International Journal of Agricultural Research and Review: ISSN-2360-7971, Vol. 3(7): pp 353-355, July, 2015.

A Note

First Report of *Ustilago maydis* (Pers.) Roussel the Causal Agent of Smut of Corn, *Zea mays* (L.) Pers. In South Sudan: A note

[1]Philip W. Marchelo-d'Ragga, [1] Peter B.S. Gama and [1,2] Beatrice C. Misaka

[1]Department of Agricultural Sciences, College of Natural Resources and Environmental Studies (CNRES), University of Juba, P.O. Box 82 Juba, South Sudan.
[2]Norwegian University of Life Sciences NMBU, P.O. Box 1432, AAS, Norway.

Corresponding Author's: E-mail: philipwanim@yahoo.com; Phone: +211 (0) 928231001; (0) 956802458.

Accepted 6th June, 2015

Surveys were conducted in two main maize (Zea mays L.), producing Counties of Yei and Morobo in Central Equatoria State, South Sudan; during the second cropping season of 2013/14. The objectives were initially to collect maize leaf samples in an 'ad hoc' disease monitoring exercise for Maize Lethal Necrosis virus Disease (MLND) which is a new emerging disease problem in the East African Region with especially devastating effects in Kenya and Uganda. Twenty maize fields were chosen randomly for inspection/ sample collection in each County. Symptomatic maize plants infected with Ustilago maydis were noticed, then incorporated into the package as a survey. Results for the survey indicated a mean incidence of 5% for both counties combined. Therefore, at this stage the disease does not pose a threat to the production of corn. However, the study recommends more studies on host range, initiation of a screening program to identify tolerant/ resistant corn varieties putting up strategies for future management of the disease in case it becomes widespread in the Country.

Keywords: Smut, Ustilago maydis, corn, Zea mays (L.), South Sudan

INTRODUCTION

Maize, *Zea mays* (L.), *also* known as corn is an important member of the poaceae (grass family) widely grown as a staple in many African and other developed/ developing tropical countries of the world (Pataky and Chandler, 2003). Several pests and diseases continue to delimit the full potential of corn production in many countries. Smut of corn is one such disease which is caused by the pathogenic fungus *Ustilago maydis* (Syn. *Ustilago zeae*). It attacks both corn (*Zea* mays) and teosinte (*Euchlena mexicana*). The fungus forms galls on all above-ground parts of corn species, which incidentally is a preferred delicacy in Mexico going under the name *huitlacoche* (corn excrescence) which is usually eaten as a filling, in most tortilla-based foods (Pataky, and Chandler, 2003). Wolff (1995) indicated that infection by the fungus leads to disease symptoms such as chlorosis, anthocyanin formation, reduced growth and the appearance of tumor-like galls harboring the developing teliospores. Yield loss is total in infected plants/ ears (Fig. 1). However, overall yield losses from this disease is minimal due to the often low disease incidence in commercial fields. In this communication, the occurrence of a smut on corn also referred to as blister smut or boil smut of maize in Yei and Morobo counties of Central Equatoria State (South Sudan) a disease of corn that occurs and has been reported in many corn producing countries (Christensen, 1963; Banuett, 1995) is hereby being described and reported in second season corn crop of season 2014/15.

Symptomatology of corn smut

Disease symptoms can appear at any growth stage but is most common when corn plants begin to tassel and corn is in silk stage. The fungus enters the ovaries and infected kernels swell to different sizes; some occasionally grow into golf-ball sized galls. (Fig.1). Pataky and Chandler (2003) indicated that, on corn stalks and on sensitive corn varieties galls can attain

