ABSTRACT

Cyathea sinuata Hook. & Grev. and *Cyathea hookeri* Thw. and their suspected hybrid are co-occurring to each other and continue and share the characters among them. Except morphological description, information on their taxonomy, distribution, morphological and genetic variation, ecology, reproductive biology and cytology is scanty. The objective of this study was to initiate a systematic study on of theses three co-occurring taxa of the genus *Cyathea* at Sinharaja and Kannelliya forests. Fifty-three samples were evaluated based on 25 morphological characters and ecological requirements were measured at the field using standard techniques. Reproductive biology, cytology and molecular work were conducted at the laboratory during the three years period.

Morphological characterization of three taxa explained the variation of each taxa within their natural habitats. Both Principal Component Analysis and cluster analysis revealed that three distinguished clusters which are resemble to *C. sinuata*, *C. hookeri* and their hybrid. Two morphotypes of *C. sinuata* was identified. Results revealed that intermediate position of hybrid and confirmed their parentage as *C. sinuata* and *C. hookeri* using morphological characters. All taxa are clustered in close vicinity to each other and limited to few isolated pockets along the stream side bank. Only *C. sinuata* distributed substantial population in its locality. Both parents and hybrids were often terrestrial. Light level, canopy density and moisture of immediate vicinity directly affected on their population distribution. Soil characters were not a major factor to

determinant population of each taxa. Reproductive biology of three taxa were similar in terms of spore germination, gametophyte and sex organ development. However, the hybrid did not produce the sporophyte indicating it may be sterile. Both parents and the hybrid were cytologically similar with meiotic chromosomes of n=69. DNA extraction protocol for both parents and hybrid were optimized.