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Genetic Diversity among Pumpkins (*cucurbita* spp) from Selected Production Zones in Uganda and their Resistance to Powdery Mildew Disease

This study was set to evaluate the diversity and resistance to powdery mildew disease among pumpkins in Uganda. Fruits were collected from five production zones in Uganda and subjected to morphological and molecular characterisation, and evaluated for resistance to powdery mildew in a field trial. Results showed considerable variation among the pumpkin accessions in terms of morphological traits, molecular characterisation and resistance to powdery mildew disease. For genetic diversity, multivariate analysis was utilised. The cluster analysis based on morphological characteristics grouped the accessions into two major clusters mainly on the basis of fruit ribs, flesh colour, seed width and secondary skin colour pattern. The matrix plot of eigen vectors for the 10 fruit traits showed a high positive correlation between seed length and seed width, seed width and weight per 10 seeds, primary skin colour and flesh colour, and fruit size and primary colour. Low correlations were recorded between fruit ribs and fruit size, primary skin colour and secondary skin colour, secondary skin colour and seed thickness, seed thickness and weight per 10 seeds, and seed width and fruit size. The UPGMA cluster analysis results from combined SSR and AFLPS data sets showed that accessions were grouped into three clusters according to species for UK pumpkins (controls) and morphological characteristics for Uganda pumpkins. The UK accessions already classified in three species of *C.maxima*, *C.pepo* and *C.moshata* were represented in cluster 1, cluster 2 and cluster three respectively. Two Uganda accessions R2 and N2 clustered with UK accessions TT and OTM (*C. maxima*). The remaining Uganda accessions (18) clustered with the UK accession BT (*C.moshata*). No Uganda accession clustered with UK varieties HD and SS (*C.pepo*) implying that the accessions in the collection of Uganda pumpkins subjected to molecular analysis belonged to only *C.maxima* and *C.moschata* species. In terms of response to the powdery mildew infection, there was great variation ranging from susceptibility to complete resistance. The place of origin played a significant role in disease resistance. All UK pumpkins developed disease symptoms and were more susceptible than local (Uganda) pumpkins. Some Uganda accessions did not develop any disease symptoms. In this report some conclusions and recommendations are made.

Key words: Genetic, Pumpkins, Mildew, Resistance