



First report of the EU_33_A2 clonal lineage of *Phytophthora infestans* causing late blight disease of potato in Nigeria

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Received: 30 Oct 2019. **Published:** 17 Dec 2019. **Keywords:** oomycete, simple sequence repeat (SSR), *Solanum tuberosum*

Potato (*Solanum tuberosum*) cultivation was introduced into Nigeria in the Jos Plateau in the early 20th century (Zemba *et al.*, 2013) The Jos Plateau is at high altitude, c. 1,200 m above sea level, and has a cool climate favourable for the crop. Nigeria is the fourth biggest producer of potato in sub-Saharan Africa with a production of about 843,000 tonnes per year and the Jos South Local Government Area accounts for 25% of the total production in Nigeria.

The late blight pathogen, *Phytophthora infestans*, has been present in Nigeria since at least 1978 (Erinle & Quinn, 1980) but its severity in the Jos Plateau was reported to have increased dramatically in the 2012, 2013 and 2014 seasons. Favourable conditions for late blight and the importation of seed were hypothesised to be drivers of this change (Zang, 2014), but the pathogen genotypes have not been characterised. The epidemics were again very severe in 2018 despite application of fungicides so a survey of the pathogen population was conducted.

DNA samples were collected using Whatman FTA cards (Li *et al.*, 2013). Lesions from each of seven diseased crops were collected at random in May and July 2018 and pressed separately onto each card. Data on the origin of 42 lesion samples (location, host and cultivar) were also recorded. The fields were located on different farms in three districts in Bokokos (Butura) and Barkin Ladi (Kassa and Heipang) in the Local Government Area. In the sampled areas, most of the farms in Barkin Ladi were not badly affected with about 10% of the total plants having disease, however in Butara, most of the farms were severely affected with almost all plants diseased. The farmers' knowledge of the disease was also assessed. The sampled FTA cards were labeled and transported to the James Hutton Institute. Pathogen genotyping was conducted using multiplex PCR with primer pairs for 12 simple sequence repeat (SSR) loci as described by Li *et al.* (2013) and data were uploaded to the EuroBlight database (www.euroblight.net).

A comparison with a database of national and international late blight genotypes confirmed the identity of the pathogen as *P. infestans* and identified a single genotype, EU_33_A2, from all the sampled diseased leaves. Genotype EU_33_A2 was first found in the Netherlands in 2010 (Schepers *et al.*, 2018) and has been reported in Belgium and Germany (Meier-Runge *et al.*, 2014) but has not been reported previously in Africa. The genotype has been shown to have reduced sensitivity to fluazinam (Schepers *et al.*, 2018) so growers in Nigeria should not use this product to manage late blight. This result indicates a wider distribution of the 33_A2 genotype than previously thought and a possible migration from Europe to Nigeria on seed potatoes. All the potatoes cultivars obtained in this study

(Nicola Green, Roselyn Ruka, Christian Lady, Nicola Yellow, Yona and Marabel) showed susceptibility to *P. infestans* 33_A2.

Farmers' awareness of the disease was very poor and most of the farmers had not heard of *P. infestans*, attributing the disease to supernatural causes, rain or dew. The study highlights the need for farmer education and for monitoring to detect emerging pathogen lineages that threaten food security.

Acknowledgements

We acknowledge the Scottish Government for funding work at The James Hutton Institute and Jens G Hansen and Poul Lassen at Aarhus University, Denmark for the EuroBlight database development and mapping.

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To cite this report: Nnadi NE, Datiri AM, Pam DB, Ngene AC, Okonkwo FO, Sullivan L, Cooke DEL, 2019. First report of the EU_33_A2 clonal lineage of *Phytophthora infestans* causing late blight disease of potato in Nigeria. *New Disease Reports* **40**, 20.

<http://dx.doi.org/10.5197/j.2044-0588.2019.040.020>

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