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Hot Pepper Genome: Basic Genetic Tools for Molecular BreedingByoung Cheorl Kang¹, Seok Hyeon Nahm¹, Jin Hoe Huh¹, Je Min Lee¹,
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Pepper fruits are consumed as food additives for their unique color, pungency, and aroma in many regions of the world, particularly in Asia and South and Central America. Five species of *Capsicum* peppers, including *C. annuum*, *C. chinense*, *C. baccatum*, *C. frutescens* and *C. pubescens*, are cultivated in different parts of the world. Among them *C. annuum* is most widely grown in both Asia and worldwide. It includes most of the Mexican chile peppers, most of the hot peppers of Africa and Asia, and various cultivars of sweet peppers grown in temperate regions of Europe and North America.

During the last decade, the construction of molecular linkage map has become an essential tool for plant molecular genetics and breeding research. Despite the pepper genome research is being conducted by only a small number of research groups worldwide, development of a linkage map in *Capsicum* has been greatly aided by use of tomato-derived RFLP probes.

We have constructed a molecular linkage map of pepper (*Capsicum* spp.) in an interspecific F₂ population of 107 plants with 150 RFLP and 430 AFLP markers. The resulting linkage map consists of 11 large (206 - 60.3 cM) and 5 small (32.6 - 10.3 cM) linkage groups covering 1,320 cM with an average map distance between framework markers of 7.5 cM. Most (80%) of the RFLP markers were pepper-derived clones and these markers were evenly distributed across the genome. By using 30 primer combinations, 444 AFLP markers were

generated in the F2 population. The majority of the AFLP markers clustered in each linkage group, although *Pst*I/*Mse*I markers were more evenly distributed than *Eco*RI/*Mse*I markers within the linkage groups. We have developed SSR markers and these markers were informative for pepper genome research. Genes for biosynthesis of carotenoids and capsaicinoids were mapped on our linkage map. This map will provide the basis of studying secondary metabolites in pepper.