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Oil palm genome sequence: Applications for crop improvement

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Oil palm is the most productive vegetable oil crop contributing significantly to the increasing demand for oils and fats by the world's growing population. Research and development (R&D) efforts in the area of oil palm genomics was initiated to help improve breeding efficiency. The efforts received a boost when the oil palm genespace was sequenced in 2004 using the GeneThresher™ methylation filtration technique which focused on sequencing the hypo methylated regions of the oil palm. Single Nucleotide Polymorphism (SNP) markers were mined from these sequences and used to construct high density genetic maps for oil palm. Subsequent to this, the genomes of *Elaeis guineensis* and *Elaeis oleifera* were sequenced at high coverage using a combination of 454/Roche technology and BAC end sequencing. The genetic maps constructed previously were used to align and orientate the sequence scaffolds. The main aim was to use the high quality sequence assembly to identify genes influencing important agronomic traits. In this respect, the Shell gene responsible for the three different fruit forms of oil palm was uncovered and has important implications increasing palm oil yield as well as improving breeding efficiency. Expanding on this, the gene influencing the exocarp colour of oil palm fruits was also identified and will be useful in improving harvesting practices and subsequently oil yield. However, to uncover the complexities and diverse physiological processes in the oil palm, an integrative "omics" approach which complements genome knowledge with proteomics and metabolomics datais also being actively exploited.

Biography

Rajinder Singh is currently a Principal Research Officer at the Malaysian Palm Oil Board. He has been with the Malaysian Palm Oil Board for the last 18 years. He holds a PhD in Plant Genetics and is currently the Head of Genomics Unit of the Advanced Biotechnology & Breeding Centre at the Malaysian Palm Oil Board (MPOB). He has authored and co-authored more than 30 refereed publications.

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