

Nichawan Raechiangsan 2006: Evolutionary Relationship of *Zamia* Using Random Amplified Polymorphic DNA (RAPD). Master of Science (Cell and Molecular Biology), Major Field: Cell and Molecular Biology, Department of General Science. Thesis Advisor: Associate Professor Mingkwan Mingmuang, Ph.D. 148 pages.
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RAPD and morphological characteristics were used to evaluate genetic similarity among thirty species of cycad genus *Zamia* generally distributed in the North, Central and South America. These *Zamia* are collectively grown at Nongnooch Tropical Garden, Chonburi province, Thailand.

Twelve out of sixty primers i.e., OPA-18, OPB-06, OPB-07, OPB-08, OPB-10, OPB-12, OPB-15, OPJ-04, OPJ-13, OPJ-15, OPJ-19 and OPJ-20 could produce polymorphic and specific band patterns to identify the thirty *Zamia* species. These primers generated 263 reproducible bands at the size of 0.15 - 2.70 kb. Polymorphism of the DNA profiles appraised by NTSYS program gave the similarity coefficient in the range of 0.66-0.87. Phylogenetic tree was constructed and these *Zamia* were grouped into six clusters. There are some group corresponded well to the morphological characters as well as to their geographic distribution. However, when considering only eight primers i.e., OPA-18, OPB-06, OPB-08, OPB-10, OPB-12, OPJ-13, OPJ-15 and OPJ-20 which gave distinctive bands patterns of *Zamia* species. The total of 165 bands at the size of 0.15 - 2.50 kb giving similarity coefficient in the range of 0.63 – 0.88 were obtained. The resulted phylogenetic tree also grouped these thirty *Zamia* species into six clusters and they corresponded well to the morphological characters as well as to their geographic distribution.

PCA (Principal Component Analysis) was used for cluster analysis based on specific band patterns of twelve and eight primers. PCA data of dotted distribution was constructed and all thirty *Zamia* species were grouped into six clusters which corresponded well to the NTSYS program.

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