First report of loose kernel smut of sorghum caused by Sporisorium cruentum in Egypt

M.H.A. Moharam

In 2017, sorghum plants (Sorghum bicolor cv. Dorado) cultivated in several areas in Upper Egypt (Qena governorate), exhibited symptoms of loose kernel smut disease (Fig. 1). In the field, plants affected by loose kernel smut were initially mostly stunted, had thin stems, and panicles which emerged earlier than those of healthy plants. Later, all kernels of infected panicles were replaced by smut sori (approx. 1.0-1.5 cm × 0.4-0.5 cm). The sori were surrounded by a thin grey membrane that often ruptured soon after the panicle emerged from the stem. Following rupture of the membrane, a powdery black smut mass (teliospores) was dispersed leaving a clearly visible central and curved columella inside the sorus.

Panicles of infected plants were collected in paper bags. Smut masses were passed through a sieve (100 micron filter) and stored at ambient temperature in the laboratory for further study. The smut fungus was identified as Sporisorium cruentum based on morphological characteristics of the teliospores and their germination on water agar (Tarr, 1962; Langdon & Fullerton, 1978; Frederiksen & Odvody, 2000). Teliospores were spherical, tinted, smooth and 6-10 μm in diameter. They germinated on water agar forming a four-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 pathogenicity of five selected isolates. Grain of sorghum cv. Dorado was surface sterilised with 70% ethanol for two minutes, soaked in sterile tap water for six hours, air-dried and inoculated by thoroughly dusting them with teliospores at the rate 5 g/kg of grain (Moharam et al., 2012). After inoculation, five grains were sown in each pot and the pots were irrigated daily. The growing plants were left until panicles emerged from the stem. Following emergence of the panicle, all kernels of infected panicles were replaced by smut sori (approx. 1.0-1.5 cm × 0.4-0.5 cm). The sori were surrounded by a thin grey membrane that often ruptured soon after the panicle emerged from the stem. Following rupture of the membrane, a powdery black smut mass (teliospores) was dispersed leaving a clearly visible central and curved columella inside the sorus.

Acknowledgements

The author would like to thank Mr. Ahmed Amer in the Agricultural Research Station, ARC, El Matana, Qena for his kind help and technical assistance.

References


