Morphological Characterization of Sweet Potato [*Ipomoea batatas* (L.) Lam] Accessions

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Sweet potato [*Ipomoea batatas* (L.) Lam] is a widely grown and consumed root crop in Sri Lanka. Sweet potato germplasm maintained at Plant Genetic Resource Centre, Gannoruwa (PGRC) contains 129 sweet potato accessions from different areas of the country. Understanding the genetic diversity of germplasm of crop species is of importance for its rational management and use. Morphological characterisation of germplasm facilitates the identification of duplicates and unique traits and to develop useful core collection. The data will also help in the future improvement endeavours of the crop having with desired characteristics.

The experiment was carried out at the research field of PGRC, Gannoruwa from April to July. Thirty sweet potato accessions along with three recommended check varieties of the Department of Agriculture were used for characterisation. Cuttings were established in an augmented plot design with five blocks. Each accession allocated randomly in blocks without replication and check varieties were allocated to every block randomly. Observations were recorded after the establishment of the crop. Twenty one qualitative (i.e. ground cover, leaf shape, tuber colour etc.) and nine quantitative characters (i.e. leaf length, vine internode length, yield etc.) were measured starting from one month after planting upto harvesting according to the sweet potato descriptors of International Potato Centre. Harvesting was done at 3.5 months after planting. Powdered sweet potato tubers dried at 40°C, was used to analyze starch and total soluble sugar.

The accessions exhibited high morphological diversity in aerial and root characteristics. Analysis of variance showed that out of 30 characters evaluated 29 characters were significantly different ($p<0.05$) between accessions. Leaf length did not show any significant difference. The dendrogram obtained using phenotypic characteristics, separated the accessions into four major clusters with Euclidean distances ranging from 0.00 to 1.25. Cluster 1 contained only 'Ama' a recommended variety and cluster 2 consisted of 8 accessions. Cluster 3 consisted of 14 accessions together with recommended variety 'Gannoruwa Sudu'. Cluster 4 consisted of 8 accessions and all the clusters had sub clusters. Accession BTSP 4 showed the highest yield of 33.07 t ha^{-1}. BTSP 32 contained the highest sugar percentage (29.0%) while BTSP 7 was the lowest (4.7%). Accession BTSP 34 contained the highest starch percentage (97.0%) whereas BTSP 35 was the lowest (19.0%).

Accessions with a high yield (BTSP 2, BTSP 4, BTSP 16, and BTSP 20), high starch content (BTSP 7, BTSP 20, BTSP 27, BTSP 31, BTSP 34) and high total soluble sugar content (BTSP 13, BTSP 25, BTSP 28, BTSP 29) from cluster 2, 3 and 4. Hence, the present study revealed suitable accessions with distant parental lines for hybridization.