

Division-4-03

The Philippines Coconut Genomics Initiatives: Updates and Opportunities for Capacity Building and Genomics Research Collaboration

Hayde Flandez-Galvez^{1*}, Darlon V. Lantican¹, Anand Noel C. Manohar¹, Maria Luz J. Sison¹, Roanne R. Gardoce¹, Barbara L. Caoili¹, Alma O. Canama-Salinas¹, Melvin P. Dancel¹, Romnick A. Latina¹, Cris Q. Cortaga¹, Don Serville R. Reynoso¹, Michelle S. Guerrero¹, Susan M. Rivera², Ernesto E. Emmanuel², Cristeta Cueto², Consorcia E. Reano¹, Ramon L. Rivera², Don Emanuel M. Cardona¹, Edward Cedrick J. Fernandez¹, Robert Patrick M. Cabangbang¹, Maria Salve C. Vasquez¹, Jomari C. Domingo¹, Reina Esther S. Caro¹, Alissa Carol M. Ibarra¹, Frenzee Kroeizha L. Pammit¹, Jen Daine L. Nocum¹, Angelica Kate G. Gumpal¹, Jesmar Cagayan¹, Ronilo M. Bajaro¹, Joseph P. Lagman¹, Cynthia R. Gulay¹, Noe Fernandez-Pozo³, Susan R. Strickler³, Lukas A. Mueller³

¹University of the Philippines Los Baños, College, Laguna, Philippines

²Philippine Coconut Authority (PCA), Quezon City, Philippines

³Boyce Thompson Institute, Ithaca, NY, USA

[Abstract]

Philippines is the second world supplier of coconut by-products. As its first major genomics project, the Philippine Genome Center program for Agriculture (PGC-Agriculture) took the challenge to sequence and assemble the whole coconut genome. The project aims to provide advance genetics tools for our collaborating coconut researchers while taking the opportunity to initiate local capacity. Combination of different NGS platforms was explored and the Philippine ‘Catigan Green Dwarf’ (CATD) variety was selected with the breeders to be the crop’s reference genome. A high quality genome assembly of CATD was generated and used to characterize important genes of coconut towards the development of resilient and outstanding varieties especially for added high-value traits.

The talk will present the significant results of the project as published in various papers including the first report of whole genome sequence of a dwarf coconut variety. Updates will include the challenges hurdled and specific applications such as gene mining for host insect resistance and screening for least damaged coconuts (thus potentially insect resistant varieties). Genome-wide DNA markers as published and genes related to coconut oil qualitative/quantitative traits will also be presented, including initial molecular/biochemical studies that support nutritional and medicinal claims. A web-based genome database is currently built for ease access and wider utility of these genomics tools. Indeed, a major milestone accomplished by the coconut genomics research team, which was facilitated with the all-out government support and strong collaboration among multidisciplinary experts and partnership with advance research institutes.

[Acknowledgement]

Funding agency: Department of Science and Technology - Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD)

*Corresponding author: E-mail, hfgalvez@up.edu.ph Tel. +63 9178957248