Abstract

Sorghum is a staple food crop and plays a critical role in subsistence farming in Kenya due to its adaptability to marginal agro-ecological zones. However, fungal diseases are among the major biotic constraints of sorghum production, causing over 70% yield loss in susceptible cultivars. Information on the distribution and severity of fungal diseases is important to establish efficient and improved strategies for integrated disease management of sorghum fungal diseases. The aim of this study was to determine the prevalence, incidence, severity and spatial distribution of fungal diseases on sorghum across agro-ecological zones of lower eastern Kenya. A total of 384 smallholder farmers' fields were surveyed, and in each field, 30 plants were assessed for prevalence and incidence of fungal diseases using a W-shaped pattern to cover the whole field. Sorghum anthracnose was the most prevalent disease (71%), followed by leaf blight (70.18%), rust (68.41%), smut (63.02%), sorghum mildew (55.33%), Alternaria leaf spot (48.39%) and rough leaf spot (46.02%). Disease prevalence, incidence and severity varied among the investigated agro-ecological zones. There was a significant difference ($p \leq 0.05$) in fungal disease severity across the investigated agro-ecological zones. Spatially interpolated disease maps showed a high variation in the distribution of various sorghum fungal diseases across the investigated agro-ecological zones of lower eastern Kenya. Morpho-cultural identification revealed the association of *Colletotrichum sublineola* with anthracnose, *Curvularia lunata* and *Bipolaris cynodontis* with leaf blight, *Puccinia purpurea* with rust, *Peronosclerospora sorghi* with downy mildew, *Alternaria alternata* with Alternaria leaf spot, *Ascochyta sorghi* with rough leaf spot and *Sporisorium sorghi* with covered kernel smut symptoms. Information obtained in this study will be useful to update knowledge on sorghum fungal diseases and provide a basis for the development of strategies for management and control of the investigated diseases.