

What do Chloroplast Sequences Tell us about the Identity of Guinea Grass, an Invasive Poaceae in the Southern United States?

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Abstract

The commonly named Guinea grass of the Poaceae family is a native African grass that has been extensively and successfully introduced as a source of animal fodder to other tropical areas of both hemispheres. On a global scale but particularly in the southern United States, the Caribbean and Hawaii, it is becoming a serious threat to biodiversity not only due to its invasiveness but also because it produces high fuel loads for fires. For the first time, a biological control program is being attempted in Texas. Source populations of the Texan invasion have to be identified in the native range in order to facilitate the search for potential biological control agents. This raises the critical issue of a proper taxonomic identification for this taxon with a history of taxonomic revisions, multiple scenarios of massive introductions and hybridization and polyploidisation events. Guinea grass in the strict sense should refer to *Megathyrsus maximus* (Jacq.), also known as *Panicum maximum* and *Urochloa maxima*. To unravel the taxonomic identification and the evolutionary history of this controversial taxon, we have begun to analyze sequences of two chloroplast regions in modern African and Texan samples as well as historical specimens in the CIRAD collection, some dating back to 1944, prior all extensive improvement programs in Africa. None of the sequences matched the sequence of a voucher specimen of *Megathyrsus maximus* (Jacq.). Results provided evidence of two different maternal lineages, one distributed from eastern Africa to southeastern Africa and Texas that fully matched the sequence of a voucher specimen of *Megathyrsus infestus* (Andersson) and one distributed across western/central Africa and French Guiana that do not belong to *Megathyrsus* genus. Future programs of exploration and collection of natural enemies are to be reviewed in light of these findings.