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## Complete chloroplast genome sequences of cacao (*Theobroma cacao* L.) useful for phylogenetic analysis and DNA barcoding

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Cacao (*Theobroma cacao* L.) is known as main material for chocolate industry worldwide. Indonesia is recognized as the third largest cacao producer in the world with the total production in 2014 reached 709.331 tonnes. In order to understand cacao genomic, we conducted chloroplast genome sequencing generated by an Illumina Miseq platform. Chloroplast plays a crucial role in sustaining life on earth. The availability of chloroplast sequences could enhanced our understanding of chloroplast biology, conservation, diversity, and the genetic basis by which chloroplast transgenes can be engineered to enhance plant agronomic traits. The size of chloroplast genomes of cacao ranged from 160,619 bp to 160,649 bp. Cacao chloroplast sequences encoded 114 genes, consisted of 80 protein coding genes, 30 tRNA genes and four rRNAs genes. Based on chloroplast sequences, we conducted phylogenetic analysis of 12 cacao genotypes that successfully separated bulk and fine types. The dendrogram resulted in this study proved the utility of chloroplast sequences for phylogenetic analysis. Some variations demonstrated through the number and structure of repetitive sequence in cacao chloroplast sequences. Identification of repetitive sequence by REPuter program exhibited that cacao possessed 18 repeats and three repeat structures (forward, palindrome and reverse). In addition, we have developed three indel-based barcode markers which were designed based on the polymorphic regions of *trnK-UUU-rps16*, *rps16* intron and *trnA-UGC-rrn23*. The result obtained herein would give new insight regarding chloroplast genome structure in cacao, which would be useful to resolve phylogenetic relationships and development of DNA barcode markers.

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