

Soontree Hanyong 2012: Genetic Diversity of Chilli Germplasm as Revealed by Microsatellite Analysis. Master of Science (Agriculture), Major Field: Horticulture, Department of Horticulture. Thesis Advisor: Associate Professor Orarat Mongkolporn, Ph.D. 119 pages.

Chilli is the world economically important vegetable and spice. The Tropical Vegetable Research Center, Kasetsart University, Kamphaeng Saen Campus has collected chilli germplasm greater than 2,000 accessions. To have an efficient germplasm management and to reduce cost of germplasm maintenance, a core collection should be established. Therefore, the study was aimed to investigate the genetic diversity of the chilli germplasm using microsatellites. Ten anchored microsatellites were used to evaluate 230 chilli germplasm accessions. Forty two alleles were generated with size ranging from 87 to 323 basepair. The average Expected Heterozygosity ( $H_e$ ) value was 0.62 ranging from 0.473-0.714, average Polymorphism Information Content (PIC) value was 0.57 ranging from 0.414-0.681 and Probability of Identity (PI) from 0.17-0.49. The combined PI of the ten microsatellite loci was  $2.30 \times 10^{-6}$ . Similarity Index (SI) ranged from 0.18 to 1.00. The 230 chilli accessions were divided into two major groups. Group I comprised mainly *C. annuum*, and group II comprised other *Capsicum* species including *C. frutescens*, *C. chinense* and *C. baccatum*. Matrix comparison showed that the cophenetic correlation of 0.81 indicating the best fit of the obtained dendrogram. PowerCore program was used to select representative chilli accession to form a core collection. Twenty eight chilli accessions were selected, which maintained similar level of diversity as of the total 230 accessions.

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Student's signature

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Thesis Advisor's signature