INTISARI

Merbau (*Intsia bijuga* Colebr O. Kuntze) merupakan jenis endemik yang mulai langka dan perlu upaya konkrit dalam meminimalisir eksploitasinya yang berlebihan. Salah satu upaya yang ditempuh adalah dengan mengkonservasi jenis ini, diluar habitat aslinya. Penelitian dilakukan di dua tempat yaitu habitat asli merbau (*in situ*) dan di luar habitat aslinya (*ex situ*). Habitat asli merbau yaitu kawasan Hutan Taman Wisata Alam Gunung Meja (HTWAGM) di kabupaten Manokwari dan kawasan Hutan Bembab di kabupaten Manokwari Selatan. Habitat diluar habitat asli yaitu di persemaian Manokwari (Balai Latihan Kehutanan) mewakili musim pancaroba dan persemaian Fakultas Kehutanan UGM di Yogyakarta mewakili musim hujan dan kemarau. Penelitian berlangsung selama 6 bulan pengamatan. Penelitian bertujuan menilai performa merbau (kualitas tapak, produktifitas, biodiversitas dan kesehatan) dihabitat asli/*in situ*, mengetahui pertumbuhan dan perkembangan bibit merbau secara generatif (*in situ-ex situ*) sebagai rujukan menyusun instrumen penilaian bibit merbau yang sehat berkualitas dan adaptif, serta menentukan prosfektifitas instrumen terhadap penilaian bibit merbau sehat berkualitas dan adaptif dalam rangka mendukung konservasi produktif secara *in situ- ex situ*. Analisis kualitas tapak, produktifitas, indeks biodiversitas dan kualitas kesehatan dilakukan untuk menilai performa merbau pada sebaran aslinya. Analisis media tanam, Analisis anova satu dan dua arah terhadap pengaruh naungan dan interaksi musim dan naungan terhadap komponen pertumbuhan pada persemaian *in situ-ex situ*, gangguan terhadap bibit (hama dan penyakit), penentuan bibit merbau sehat berkualitas dan sehat adaptif dengan *MultiDimensional Scalling* serta analisis prosfektifitasnya. Hasil penelitian menunjukkan merbau dapat tumbuh dengan baik pada tapak dengan kualitas komponen dari rendah-sangat tinggi. Produktifitas tegakan merbau tertinggi pada plot pengamatan di kawasan HTWAGM dengan nilai LBDS 0,35 m^2, volume 4,91 m^3 pada kelas diameter 0,62-0,68 cm. Total 72 spesies dijumpai hidup berdampingan dengan merbau di semua tingkatan pertumbuhan. *Pometia coreacea* adalah salah satu dari jenis yang selalu dijumpai pada tiga lokasi penelitian dengan nilai *Chi-square* tertinggi (X^2 =2,00). Nilai indeks biodiversitas jenis pendamping (kekayaan, kesamaan, keanekaragaman dan kemerataan) mengindikasikan suatu komunitas pendukung yang stabil dengan tingkat kekayaan dan kemerataan yang tinggi. Di persemaian *in situ*, tinggi bibit tertinggi 43,08 cm pada naungan rapat, diameter dan jumlah daun pada naungan sedang yaitu 0,57 cm 28 helai. Benih merbau terinfeksi patogen penyebab busuk benih (*Fusarium* spp.) dan hama (belalang dan kutu putih) dijumpai menyerang daun dan pucuk bibit dengan kriteria ringan-sehat. Nilai ordinansi bibit merbau sehat berkualitas di persemaian *in situ*, mencapai kategori berkualitas (63,32%) pada naungan rapat. Sedangkan berdasarkan nilai *leverage*, yang perlu diprioritaskan adalah intensitas serangan hama intensitas serangan penyakit, indeks kekokohan, dan frekuensi serangan penyakit Nilai ordinansi bibit merbau sehat adaptif ditunjukkan dengan nilai ordinasi kategori moderat di semua kondisi naungan dengan kisaran 48,40% - 52,84%. Sedangkan berdasarkan nilai *leverage* prioritas yaitu intensitas serangan

hama dan frekuensi serangan penyakit. Pada persemaian *ex situ*, di musim hujan dan kemarau benih merbau dapat bertumbuh dengan baik. Komponen pertumbuhan terbaik pada musim hujan berturut-turut tinggi 46,44 cm pada naungan rapat, diameter dan jumlah daun yaitu 0,57 cm dan 23 helai pada naungan sedang. Sedangkan di musim kemarau tinggi 38,54, diameter 0,62 cm dan jumlah daun 36 helai yang kesemuanya dihasilkan pada naungan sedang. Komposisi nutrisi media tanam pada kedua musim berada pada kategori sangat rendah-sangat tinggi. Patogen busuk benih *Fusarium* sp., *Aspergillus* spp., dan hama belalang, kutu putih dijumpai menyerang daun dan pucuk, dengan kriteria ringan-sehat. Nilai ordinansi bibit merbau sehat berkualitas di persemaian *ex situ* pada musim hujan dan kemarau berturut-turut adalah kategori berkualitas 70,93% (naungan jarang) dan 62,87% (naungan sedang). Sedangkan nilai *leverage* prioritas adalah unsur hara makro bibit, intensitas serangan hama, unsur hara mikro serta jumlah daun. Nilai ordinansi bibit merbau sehat adaptif pada kedua musim berturut-turut adalah kategori berkualitas 64,36% (naungan jarang) dan moderat 47,73% - 59,49% (semua naungan). Sedangkan nilai leverage prioritas adalah intensitas serangan hama dan penyakit, unsur hara makro dan mikro media tanam. Bibit merbau sehat berkualitas dihasilkan dengan kategori berkualitas dimusim hujan dengan 5 faktor yang berpengaruh, sedangkan bibit merbau sehat adaptif kategori moderat di semua musim dengan 4 faktor yang saling berpengaruh. Konservasi *circa situm* berpeluang diterapkan guna memaksimalkan peran masyarakat adat dalam pengelolaan hasil antara dari jenis merbau sebelum hasil kayu.