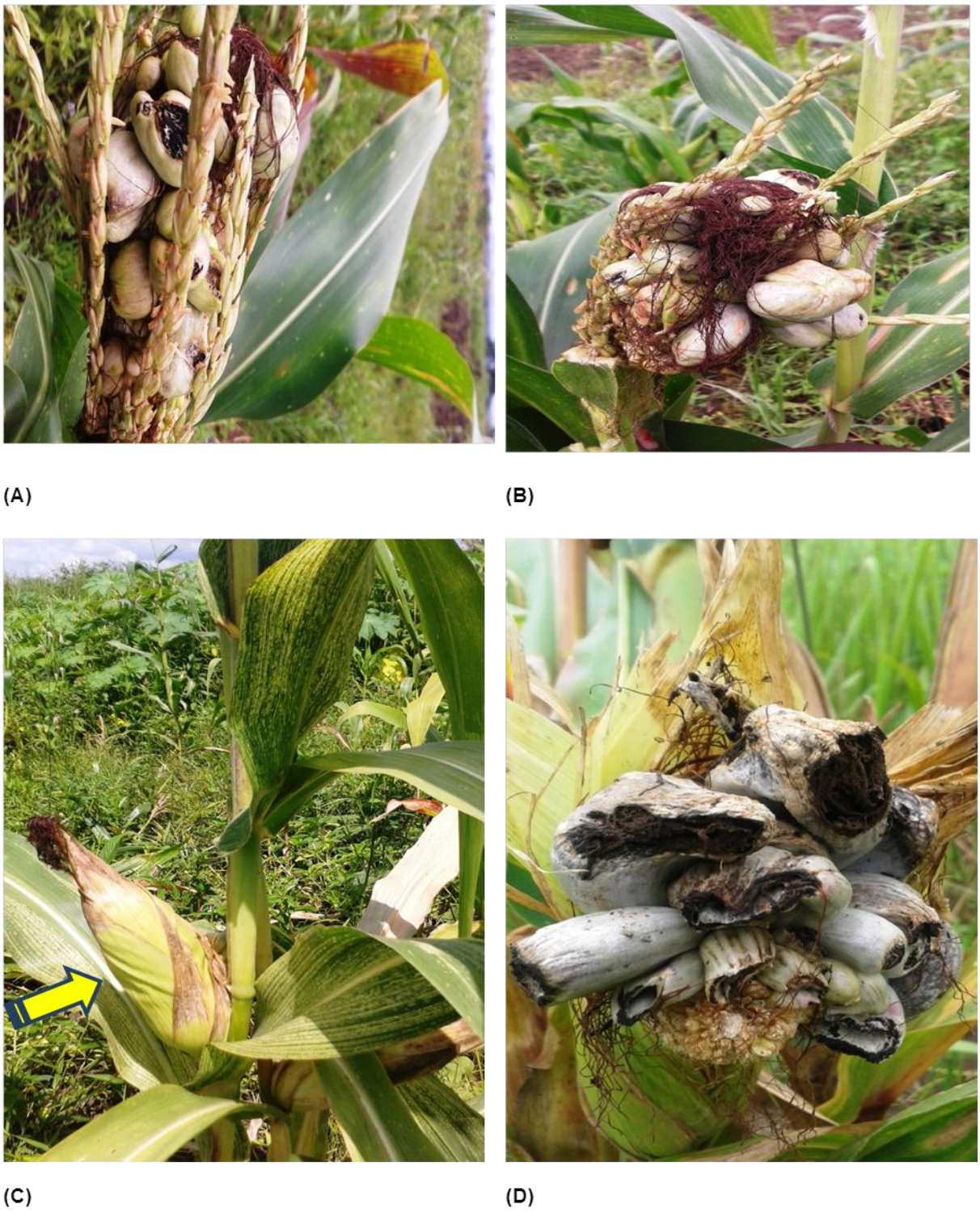

Figure 1: Healthy cob ©, (arrowed) and Symptomatic maize plants (A, B & D) on corn variety “Longe 5” infected by *Ustilago maydis.* Note the enlarged galls of individual kernels.

diameters of up to 20-30 cm and are usually dark, greyish white in color (Fig. 1). The symptomatic maize plants were encountered during a routine survey and sample collection excursions for maize lethal necrosis virus disease (MLND) another new debilitating maize disease in the East African region. Twenty farms were inspected per county and mean incidence of corn smut was found to be less about 5% for both counties combined. Usually, in addition to the gall symptoms (which harbors the developing teliospores in individual kernels the mycelial growth of the fungus inside the plant leads to other symptoms such as chlorosis, anthocyanin formation, and the stunting of corn plants.

REFERENCES

Banuett F (1995). "Genetics of *Ustilago Maydis*, A Fungal Pathogen that Induces Tumors in Maize". Annual Reviews in Genetics 29 (1): 179–208. doi:10.1146/annurev.ge.29.120195.001143. PMID 8825473.

Christensen JJ (1963). "Corn smut caused by *Ustilago maydis*. Monograph no. 2". American Phytopath. Society.

Pataky JK, Chandler MA (2003). Production of huitlacoche, *Ustilago maydis*: timing inoculation and controlling pollination. Mycologia 95:1261-1270.

Wolff B (2006). Professor introduces unusual edible fungus to Madison, University of Wisconsin - Madison News, September 19, 2006.