

KERAGAMAN GENETIK INDUK DAN SEMAI CENDANA (*Santalum album* Linn.) RASLAHAN GIRING ZONA TENGAH GUNUNG SEWU

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INTISARI

Keberadaan raslahan cendana di Gunung Sewu menjadi salah satu prospek yang menjanjikan sebagai alternatif sumber materi genetik. Karena sejarah pembentukan tiap zona berbeda, maka lanskap yang terbentuk juga berbeda-beda. Hal ini menjadikan struktur genetik dan struktur populasi ras lahan cendana di Gunung Sewu sangat beragam. Di Zona Tengah Gunung Sewu, bagian perbatasan Formasi Sambipitu dengan Formasi Wonosari-Punung terbentuk dari peristiwa patahan di masa lalu, yang menghasilkan lanskap jurang dan gua saat ini. Di antara zona di Gunung Sewu, lokasi perbatasan ini penting, karena hanya terdapat tiga raslahan cendana, dengan dua di antaranya telah mengalami degenerasi. Satu-satunya raslahan yang belum diteliti di perbatasan Formasi Sambipitu dengan Wonosari-Punung ini adalah raslahan Giring. Penelitian ini dilakukan untuk mengetahui keragaman genetik temporal (induk dan semai) cendana di raslahan Giring pada periode pembungaan tahun 2022.

Lokasi penelitian terletak di raslahan cendana Giring, Desa Giring, Paliyan, Gunungkidul yang termasuk salah satu raslahan di perbatasan Formasi Sambipitu dengan Wonosari-Punung, di Zona Tengah Gunung Sewu. Tahapan yang dilakukan yaitu (1) inventarisasi dan pemetaan individu dewasa dan semai cendana; (2) penghitungan tingkat klonalitas; (3) penghitungan proporsi induk berbunga; (4) pengambilan sampel untuk analisis isozim; (5) analisis isozim dengan *electrophoresis gel polyacrilamide*; dan (6) interpretasi pola berkas.

Hasil penelitian menunjukkan bahwa total individu dewasa cendana di Raslahan Giring berjumlah 1110 individu, dengan 42 individu di antaranya sedang berbunga dan berbuah, sehingga diperoleh nilai proporsi individu berbunga sebesar 23,60%. Sejumlah 114 individu berasal dari pembiakan generatif, dan 996 individu klon, sehingga persentase klonalitas sebesar 89,73%. Nilai N_e (rerata jumlah alel efektif) berkisar antara 1,687 hingga 2,577 dengan rerata 2,572. Induk berbunga di Raslahan Giring memiliki nilai rerata H_e sebesar 0,510; rerata H_o sebesar 0,618; dan rerata F_{IS} sebesar -0,209. Nilai keragaman ini hampir sama dengan keragaman individu dewasa (total) yang memiliki nilai rerata H_e sebesar 0,507; rerata H_o sebesar 0,614; dan rerata F_{IS} sebesar -0,227. Semai memiliki nilai rerata H_e 0,508; rerata H_o 0,595; dan F_{IS} -0,196. Di Raslahan Giring, nilai F_{IS} negatif pada fase induk maupun semai, menunjukkan bahwa perkawinan *outcrossing* masih terjadi pada kedua fase tersebut. Raslahan ini juga masih dapat mempertahankan alel yang telah langka atau hilang dari kedua raslahan lainnya di zona ini.

Kata kunci : Keragaman genetik, Cendana, Raslahan Giring, Gunung Sewu

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THE GENETIC DIVERSITY OF PARENT TREES AND SEEDLINGS OF SANDALWOOD (*Santalum album* Linn.) GIRING LANDRACE THE CENTER ZONE OF GUNUNG SEWU

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ABSTRACT

The existence of sandalwood landraces in Gunung Sewu is promising for alternative sources of genetic materials. In Gunung Sewu, landscapes varied with the differences on the formation history of each zone. It reflects to the differences on genetic and population structures of the sandalwood landraces in Gunung Sewu. In Central Zone of Gunung Sewu, the part in the borderline of the Sambipitu Formation and the Wonosari-Punung Formation was constructed from the uplift and downlift formation in the past, resulted in the recent cliffs and caves landscapes. Among zones in Gunung Sewu, this part is important since it only consisted of three sandalwood landraces, in which two of them have been degenerated. The only race that has not been studied at the borderline zone is the Giring landrace. Therefore, this research was conducted to determine the temporal genetic diversity (parent and seedling) of sandalwood in the Giring race in the 2022 flowering period.

The research site located in the sandalwood landrace area of Giring, Giring Village, Paliyan, Gunungkidul which is one of the landraces on the border of the Sambipitu Formation and Wonosari-Punung, in the Center Zone of Gunung Sewu. The steps taken were (1) inventory and mapping of sandalwood parent trees and seedlings; (2) calculating the level of clonality; (3) calculating the proportion of flowering broodstock; (4) sampling for isozyme analysis; (5) isozyme analysis using polyacrylamide gel electrophoresis; (6) banding pattern interpretation.

The results showed that the total number of sandalwood adult individuals in Giring landrace was 1110 individuals, 42 of which were in the flowering and fruiting phase with the proportion of flowering individuals (total) of 23,60%. A total of 114 individuals came from generative propagation, and 996 individuals were clones, so that the percentage of clonality was 89,73%. The N_e value (mean number of effective alleles) ranged from 1,687 to 2,577 with the average is 2,572. Flowering parents in Giring landrace has an average H_e of 0,510; the average H_o is 0,618; and the average F_{IS} is -0,209. The value of this diversity is almost the same as the diversity of adult individuals (total) which has a mean H_e of 0,507; the average H_o is 0,614; and the mean F_{IS} is -0,227. Seedlings have a mean H_e of 0,508; mean H_o is 0,595; and F_{IS} is -0,196. In Raslahan Giring, the F_{IS} was negative in both parent and seedling phases, indicating that outcrossing mating still occurred in both phases. Giring landrace still keeps the allele that were already rare and missing from the two other landraces.

Keywords : *Genetic diversity, Sandalwood, Giring landrace, Gunung Sewu*

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