

Morphological and molecular diversity of water yam (*Dioscorea alata*) in Brazil

**Marcos V. B. M. Siqueira · Maria L. Bonatelli · Torsten Günther · Inka Gawenda
· Karl J. Schmid · Elizabeth A. Veasey**

Marcos V.B.M. Siqueira · Maria L. Bonatelli

Genetics Department, Luiz de Queiroz College of Agriculture, University of São Paulo,
C.P. 83, 13400-970 Piracicaba, São Paulo, Brazil

Karl J. Schmid · Inka Gawenda · Torsten Günther

Institute of Plant Breeding, Seed Science and Population Genetics, University of
Hohenheim, Fruwirthstrasse 21, 70599 Stuttgart, Germany

Elizabeth A. Veasey (✉)

Genetics Department, Luiz de Queiroz College of Agriculture, University of São Paulo,
C.P. 83, 13400-970 Piracicaba, São Paulo, Brazil

e-mail: eaveasey@esalq.usp.br

Phone: +55 19 34294255

FAX: +55 19 34336706

Abstract Substantial progress was made in the last decade in understanding the diversity in *Dioscorea* species. However, much of the studies so far concentrated in the 'yam belt in Africa', whereas little is known about the status of yams in the other parts of the world. We present a first characterization of the variation among cultivated and local water yams (*Dioscorea alata*) in Brazil using microsatellites to investigate genetic relationships among 73 local varieties and 17 commercial accessions of water yam collected in five different regions in Brazil. Twelve polymorphic microsatellite primers were used to generate DNA profiles for each accession of the species and four morphological traits were analyzed. The morphological characterization showed considerable diversity and no specific clustering was observed between regions. The microsatellite markers had average PIC values of 0.71 and 0.68 for local and commercial varieties, respectively. Analysis of the relationship between accessions did not clearly separate the local and commercial genotypes. However, the molecular analyses of *D. alata* showed a high intraspecific diversity in local varieties from different regions in Brazil. Additionally, we did not observe a strong population structure between sampling regions, only the accessions from the Central-West region showed a higher clustering. These results confirmed an admixture of accessions in all sampling regions, consistent with the lack of a significant correlation between geographic and genetic distances, suggesting that water yam populations have moved extensively. The genetic diversity found can be explained by the result of a continuous exchange of varieties through the Brazilian distribution range.

Keywords Genetic variability · Local varieties · Microsatellites · Morphological traits · Traditional agriculture
