3). The four nucleotide sequences were deposited in GenBank (Accession Nos. KP283532-KP283535). To our knowledge, this is the first report of PCN in Kenya where they are considered quarantine pests. Since this work was carried out only in a localised area, little is known about the origin and the distribution of this pest in Kenya, which should be investigated.

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Figure 1

Figure 2

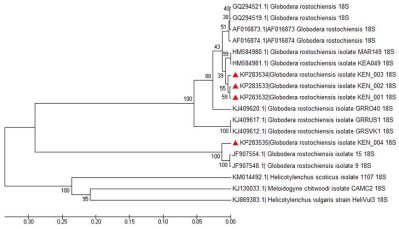

Figure 3

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