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First report of loose kernel smut of sorghum caused by *Sporisorium cruentum* (Syn: Sphacelotheca cruenta) in Egypt

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In 2017, sorghum plants (Sorghum bicolor cv. Dorado) cultivated in several areas in Upper Egypt (Qena governorate), exhibited symptoms of loose kernel smut (LKS) disease. In the field, plants initially affected by LKS were most stunted, had thin stems, and panicles emerging earlier than those of healthy plants. Later, all kernels of infected panicle were rapidly replaced by smut sori (approx. 1.0-1.5 cm in length and 0.4-0.5 cm in width). Smut sori are surrounded by a thin gray membrane that is often ruptured soon after panicle emerging from the boot (Gassó et al., 2017). Following rupture of the membrane, a powdery and black smut mass (teliospores) is dispersed leaving a clearly visible central and curved columella inside the sorus. Panicles of infected plants showing LKS symptoms were immediately collected and sampled in paper bags. Then smut masses were passed through a sieve (100-menschen screen) and stored at ambient temperature in the laboratory for further studies. The smut fungus was identified as *Sporisorium cruentum* (Syn.: *Sphacelotheca cruenta*) based on morphological characteristics of the teliospores and their germination on water agar previously described (Tarr, 1962; Langdon & Fullerton, 1978; Anonymous, 1990; Frederiksen & Odvody, 2000). Examined teliospores were spherical, tinted, smooth and 6-10 µm in diameters. They germinated on water agar forming a 4-celled promycelium (basidium) on which terminal and lateral sporidia (spindle-shaped or oblong) were produced. Koch's postulates were performed in pots under greenhouse conditions to confirm the pathogenic capability of 5 isolates obtained. Grains of Sorghum cv. Dorado was surface sterilized with 70% ethanol for 2 min, soaked in sterile tap water for 6 h, air-dried thereafter and then inoculated by thoroughly dusting them with teliospores at the rate 5 g × kg-1 of grains (Moharam et al., 2012). After inoculation, 5 grains were sown in each pot and the pots were irrigated daily. The growing plants were left until panicles emerging and symptoms appeared. Symptoms of LKS were similar to those observed in panicles of sorghum plants infected in the fields. Identical teliospores morphology and germination of the fungus were obtained from infected panicles of artificially inoculated plants. Mycelium of *S. cruentum* was also noticed in tissues of the apical buds and nodes of inoculated plants (28-day-old) when hand-cut sections were stained with trypan blue using the technique described by Moharam et al. (2012), but not from tissues of control plants inoculated with sterile sorghum flour only. This experiment was repeated twice with the same obtained results. The causal organism is less widespread than covered kernel or long smut caused by *S. sorghi* and *S. ehrenbergii*, respectively in West Africa and Asia, moreover it attacks all group of sorghums causing a considerable damage in the yield (Anonymous, 1990; Gwary *et al.*, 2007; Gwary *et al.*, 2009; Kutama et al., 2011). In Egypt, this is the first report for occurrence of LKS on sorghum and the current work, therefore, suggesting that a wide survey should be performed in all areas where sorghum cultivated to study the distribution of the pathogen and existence of its physiological races that could be developed.

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