Kata kunci: *Intsia bijuga*, persemaian *in situ – ex situ*, bibit sehat berkualitas, bibit sehat adaptif, konservasi *in situ*, konservasi *circa situm*, konservasi *ex situ*

ABSTRACT

Merbau (*Intsia bijuga* Colebr O. Kuntze) is an endemic species that is becoming rare and requires concrete efforts to minimize overexploitation. One of the efforts being made is to conserve this species outside its original habitat. Research was conducted in two places, namely the natural habitat of merbau (*in situ*) and outside its original habitat (*ex situ*). The natural habitat of merbau is forest area of the Gunung Meja Nature Tourism Park in Manokwari district and the Bembab forest area in South Manokwari district. The habitat outside its original habitat is the Manokwari nursery (Forestry Training Center) representing the transitional season and the Faculty of Forestry UGM nursery in Yogyakarta representing the rainy and dry seasons. The research was carried out for 6 month. The study aims to assess the performance of merbau (soil quality, productivity, biodiversity, and health) in its natural habitat/in situ, to determine the growth and development of merbau seedlings generatively (*in situ-ex situ*) as a reference for developing assessment tools for healthy, high-quality, and adaptive merbau seedlings, and to determine the prospect of the tool for assessing healthy, high-quality, and adaptive merbau seedlings in support of productive conservation in situ-ex situ. Analysis of soil quality, productivity, biodiversity index, and health quality was carried out to assess the performance of merbau in its natural distribution. Analysis of growing media, one and two way ANOVA analysis on the effect of shade and the interaction of season and shade on the growth components of seedlings in the in situ-ex situ nursery, disturbance to seedlings (pests and diseases), determination of healthy, high-quality, and adaptive merbau seedlings with MultiDimensional Scalling, and analysis of the prospect of the tool. The results showed that merbau can grow well in areas with soil quality components ranging from low to very high. The highest productivity of merbau stands was observed in the TWAGM area with an LBDS value of 0.35 m2, volume of 4.91 m3 at a diameter class of 0.62-0.68 cm. A total of 72 species were found living alongside merbau at all growth levels. *Pometia coreacea* is one of the species always found in all three research locations with the highest Chi-square value ($X^2 = 2.00$). The biodiversity index value of companion species (richness, similarity, diversity, and evenness) indicates a stable supporting community with high richness and evenness levels. The growth components of seedlings in the in situ nursery had heighest of 43.04 cm in dense shade, diameter and number of leaves in medium shade was 0.57 cm and 28 pieces. Merbau seeds were infected with seed rot pathogenic fungi (*Fusarium* spp.), and pests (grasshoppers and whiteflies) were found to attack the leaves and shoots of seedlings with mild-healthy criteria. The ordination value of healthy, high-quality merbau seedlings in the in situ nursery reached the high-quality category (63.32%) in dense shade. Based on the value of leverage, the priority should be given to the intensity of pest attacks, intensity of disease attacks, resilience index, and frequency of disease attacks. The adaptive healthy merbau seedlings are indicated by a moderate category of ordination values in all shade conditions, ranging from 48.40% - 52.84%. Meanwhile, based on the value of leverage, the priority is given

to the intensity of pest attacks and frequency of disease attacks. In ex-situ nurseries, merbau seeds can grow well in both rainy and dry seasons. The best growth components in the rainy season were a height of 46.44 cm in dense shade, a diameter and number of leaves of 0.57 cm and 23 leaves in moderate shade. Meanwhile, in the dry season the height is 38.54, the diameter is 0.62 cm and the number of leaves is 36, all of which are produced in moderate shade.The nutrient composition of the growing media in both seasons is categorized as very low to very high. Seed rot pathogens, such as *Fusarium* sp. and *Aspergillus* spp., and pests such as grasshoppers and whiteflies, are found attacking the leaves and shoots, with mild to healthy criteria. The value of healthy merbau seedlings in high-quality nurseries in the rainy and dry seasons, respectively, are categorized as 70.93% (sparse shade) and 62.87% (moderate shade). Meanwhile, the priority value is given to macro-nutrient elements of the seedlings, intensity of pest attacks, micro-nutrient elements, and number of leaves. The value of adaptive healthy merbau seedlings in both seasons, respectively, are categorized as high quality 64.36% (sparse shade) and moderate 47.73% - 59.49% (all shades). Meanwhile, the priority value is given to the intensity of pest and disease attacks, macro and micro-nutrient elements of the growing media. High-quality healthy merbau seedlings are produced in the rainy season with five influential factors, while moderately adaptive healthy merbau seedlings are produced in all seasons with four interrelated factors. Conservation of the circa situm has the potential to be applied to maximize the role of indigenous communities in managing the intercrop yields of merbau species, before timber products.

Keywords: *Intsia bijuga*, *in situ* - *ex situ* nursery, high quality healthy seedlings, adaptive healthy seedlings, *in situ* conservation, circa situm conservation, *ex situ* conservation.