

Name	Counterpart	Title
Iskandar Z. Siregar, Sri Rahayu, Ulfah Juniarti Siregar, Essy Harnelly, Fifi Gus Dwiyanti, Bambang Irawan, Muhammad Majiidu	B14	Genetic diversity of sungkai (<i>Peronema canescens</i> Jack.) and jengkol (<i>Archidendron pauciflorum</i> Benth.) in EFForTS-BEE assessed by microsatellite markers

Research summary

The success of ecosystem restoration through a variety of planting activities can be affected by several factors, one of which is the seed origin. The genetic diversity of seeds needs to be examined which is crucial to determine the success rate of the plantation. Jalonen *et al.* (2017) suggested that about 40% of reproductive materials of forest plants originated from fragmented populations with unwarranted quality. Therefore, high-quality Jengkol seedlings and Sungkai clones are needed with an adequate genetic base to increase the success rate of ecosystem restoration. The study has planted the seedlings (Jengkol) and clones (Sungkai) in Bogor and maintenance is being carried out regularly. On the other hand, microsatellite loci for both species were identified from the previous year, but the diversity analysis has not been conducted yet based on the representative number of samples. It is always desired that capacity to perform genetic analysis locally is available in Indonesia. The current CRC 990 project still uses mainly Sanger DNA Sequencer (ABI) for DNA analysis. Good handling (management and operation) of such a machine in Göttingen is an important experience and lesson to be learned and transferred to Indonesia since IPB has the machine located in the Advanced Research Laboratory (<https://advancedlab.ipb.ac.id/en/equipment/genetic-analyzer-abi-3500>). However, due to a lack of trained technicians, the utilization of the machine is not yet optimally performed. This project aimed to improve the capacity for conducting analysis of the genetic diversity of Jengkol and Sungkai originating from EFForTS-BEE experimental plots using microsatellite markers generated using ABI sequencing machine. In addition, it was aimed to train one technician from IPB to get familiar with the “tip and tricks” in handling the ABI sequencing machine (i.e., consumables, management, and operation)



Picture 1. Jengkol progeny trial in Forest Areas with Special Purposes, Parung Panjang, Bogor.



Picture 2. Sungkai clonal trial in Forest Park, IPB Dramaga Campus.

A technician from IPB was trained in Göttingen for one month, while also conducting the microsatellite analysis for 20 single tree progenies of Sungkai and 20 single clonal ramets of Jengkoi. Preparation for the training was conducted through virtual meetings as necessary before the technician is going to Germany.

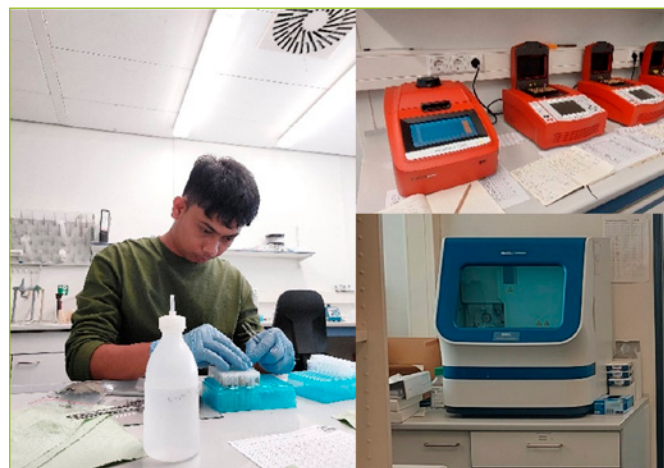
Maintenance of seedlings and clones was done in the progeny trial (Jengkoi) located in Parung Panjang and the clonal trial (Sungkai) in IPB Darmaga campus.

The growth performance of the two species is presented in **Pictures 1 and 2**. Vegetative and generative materials of Jengkoi and Sungkai were collected from Biodiversity Enrichment Experiment (BEE) plots, PT Humusindo, Jambi.

Currently, the trials are being monitored to determine their growth and survival. In addition, the trials are also used as a showcase of using planting stocks from BEE-EFForTS plots.

References

Jalonen R, Valette M, Boshier D, Duminil J, Thomas E (2017) Forest and landscape restoration severely constrained by a lack of attention to the quantity and quality of tree seed: insights from a global survey. *Conservation Letters* 4:27



Picture 3. One of IPB junior staff went to the University of Göttingen to conduct training on handling the ABI sequencing machine from the 21st of September to the 6th of October 2022. During the training, the IPB staff did a microsatellite analysis using Jengkoi and Sungkai species from Biodiversity Enrichment Experiment plots (BEE-EFForTS). Five primer candidates from previous work were used to analyze microsatellites for each species. The results showed that only one of five primer candidates works for SSR analysis of Jengkoi. On the other hand, five primer candidates worked well for SSR analysis of Sungkai. During the training, the IPB staff also had the experience to join the Future PhD for Future Forest (F4) Symposium at the Faculty of Genetics and Tree Breeding, University of Göttingen.



Picture 4. Future PhD for Future Forest (F4) Symposium in Buisgenweg 2, 28-30 September 2022