

## ABSTRAK

### UPAYA KONSERVASI *EX SITU* ANGGREK *Dendrobium lineale* Blue MELALUI KULTUR BIJI, PEMBESARAN *SEEDLING IN VITRO* DAN AKLIMATISASI PLANLET

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Anggrek merupakan salah satu komoditas florikultura penting di Indonesia yang memiliki peran dalam industri hortikultura sebagai tanaman hias bunga potong. Menurut data IUCN (*International Union for Conservation of Nature and Natural Resources*) 2018, spesies anggrek *Dendrobium lineale* masuk ke dalam *redlist* yang berarti spesies ini harus mendapat perhatian khusus agar terjaga dari hampir terancam punah. Salah satu upaya untuk menjaga agar anggrek spesies tidak terancam punah yaitu melalui konservasi *ex situ* melalui kultur *in vitro* biji hasil *selfing*. Penelitian yang terdiri dari tiga percobaan ini dilaksanakan di Laboratorium Ilmu Tanaman dan Rumah kaca, Fakultas Pertanian, Universitas Lampung dari bulan Agustus 2021 sampai dengan Juli 2022. Ketiga percobaan menggunakan rancangan acak lengkap (RAL) dengan tiga ulangan. Percobaan I adalah studi pengecambahan biji anggrek *Dendrobium lineale* Blue, bertujuan untuk mempelajari pengaruh jenis media dasar (Growmore (32:10:10) dan Growmore (20:20:20), dan pemberian benziladenin/BA (0, 0,1 dan 0,5 mg/l) terhadap perkecambahan biji dan pertumbuhan protokorm anggrek. Percobaan II adalah studi pembesaran seedling *in vitro*, bertujuan untuk mempelajari pengaruh jenis media dasar Growmore (32:10:10) dan Gaviota (21:21:21) dan pemberian KNO<sub>3</sub> (0, 1, dan 2 g/l) terhadap pertumbuhan *in vitro seedling* anggrek *Dendrobium lineale* Blue. Percobaan III bertujuan untuk mempelajari pengaruh media aklimatisasi (sabut kelapa atau pakis cacah) dan jenis pupuk daun (Gandasil D 20:15:15 dan Growmore 32:10:10) terhadap keberhasilan aklimatisasi dan pertumbuhan planlet *ex vitro*.

Hasil percobaan pengecambahan biji anggrek *Dendrobium lineale* Blue menunjukkan bahwa media dasar Growmore (32:10:10) menghasilkan bobot

100 protokorm *Dendrobium lineale* Blue *in vitro* yang lebih tinggi dibandingkan dengan media dasar Growmore (20:20:20). Penambahan BA pada konsentrasi 0,1 dan 0,5 mg/l menekan pertumbuhan protokorm anggrek untuk membentuk primordia daun. Media dasar dan konsentrasi BA tidak berinteraksi dalam mempengaruhi pengecambahan dan pertumbuhan protokorm anggrek *Dendrobium lineale* Blue *in vitro*.

Hasil percobaan pembesaran *seedling* *Dendrobium lineale* Blue *in vitro* menunjukkan bahwa media dasar Growmore (32:10:10) menghasilkan pertumbuhan *seedling* lebih baik daripada Gaviota (21:21:21), yang ditunjukkan oleh variabel tinggi *seedling*, jumlah daun, lebar daun, dan bobot segar *seedling*. Penambahan KNO<sub>3</sub> 2 g/l meningkatkan pertumbuhan *seedling* anggrek *Dendrobium lineale* Blue *in vitro* pada variabel jumlah daun. Media dasar dan konsentrasi KNO<sub>3</sub> tidak berinteraksi dalam mempengaruhi pertumbuhan *seedling* anggrek *Dendrobium lineale* Blue *in vitro*.

