KARAKTERISASI MORFOLOGI, MOLEKULER, DAN KULTUR *IN VITRO Vanda tricolor* Lindley var. suavis FORMA MERAPI DAN FORMA LAWU

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INTISARI

Indonesia sebagai pusat keanekaragaman anggrek menghadapi penurunan populasi *Vanda tricolor* Lindl. var. *suavis* akibat degradasi habitat. Penelitian ini mengkaji perbanyakan *in vitro*, karakterisasi morfologi, dan analisis gen *HOMEOBOX1* pada Forma Merapi dan Lawu. Metode meliputi mikropropagasi biji menggunakan media VW dengan variasi hormon (NAA, TDZ), pengukuran parameter morfologi kuantitatif (ukuran tanaman) dan kualitatif (bentuk, warna), serta analisis molekuler melalui isolasi DNA, amplifikasi gen *VOH*1, dan konstruksi filogenetik. Hasil menunjukkan keberhasilan perbanyakan tertinggi pada media VW+TDZ 3 ppm (Merapi) dan VW+TDZ 1 ppm+NAA 2 ppm (Lawu) dengan perkecambahan >80%. Teridentifikasi variasi morfologi signifikan: forma Merapi memiliki habitus lebih tinggi (78 cm), bunga lebih besar, dan aroma lebih kuat, sedangkan forma Lawu menghasilkan buah lebih panjang dan labellum lebih lebar. Gen *VOH*1 (175 bp) teramplifikasi pada kedua forma tanpa perbedaan struktural, mengindikasikan konservasi genetik. Simpulan penelitian menyatakan keragaman fenotipik dipengaruhi faktor lingkungan, sementara gen *homeobox1* bersifat stabil. Protokol mikropropagasi teroptimasi ini efektif mendukung konservasi *ex situ* spesies.

Kata kunci: Anggrek, Gen *HOMEOBOX1*, *In vitro*, Vacin and Went, *Vanda tricolor*

MORPHOLOGICAL, MOLECULAR CHARACTERIZATION, AND *IN VITRO* CULTURE OF *Vanda tricolor* Lindley var. suavis FORMA MERAPI AND FORMA LAWU

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ABSTRACT

As a global orchid biodiversity hotspot, Indonesia faces declining populations of *Vanda tricolor* Lindl. var. *suavis* due to habitat degradation. This study examined *in vitro* propagation, morphological characterization, and *HOMEOBOX1* gene analysis of Forma Merapi and Lawu. Methods included seed micropropagation on VW medium with hormonal variations (NAA, TDZ), quantitative and qualitative (shape, color) morphological measurements, and molecular analysis via DNA isolation, *VOH1* gene amplification, and phylogenetic analysis Results demonstrated optimal propagation on VW+TDZ 3 ppm (Merapi) and VW+TDZ 1 ppm+NAA 2 ppm (Lawu), achieving >80% germination success. Significant morphological variations were identified: Forma Merapi exhibited taller habitus (78 cm), larger flowers, and stronger scent, while Forma Lawu produced longer fruits and wider labellum. The *VOH1* gene (175 bp) was amplified in both formae without structural divergence, indicating genetic conservation. The study concludes that phenotypic diversity is environmentally modulated, whereas the *HOMEOBOX* gene remains conserved. This optimized micropropagation protocol provides an effective strategy for *ex situ* conservation.

Key word: *HOMEOBOX1* gene, *In vitro,* Orchid, Vacin and Went, *Vanda tricolor*

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