Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Black Scurf Caused by *Rhizoctonia solani* AG-3 on Potato Tubers in Mauritius

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Potato (*Solanum tuberosum* L.) is considered as one of the most economically important nonsugar food crops in Mauritius, with annual production of over 14,000 tonnes (Statistics Mauritius 2018). In September 2019, in a seed potato field located in Saint Pierre, approximately 10% of tubers showed the presence of numerous irregular-shaped black scurf lesions on the surface. After surface sterilization of tubers with 70% alcohol, the presumed sclerotia were directly transferred to chloramphenicol-amended potato dextrose agar (PDA) and incubated for 5 days at 25°C in the dark. From all sampled tubers, only fast-growing, pale brown *Rhizoctonia*-like colonies grew, from which hyphal-tip isolates with uniform morphology were obtained. Following staining with aniline blue using the clean slide technique, cells of the isolate were observed to be multinucleate, with typical characteristics of *Rhizoctonia solani* AG-3 including hyphal branching at right angles, slight constriction and septum near the branch base, presence of typical moniloid cells, and formation of light-brown irregular-shaped sclerotia of average size 2 mm (Tsrör 2010). Identification was further conducted by sequencing of the internal transcribed spacer rDNA region. Total DNA was extracted directly from mycelium using a DNeasy Plant Mini Kit (Qiagen, Hilden, Germany), following the manufacturer's instructions. Polymerase chain reaction amplification and sequencing were performed with

primers ITS1-F (5'-CTTGGTCATTAGAGGAAGTAA-3') (Gardes and Bruns 1993) and ITS-4 (5'-TCCTCCGCTTATTGATATGC-3') (White et al. 1990). The nucleotide sequence of the representative isolate 448G-19/M (accession no. MT523021) was compared with those available in GenBank and shared 99 to 100% identity with over 20 *R. solani* AG-3 isolates (100% with isolate 16-107, Salamone and Okubara 2020). Therefore, based on the morphological characteristics and sequence homology, the isolate was identified as *R. solani* AG-3. Koch's postulates were confirmed for the isolate by carrying out the pathogenicity tests. Twenty healthy, unwounded tubers were disinfected for 1 min with 50% commercial bleach (2% NaOCl) and individually placed in pots (20 cm ø) containing sterile substrate. Ten tubers were inoculated by placing colony fragments of 7-day-old cultures of isolate 448G-19/M near each tuber during planting. Similarly, 10 tubers inoculated with sterile PDA served as a negative control. Plants were maintained in a greenhouse, watered daily, and assessed for the presence of symptoms 60 days postemergence. All inoculated plants exhibited partial root necrosis, and progeny tubers showed black scurf due to presence of sclerotia. Control plants remained symptomless. From all symptomatic tubers, the original isolate was successfully recovered and identified by the morphological and molecular characteristics mentioned above, thus fulfilling Koch's postulates. Although occurrence of potato black scurf had previously been observed in Mauritius (Anonymous 1927), to the best of our knowledge, this the first report confirming *R. solani* AG-3 as a causal agent of black scurf on seed tubers in Mauritius. Early detection of *R. solani* AG-3 during potato seed production is necessary to prevent its dispersal via infected tubers to other fields around the island. This research is significant because it will contribute to the body of knowledge on potato pathology in Mauritius and at the same time assist in reducing losses associated with this important crop.

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