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A Note

First Report of [*Ustilago cynodontis* (Henn.) Henn: Ustilaginales] the Causal Agent of Smut of Couch grass *Cynodon dactylon* (L.) Pers. In South Sudan

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Smut of couch grass (Cynodon dactylon), incited by the basidiomycete fungus Ustilago cynodontis, was first observed on couch grass in Juba (latitude 40 51' N, longitude 310 35' E) and Yei (latitude 40 09' N, longitude 300 07' E); at an elevation of approximately 470 meters above sea level in Central Equatoria State, South Sudan in July 2013. Thereafter, limited surveys were planned and conducted in June 2014 targeting five suburbs in Juba town and an area around the crop training center (CTC) in Yei. The mean percentage disease incidence for the areas covered by the study were; 16.21%; 28.47%; 6.46% and 19.98% for Hai-Thoura and Ministries complex; Munuki Block C; Munuki 107; and Kator in Juba County and 7.2% in CTC area in Yei County, respectively. The study found smut of couch grass to be widespread in the areas covered and recommends that; further studies on the host range and possible pathogen cross over studies should be carried out under South Sudan conditions to deepen the knowledge spectrum for this disease and its future implications on the production of other cereal crops in the country.

Keywords: Ustilago cynodontis, couch grass, smut disease, South Sudan

INTRODUCTION

Bermuda grass, *Cynodon dactylon* (L.) Pers., *also* known as couch grass is an important grass species widely grown on lawns in many countries of the world. It is a hardy rhizomatous grass and has a beautiful look if well taken care of. However several diseases have also been reported to infect Bermuda grass thus, greatly reducing their value and making lawns unsightly. Infections by some fungi causing rust and smut on *Cynodon dactylon* has a serious impact on the growth and development of the grass itself and on the crop plants growing in the nearby fields. Infection caused a reduction in overall dry matter production and the growth rate of stolons, changed the allocation of resources between roots and shoots, and affected the general survival of the grass. Couch smut (*Ustilago cynodontis*) was first recorded in New South Wales in 1907 and is prevalent throughout the mainland states of Australia (Shivas and Vanky, 2001). Dung *et al.* (2014) indicated that although couch grass is seed borne, most of its propagation in nature occurs through rhizomes. Meanwhile, smut disease of couch grass is mostly seed borne, transmission of the pathogen along stolons was incomplete, especially as the length of the stolon increased. It was also observed that in mixtures of healthy and infected plants, the growth of infected ones was disproportionally affected; however, infection had no effect on the germination or emergence of seedlings (Garcia-Guzman and Burdon, 1997; Farr and Rossman, 2013). In this communication, the occurrence of a smut on couch grass in Juba and Yei Counties in Central Equatoria State (South Sudan) a disease of couch grass similar to that reported by Dung *et al.* 2014; Shivas, 2010) is hereby being described and reported.

Symptomatology

The symptoms appeared when the grass formed flower heads at the onset of the rains. Instead of a healthy, open arrangement of two to six spikes, the spikes fail to open and the seeds are replaced by a mass of black, powdery spores which is also known to be an allergen thus, causing health problems and allergies in some people (Fig. 1). Shoots with infected inflorescences also show a more upright habit of growth, sometimes slightly chlorotic and is particularly unsightly especially in the more prostrate green couch grass cultivars. Infection is often widespread and severe such that all flower heads are smutted, usually seen along road-sides and in some lawns. Also, Marley (1995) indicated *Cynodon dactylon* to be an alternative host for *Sporisorium sorghi* Ehrenb. ex Link. Another smut that causes covered kernel smut of sorghum (*Sorghum* spp.). Nevertheless, this and other alternate hosts yet to come by might further complicate food security issues since South Sudan is about 80% cereal dependent on sorghum maize and millets as a staple in many of the rural communities although substantial amounts of root and tuber crops like cassava, Manihot spp.; sweet potato, *Ipomoea* spp.; and some aroids *Colocasia* spp. and *Xanthosoma* spp. are also grown. Symptomatic plants infected by smut of couch grass were first observed around the main campus of the University of Juba in July 2013. Thereafter, limited surveys were planned and conducted during June 2014, in some suburbs of Juba Town namely, Hai-Thoura and Ministries complex; Munuki Block C; Munuki 107; and Kator in Juba County and around the Crop Training Center (CTC) in Yei County. The mean percentage disease incidence estimated from five 1 m x 1 m quadrat counts at three sites per suburb were 16.21%; 28.47%; 6.46% and 19.98% for Hai-Thoura and Ministries complex; Munuki Block C; Munuki 107; and Kator in Juba County and 7.2% in CTC area in Yei County, respectively. Apparently, *Ustilago cynodontis* is widespread on couch grass in the areas covered by the study. Also, according to Marley (1995) couch grass is an important alternate host for other cereal smuts especially *Sporisorium sorghi* which causes covered smut of sorghum. Therefore, further studies on the host range, cross over studies, subsequent economic implications should be carried out under South Sudan conditions to deepen the knowledge spectrum for this disease; its economic implications on the production of other cereal crops in the country.

A) Infected patch of couch grass by *U. cynodontis*.

(B) Infected inflorescences of *C. dactylon*.

(C) Healthy inflorescences of *C. dactylon*.

Figure 1: Symptomatic and healthy plants of couch grass infected by couch grass smut, *Ustilago cynadontis*

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