



The First Genetic Map and Positions of Major Fruit Trait Loci of Bitter Melon (*Momordica charantia*)

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Abstract

Albeit extensive cultivation of bitter melon both as vegetable and medicine in many countries of Asia, Africa, and South America, no serious efforts have been made for genetic and breeding studies on this 'orphan' crop. In contrast to popular cucurbits, it lacks a genetic linkage map as required for genomic depiction and precise breeding. We report here on the construction of the first genetic linkage map of bitter melon using a set of 146 F₂ progenies derived from an inter-botanical variety cross between Taiwan White, *Momordica charantia* var. *charantia*, and CBM12, *M. charantia* var. *muricata*. This map consists of 108 AFLP markers and five qualitative trait loci dispersed over 11 linkage groups spanning a total distance of 3060.7 cM. The five qualitative traits mapped include fruit color, fruit luster, fruit surface structure, stigma color, and seed color; all of which exhibited monogenic segregation except seed color which showed digenic (9:7) mode of inheritance. Besides, twelve quantitative trait loci (QTL) controlling five polygenic fruit traits including length, diameter, weight, number, and yield were

detected on five linkage groups that individually explained 11.1 to 39.7% of the corresponding total phenotypic variance. This map will be useful in marker-assisted breeding of these fruit traits and future mapping of genes/QTLs controlling phytochemicals content exhibiting contrasting variation between the parents.

Biography: Prof. Chittaranjan Kole is an internationally renowned scientist with a spectacular professional career spanning over 35 years. His life-time and original scientific contributions, specifically in the fields of Genomics, Biotechnology, Climate Change and Biodiversity, to name a few, have been globally appreciated, leading to the Outstanding Crop Scientist Award, which was conferred on him by the International Crop Science Society in 2012. During this exceptional career, Prof. Kole has developed a large number of original concepts and strategies, which have contributed enormously to science and benefited the global society. His scholarly publications include 150-plus research articles, most of which were published in the peer-reviewed international journals, 20 book chapters, and over 100 books with globally-reputed publishers.