Sri Rahayu, Iskandar Z. Siregar, Ulfah Juniarti Siregar, Essy Harnelly, Fifi Gus Dwiyanti, Bambang Irawan, Muhammad Majiidu	**B14**	Assessment of FRM quality produced from seeds (*Archidendron pauciflorum* Benth.) and clone (*Peronema canescens* Jack.)

Background and Objective

The term forest reproductive material, or FRM, encompasses seeds, plant parts (e. g., cuttings and scions) and plants grown using seeds or plants parts, including plants propagated in vitro (FAO, 2021a,b). FRM from jengkol are seeds from specific mother trees, while for sungkai are ramets (clones) for specific ortets. The asexual reproduction system has a higher risk due to decreasing genetic diversity, which needs to be considered when mass-producing FRM. Multiple provenances from difference sources assumed to reduce risks (Konnert *et al*., 2015). The potential of FRM utilization in the *EFForTS-BEE* has not yet been evaluated considering future demands for quality seeds and clones in the near vicinity. This study aims to assess the quality of FRM regenerated from jengkol seeds and sungkai clones.

Methods

The fruits or seeds of jengkol were collected during fruiting seasons (August) and tested according to the protocol for seed testing (Sudrajat *et al.*, 2021). The activity includes the following steps: i) seed extraction, ii) measurement of seed physical properties (weight, moisture content), iii) measurement of seed germination parameters, and iv) seedling maintenance and seedling quality assessment. On the other hand, vegetative material that can be collected at any time (e. g., 15–20 cm cuttings) was used for testing sungkai clones. The activity consists of the following steps: i) cutting preparation, ii) plant media preparation in polybag, iii) treatment with rooting hormones, iv) maintenance of rooted cuttings, and v) evaluation of seedling quality (Sumiasri & Priadi, 2003)

Results and Conclusion

FRM from seed (sexual reproduction) – represented by jengkol fruit

Firstly, we measure the fruit weight and size to differentiate each accession from each tree source. The fruit weight is presented at the figure 1.

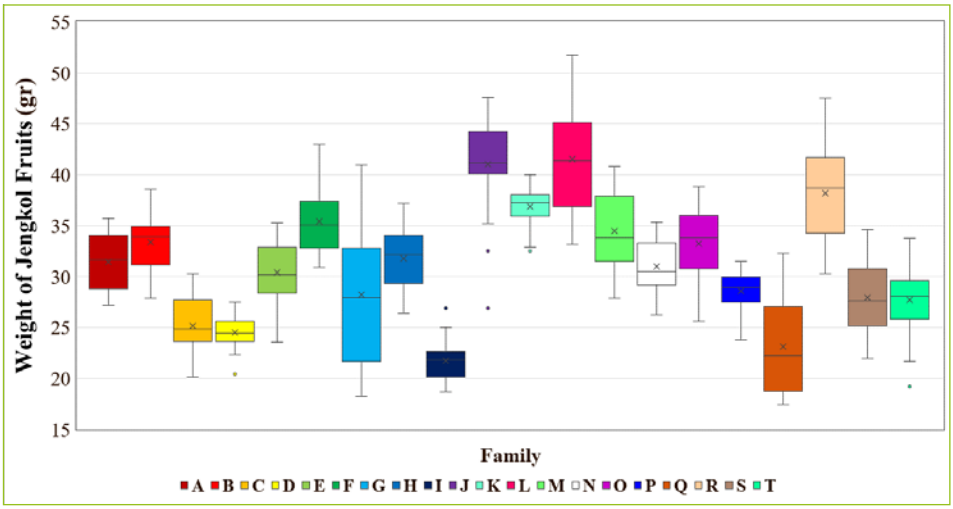

Figure 1. Variability of jengkol fruit weight.

The range of fruit weight is quite wide, ranging from 18 to 45 gr on average for each accession. We also noted skin color as an indication of fruit maturity. We have difficulty collecting enough samples at sufficient and uniform maturity since they are not available at the location. The fruit of Jengkol at the location was also consumed by squirrel and monkeys, which was very difficult to manage. We collected jengkol fruit as ripe as possible from each accession. The outer skin of the ripe jengkol fruit is dark brown, while the younger fruit has a green skin. Some of the fruits still had some green color on the dark brown skin. The lower weight (Fig. 1) also represented from the young (not ripe) fruit having a green skin. Every accession also had a different growth rate as shown in figure 2.

According to figure 2, acc. K, L, M, and Q have good seedling growth, while acc. G, E, and I have very slow seedling growth and mostly fail to germinate. This correlated with the weight and maturity of jengkol fruit/seeds, which are shown in figure 1. Fruit weight may be a response to the genetic traits of each accession, which will be seen from the genetic analyses. Fruits of acc. G, E, and I were mostly not mature enough for germination, as indicated by the green color of the outer skin and less fruit weight (Fig. 1). In general, each individual has a different genetic background, as indicated by the shape, color, and size of the jengkol fruits. We made comparison between skinned and non-skinned seeds (still with the hard shell). Skin removal was performed on the mature seed and accelerate the seed germination as shown in figure 3 (the orange line).

