First Report of *Rhizoctonia solani* AG 4 HGIII Causing Potato Stem Canker in South Africa

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Black scurf and stem canker caused by *Rhizoctonia solani* are potato diseases of worldwide economic importance (*Solanum tuberosum* L.) (4). The *R. solani* species complex consists of 13 anastomosis groups (AGs) of which AG 3-PT is implicated as the dominant causal agent of potato diseases globally (2). However, other AGs such as AG 2-1, 5 and 8 have been implicated in causing potato diseases (3). In February 2013, potato stem and tuber samples (cv. Mondial), displaying dark brown stem lesions associated with *Rhizoctonia* stem canker symptoms, and atypical symptoms on tubers were obtained from a commercial field in Limpopo province, South Africa.

Rhizoctonia solani was isolated by excising 4 mm long stem pieces and tuber peels from the margins of symptomatic tissues and placing them on 2 % water agar supplemented with 20 mg/l chloramphenicol. Single hyphal tips taken from three fungal isolates identified as *R. solani* based on morphological traits (2) were transferred to potato dextrose agar (Biolab). DNA was extracted from the resulting cultures as the rDNA ITS region was sequenced as previously described (Muzhinji et al 2013) .The resulting sequences of three isolates Rh 81, Rh 82 and Rh 83 (KF712285, KF712286 and KF712287), were 99 % similar to those of AG 4 HG-III found in GeneBank (DQ102449and AF354077).

To determine pathogenicity of the AG 4 HGIII isolates, certified disease free mini-tubers (cv. Mondial) were used in pot trials. Barley grains sterilized by autoclaving for two consecutive days at 121°C for 20 min were inoculated with each isolate. Subsequently, 10 g of colonized barley grains were placed 10 mm above each mini-tuber planted in a sterile potting mixture of

sand:clay:pinebark (1:1:1) m/m in sterilized plastic pots (5 l), Ten tubers were inoculated with each isolate.Control plants received sterile barley grains only. Plants were grown in a greenhouse maintained at 22^{o}C under natural light conditions?. After 7 weeks, 5 plants for each isolate were destructively sampled and assessed for stem canker symptoms. At 120 days after sowing, the remaining 5 plants per each treatment were assessed for blemishes on progeny tubers. The stem canker incidences of plants inoculated with Rh 81, Rh 82, and Rh 83 were 25, 25, and 50%, respectively, whereas no symptoms were observed in the control plants . Sclerotia formation and atypical blemishes were not observed on any of the progeny tubers. *R. solani* AG 4 HG-III was consistently re-isolated from symptomatic stems displaying brown lesions, and the identity of the re-isolates were confirmed by the molecular characteristics as previously described, therby fulfilling Koch's postulates.

Potato stem canker caused by *R. solani* AG 4 HG-III has not been previously reported elsewhere. To our knowledge, this is the first report of *R. solani* AG 4 HG-III causing stem canker on potato in South Africa and worldwide. It is known that *R. solani* has a wide host range and that AGs differ in fungicide sensitivity (4), thus knowledge of which AGs are present in crop production systems is important when considering disease management strategies such as crop rotation and fungicide treatments.

References: Muzhinji et al 2013 (2) C. Campion et al. Eur. J. Plant. Pathol. 109: 983. 2003 (3) J.W. Woodhall et al., Plant. Pathol. 56:286–295, 2007. (4) L. Tsror. Phytopath. 158, 649-658, 2010.

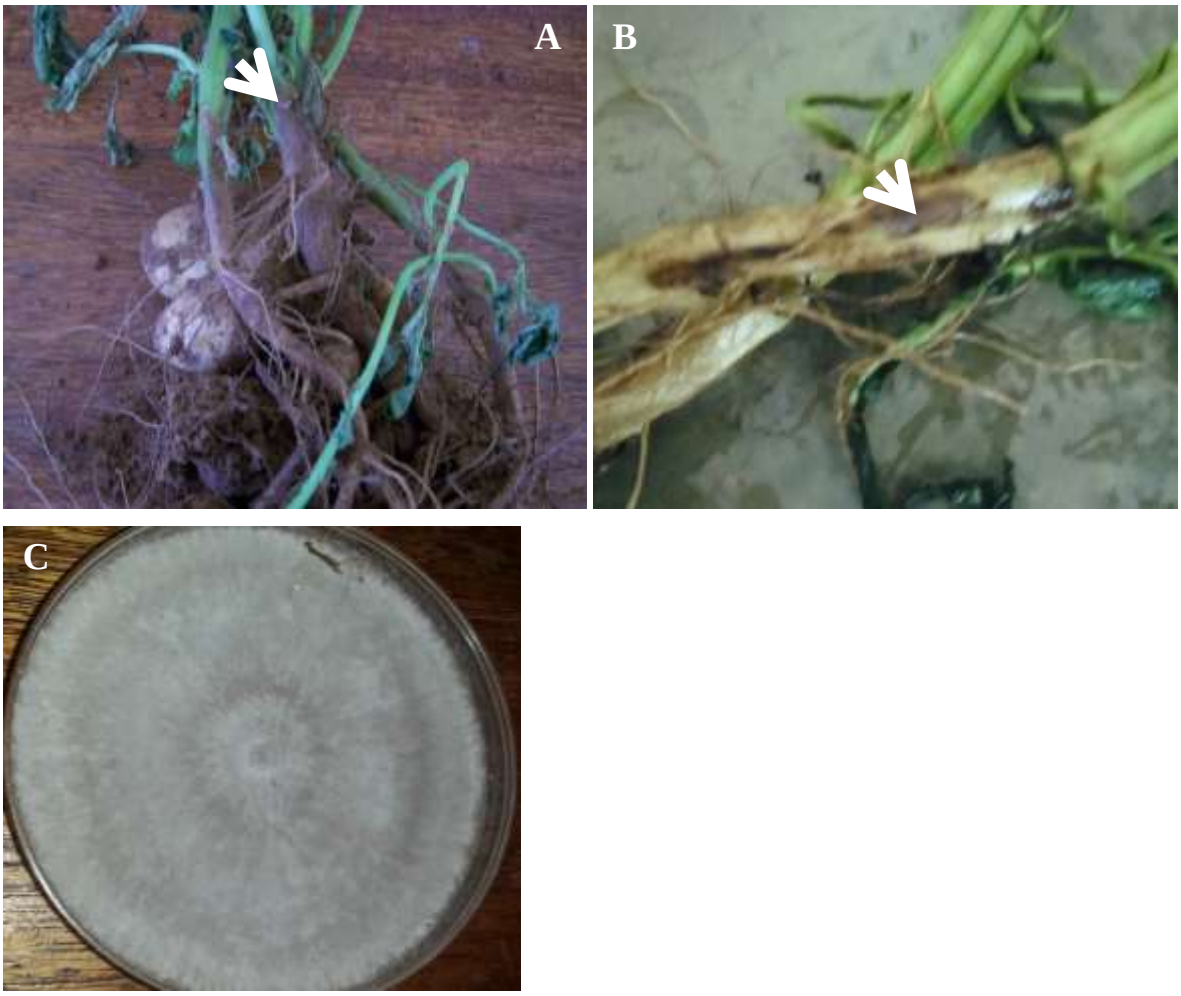

Figure 1. **A**. Potato plant showing stem canker symptom where isolate Rh 83 was isolated from **B.**. Stem canker lesion from pathogenicity test **C.** AG 4 HG III appearance on PDA plate after 10 days