


NEW DISEASE REPORT

First report of banana bunchy top disease caused by *Banana bunchy top virus* in Uganda

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In August 2020, banana plants with characteristic symptoms of banana bunchy top disease (BBTD) caused by the *Banana bunchy top virus* (BBTV) were observed on two different banana (*Musa* sp.) mats in backyard gardens in Arua City (GPS coordinates: 2°59'36"N 30°54'40"E), West Nile region of Uganda. The plants were severely stunted with short, narrow leaves, chlorotic leaf margins and dark green streaks on petioles and midribs. The affected plants had a rosette-like or bunchy and choked appearance (Figures 1–2).

A PCR using specific primers that amplify a 240 bp conserved domain of the BBTV DNA-mRep segment (Mansoor et al., 2005) confirmed the presence of BBTV in leaf, pseudostem and corm samples of the two symptomatic plants. The PCR product from one of the samples was purified and reverse sequenced (GenBank Accession No. OK066320). This sequence showed 98–99% nucleotide sequence identity with multiple BBTV isolates from India (e.g., KX219591, GU085264), Democratic Republic of Congo (DR Congo; e.g. KU687085, KU687070, KU687068), Benin (e.g. JQ437548), Burundi (e.g. JN204198), Australia (e.g. KM607586), USA (Hawaii; e.g.,

KM607599) and other African and South Pacific countries. To our knowledge, this constitutes the first report of BBTD in Uganda.

BBTV is spread through infected planting materials and by the aphid vector *Pentalonia nigronervosa* (Magee, 1927) that has been reported to be omnipresent in banana-growing regions. BBTD has been reported in much of the DR Congo (Bolo et al., 2014; Tongo Mukwa et al., 2014) including the north-eastern province of Ituri that borders the affected region of Uganda. This infection may have been introduced from the Ituri Province, mainly through infected planting materials. Ituri Province in DR Congo and Arua in Uganda are adjacent and share the same ethnic groups, porous border crossing points and a cross-border connectivity in banana-based production landscapes, potentially enabling the unchecked cross-border exchange of planting materials. Alternatively BBTD may have been introduced into Uganda through the banana aphid vector. The regions of Ituri and Arua share the same altitude range (1,000 to 1,400 m above sea level) with no barriers to prevent movement of the aphid vector. It has been postulated that the Albertine rift valley mountains which are omnipresent at more

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FIGURE 1 Banana plants (cv. Dwarf Cavendish, *Musa* AAA genome) with stunted leaves and yellow leaf margins and a bunched and choked appearance characteristic of banana bunchy top disease



FIGURE 2 Banana plants (cv. Bluggoe, *Musa* ABB genome) with stunted leaves and yellow leaf margins and a bunched and choked appearance characteristic of banana bunchy top disease

southerly latitudes have prevented aphid-mediated spread of BBTD from infested regions in DR Congo into mid-altitude sites in western Uganda.

BBTV is one of the top 100 invasive species in the world (Global Invasive Species Database, 2020). It spreads relatively slowly and gradually by the aphid vector, while spread through planting materials can potentially occur over long distances. Informal plant exchange accounts for about 90% of the supply of banana planting material in Uganda and this may escalate the spread of BBTV, thus over time severely limiting banana production. Once established, the disease is also very difficult to control in small-scale farm settings. It is therefore crucial to understand the current distribution of the virus, to determine its risk to banana production in the West Nile region and Uganda as a whole, and to devise proactive measures for surveillance, timely reporting, and implementation of strict phytosanitary management.

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