

Genetic variation and genetic differentiation in three species of *Dryobalanops* in Sarawak

Ko HARADA^{1*}, Shoko HATAYA¹, Tomoya ARAKI², Bibian DIWAY³, Joseph Jawa KENDAWANG⁴, Lucy CHONG³

¹Faculty of Agriculture, Ehime University, Japan

²Gunma Prefecture

³Forest Research Centre, Sarawak

⁴Sarawak Forestry Cooperation

Dryobalanops is one of the most important tree species in Borneo as timbers as well as main canopy forming trees. We collected leaf samples of *Dryobalanops* species including *D. aromatica* from Lambir Hills National Park (21), Similajau National Park (21), *D. beccarii* from Sibü (22), Batang Ai (24), Bako (28), Kuba (11) and Gunung Gading (21) and *D. lanceolata* from Lambir Hills National Park (10), Niah (7), Sibü (14) and Kapit (4). DNA was extracted from these samples and analyzed for sequences in non-coding regions of the chloroplast *trnT-L* spacer, *trnL* intron, *trnL-F* spacer, *trnH-K* spacer and *trnH-K* spacer covering a total of 2122bp. Eighteen nucleotide substitutions and three indels were found in *D. lanceolata* resulting 16 haplotypes, whereas, 10 nucleotide substitutions and six indels were found in the closely related species group of *D. aromatica* and *D. beccarii* resulting 15 haplotypes. One substitution (at no. 984 in *trnT-L* spacer) was fixed with T in *D. aromatica*, and G in *D. beccarii*. The result is summarized in Table 1.

Table 1 Genetic variation in five chloroplast non-coding regions of three *Dryobalanops* species.

	<i>D. lanceolata</i>	<i>D. aromatica</i>	<i>D. beccarii</i>
No. Nucleotide substitutions	18	2	7
No. Indels	3	2	4
No. Haplotype	16	5	10

This shows the largest genetic variation in *D. lanceolata* among the three species and the smallest in *D. aromatica*. Minimum spanning network was constructed for these haplotypes and shown in Fig. 1. This shows that the haplotypes in *D. beccarii* were differentiated in central Sarawak (Sibü and Batang Ai) and western Sarawak (Bako, Kubah and Gunung Gading). Furthermore, *D. lanceolata* and *D. beccarii* shared three common haplotypes in central Sarawak. This suggests an ancestral polymorphism in *D. lanceolata* and *D. beccarii*, and central Sarawak is the possible centre of speciation of *Dryobalanops* at least for these three species.

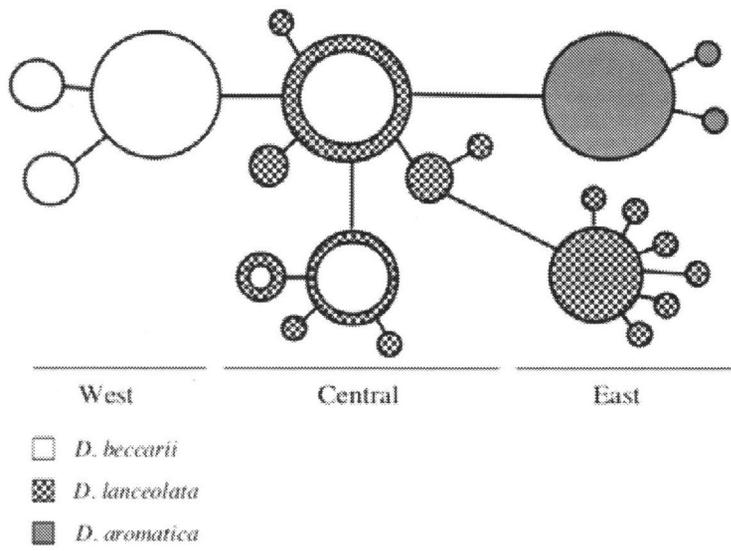


Fig. 1 Minimum spanning network showing genetic relationship among the haplotypes identified in three *Dryobalanops* species.