Cassava Molecular Breeding and Functional Genomics
-A Research Consortium in Thailand-

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Among starch producing crops, cassava (Manihot esculenta Crantz) has a higher carbohydrate production than others under sub-optimal conditions, more than 160 million tons are produced in the world each year and are used for direct human consumption, animal feed and important raw material for a wide range of industrial goods. Demands on cassava and cassava-derived products in the world are continuously rising. Various cassava varieties are being developed in order to obtain higher productivity as well as starch with desirable properties for industrial applications. A basic knowledge of starch characteristics and storage process is required to improve cassava starch quality and quantity. Therefore, deep insight in cassava development and starch biosynthesis is necessary. Cassava Molecular Biotechnology Research Consortium (CASS-MOL-BIOTECH) was established under the joint research project between Faculty of Science, Mahidol University, National Center for Genetic Engineering and Biotechnology, Ministry of Agriculture and Cooperatives, and several researchers sharing an interest in the cassava variety improvement from other universities. The consortium’s research projects being conducted are categorized into six areas, covers wide aspects of study in cassava, from gene identification, expression analysis, protein structure and enzyme function, genetic manipulation, to marker assisted selection in breeding program, plant pathosystem and system biology. As one of the main suppliers of cassava and cassava-derived products, Thailand stands to benefit the most from basic and applied researches in cassava. The knowledge and technology obtained from this consortium would provide useful information for the varietal improvement of cassava with high storage root yield, high starch quantity and consistent quality. Since the consortium is operated in close consultation with the Thailand Department of Agriculture and various industrial sectors, it is expected that the work will not only benefit those working in academic and agricultural fields but also to those in the industrial area. The starch with novel properties could also open the door for other industrial uses not applicable at present. Recently, the CASS-MOL-BIOTECH consortium has started international collaborative research project with RIKEN-PSC-Japan and CIAT-Colombia on establishment of cassava functional genomics platform for the global cassava research community to advance cassava molecular breeding. It is critical for policy-makers, the research community, and donors to understand the challenges and opportunities of developing this crop for the future. The regional cooperation should help in clearly defining the target problems and challenges to rise up to the expectations of stake holders.

Selected References: