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Towards production of novel traits from oil palm via genetic modification

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Abstract

Palm oil is the major source of vegetable oil in the world and Malaysia is the largest producer of palm oil in the world. The major problems faced by the oil palm industry are shortages of labor and arable land. One option to sustain the palm oil industry is through increased productivity. Genetic engineering has been identified as a promising technology to further increase productivity per unit area and add value to the crop producing novel products. Genetic engineering research at MPOB was initiated as early as in 1987.The first successful production of fertile transgenic oil palm was obtained ten years later. This was followed by concurrent efforts to isolate many targeted genes and tissue-specific promoters from oil palm. Among the targets for genetic engineering of oil palm are increasing oleic and stearic acid contents in palm oil and synthesizing novel environmentally-friendly biodegradable plastics. Construction of transformation vectors carrying Basta as the selectable marker and different genes and promoters in both sense and antisense orientation for targeted products has been successfully achieved. Transformation of oil palm target tissues with the above constructs produced Basta resistant colonies which were later regenerated to produce full-grown transgenic palms. Some transgenic palms have been transferred onto soil in contained greenhouse. Molecular and fatty acid analyses of the oil palm tissues and plantlets are being carried out for proof of concept. Serious laboratory and screenhouse experiments are being conducted. Latest progress in this area of research will be elaborated.

Biography

Ahmad Parveez Ghulam Kadir has completed his Ph.D in Plant Genetic Engineering from University Putra Malaysia in 1998. He is the Head of Functional Biotechnology Unit at the Advanced Biotechnology and Breeding Centre, MPOB. He is also the Chairman of Genetic Modification Advisory Committee (GMAC) under the National Biosafety Board since May 2010. He has published more than 40 papers in refereed journals and almost 100 non-refereed publications. He has become external examiner for many PhD and MSc theses. He received the National Young Scientist Award in 2001 and National Level Employee of the Year in 2007.