Natthaphichamon Udomphot 2008: Intraspecific Relationships among *Cycas* Species Using Chloroplast DNA Compared to Morphological Characteristics and Geographic Distribution. Master of Science (Cell and Molecular Biology), Major Field: Cell and Molecular Biology, Department of Eart Sciences. Thesis Advisor: Associate Professor Mingkwan Mingmuang, Ph.D. 120 pages.

Twenty-two species of *Cycas*, naturally distributed in Asia and Australia were collectively grown at NongNooch Garden, Chonburi Province. They were comparatively identified based on their morphology and the difference in chloroplast DNA. Using 5 different primers to find the differences in nucleotide sequence of these *Cycas*, only one primer, i.e., psbM^{F}-trnD^{GUCR}, could positively classify them showing 969 to 984 nucleotide base pair long. The mean base composition of psbM^{F}-trnD^{GUCR} intergenic spacer among these 22 *Cycas* were 0.341 (A) 0.286 (T) 0.205 (G) and 0.168 (C). The G/C content was found ranging from 34.9-38.6%. Changing of nucleotides came in the forms of transitions/transversions and insertion/deletion giving the average ratio of transition/transversion (Ts/Tv) of 1.406. In addition, *Cycas* from Australia, i.e., *C. xipholepis, C. cairnsiana, C. angulata* and *C. campestris* had guanine addition at position 633 and deletion of guanine and thymine at positions 450 and 481, respectively. Moreover, *Cycas* from Vietnam, i.e., *C. balansae, C. collina, C. branchycantha* and *C. dolichophylla* had guanine addition at different position from 721 to 725 basepair. Phylogenetic relations were drawn based on Mega version 4.0 using "maximum parsimony" and "neighbour-joining" methods. The former method classified the 22 species of *Cycas* into 2 groups and 6 subgroups while the latter made them into 2 groups and 4 subgroups Twenty-four out of 37 morphological characteristics, mostly in the forms of stem, leaf, seed, male and female cone, supported their genetic identification and also agreed with their natural geographic distribution.

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