The jengkol fruit has a hard, non-edible skin. The skin is removed for seed consumption, but usually the skin is retained for the seed germination. People in Sumatra and Jambi were not used to germinating jengkol seeds, and the jengkol tree grew spontaneously in the garden/orchard. Sometime, when they need to plant jengkol fruits, they just collect the spontaneously germinated fruit near the mother tree. Recently, as the demand for jengkol fruit increased, the germination of jengkol seed increased without removing the fruit skin. The gap between skinned and non-skinned was quite long, about 3-4 weeks.

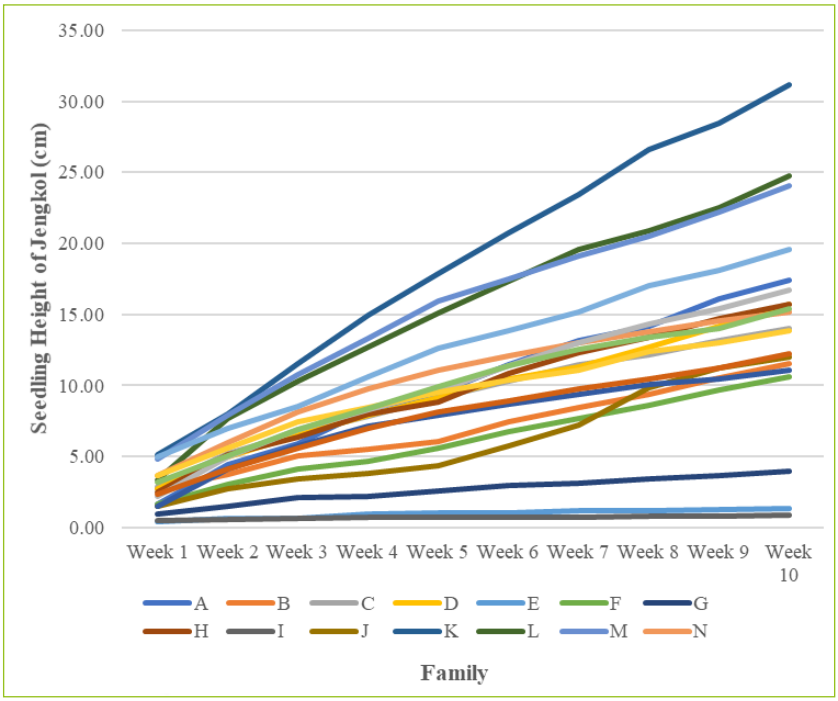

Figure 2. Growth of jengkol seedlings according to accession.

Figure 3. Growth of jengkol seedling (orange line is removed skin, blue line no removed skin).

FRM from clone (asexual reproduction) – represented by sungkai cuttings

The sample size was 21 clones which have different stem size diameter. The results is shown in figure 4.

Six clones showed good growth, that are acc. H, K, M, L, S, and P. Growth performance seems to correlated with cutting size, particularly from the stem diameter. The acc. H. K. M have larger stem diameter for cuttings. The correlation between growth performance, cutting size and genetic diversity of each clones is determined from molecular marker analyses.

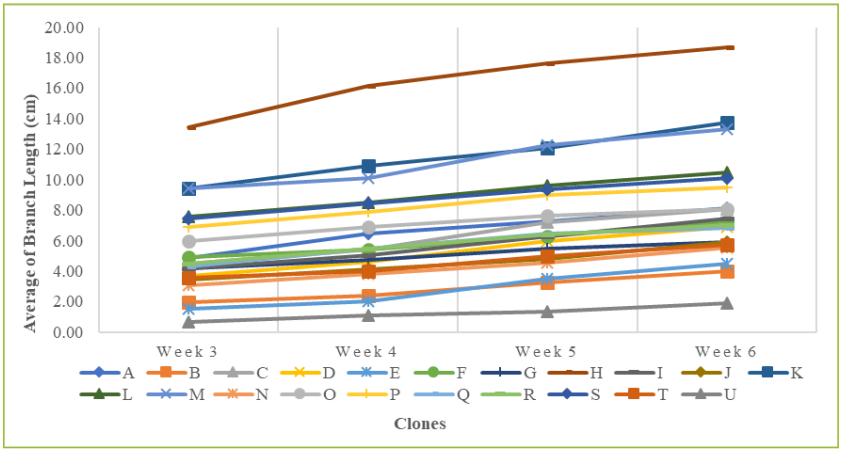

Figure 4. Growth of 21 clones of sungkai.

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