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Description: Controlled hybridization provides a pathway to improving bean quality and genetic variation in cacao. This study comprises phenotypic variations in F1 progeny and molecular characterization using 11 polymorphic markers. The F1 hybrid TSH858 x DR1 emerged with the higher average pod weight, bean counts, the highest single dried bean weight, and lowest pod index. Molecular characterization revealed the highest observed and expected heterozygosity confirming the origins of hybrids. Distinct genetic relationship among the cacao F1 progenies suggested that bean yield and quality were associated with genetic variation. Information regarding molecular characterization with morphological variations in cacao pod traits can be found in the research manuscript of Izzah *et al.* (2025). Izzah NK, Tresniawati C, Rubiyo R, Pranowo D, Randriani E, Firdaus NK, Amaria W, Sasmita KD, Puspitasari M, Susilawati S, Aunillah A, Tarigan EB (2025). Molecular characterization of the cacao F1 populations with morphological variations in pod traits. *SABRAO J. Breed. Genet.* 57(6): 2275-2285. <http://doi.org/10.54910/sabrao2025.57.6.3>.

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