

Benefits and challenges of pedigree tracking of genetic diversity in ex situ meta-collections of endangered species such as *Amorphophallus titanum*

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Effective management strategies in living collections are even more critical for exceptional plant species that cannot be seed banked. In zoo communities, a pedigree-based approach has been adopted for management of collections. To investigate if this approach is needed for maintaining genetic diversity in botanic gardens, we examined the passive management of *Amorphophallus titanum* (Becc.) Becc. (Araceae). This was identified as a prime species to test the feasibility of using a pedigree-based approach for plants. We aimed to answer three major research questions: (1) How many founders established the current meta-collection of *A. titanum* in botanic gardens? (2) How much genetic diversity, interbreeding, and inbreeding exists in the meta-collection today? (3) How distinct are different continental collection groups, given the presumed lack of exchange between them? Using accession data records from nearly 1,200 individual plants from 113 institutions worldwide, we constructed a pedigree. From this, we concluded that there are few founders, material is rarely exchanged across continents, and nearly a quarter of known crosses are between related individuals. These findings provide important insights to recommend a pedigree-based approach for the management of ex situ plant populations; however, our dataset does contain significant missing data due to the lack of consistent and accurate accession records. Our study highlights a need in the botanic gardens community for a standardized method of recording accession data that utilizes a consistent localized and centralized approach.