Hasil percobaan aklimatisasi planlet *Dendrobium lineale* Blue menunjukkan bahwa pada umur 6 minggu setelah dikeluarkan dari botol, planlet *Dendrobium lineale* Blue menghasilkan keberhasilan aklimatisasi 100%. Media aklimatisasi sabut kelapa menghasilkan pertumbuhan planlet *Dendrobium lineale* Blue yang lebih baik dibandingkan media pakis cacah. Hal ini ditunjukkan oleh variabel panjang akar. Penggunaan pupuk daun Gandasil D (20:15:15) dan Growmore (32:10:10) tidak berpengaruh terhadap pertumbuhan planlet yang di aklimatisasi pada semua variabel pengamatan. Media aklimatisasi dan jenis pupuk tidak berinteraksi dalam mempengaruhi pertumbuhan planlet *Dendrobium lineale* Blue.

**Kata kunci:** Aklimatisasi planlet, BA, *Dendrobium lineale* Blue, KNO<sub>3</sub> teknis, media dasar, pengecambahan biji *in vitro*, pakis, pupuk, sabut kelapa, *seedling*.

## ABSTRACT

### EFFORT ON *EX SITU* CONSERVATION OF *Dendrobium lineale* Blue (ORCHIDACEAE) THROUGH *IN VITRO* SEED CULTURE, SEEDLING GROWTH AND ACCLIMATIZATION

By

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Orchid is one of the important floricultural commodities in Indonesia which has significant impact on horticultural industry, either as cut flower or as pot plants. *Dendrobium lineale* is included in the redlist, according IUCN (International Union for Conservation of Nature and Natural Resources) 2018, which means this species should be carefully cultivated and prevented to become a nearly threatened species. Efforts to conserve this species *ex situ* should be done, and this could be conducted through *in vitro* seed culture from pod of self-pollinated flowers. This experiment was carried out at Plant Science Laboratory and Greenhouse of Faculty of Agriculture, the University of Lampung, from August 2021 to July 2022. All of the three experiments used a completely randomized design with three replications. This study consisted of three experiments, i.e., (1) *in vitro* seed germination and protocorm growth of *Dendrobium lineale* Blue; (2) effects of basal media and KNO<sub>3</sub> on *in vitro* seedling growth, and (3) Effects of acclimatization media and two foliar fertilizers on the success of acclimatization and *ex vitro* seedling growth.

Results of experiment 1 showed that the basal medium Growmore (32:10:10) produced better seed germination and protocorm growth than Growmore (20:20:20), which was indicated by higher weight of 100 protocorm of *Dendrobium lineale* Blue. The addition of 0.1 and 0.5 mg/l benzyladenine (BA) in the medium suppressed growth of the protocorm to form leaf primordia, so that almost all of the protocorms remain globular. There was no significant interaction between basal medium and BA concentrations to influence *in vitro* seed germination and growth of *Dendrobium lineale* Blue protocorm.

Results of experiment 2 showed that growth of *Dendrobium lineale* Blue seedlings was better on the Growmore (32:10:10) medium compared to Gaviota (21:21:21) medium, which was indicated by higher seedling height, leaf number, leaf width, and seedling fresh weight. Addition of KNO<sub>3</sub> at 2 g/l increased growth of *Dendrobium lineale* Blue seedlings *in vitro* as showed by more number of leaves compared to control. There was no significant interaction between basal media and KNO<sub>3</sub> concentrations on the *in vitro* growth of *Dendrobium lineale* Blue seedlings.

Results of experiment 3 showed that after 8 weeks on *ex vitro* condition, all (100%) of *Dendrobium lineale* Blue plantlets were successfully acclimatized and showed normal growth as indicated by the formation of new shoots and roots. The acclimatization medium from coconut fiber resulted in better growth of *Dendrobium lineale* Blue plantlets than those on chopped ferns media, which was shown by longer root length. The use of Gandasil D (20:15:15) and Growmore (32:10:10) foliar fertilizers had no significant effect on the growth of acclimatized plantlets on all of the observed variables. The two acclimatization media and type of fertilizers did not interact each other to influence growth of *Dendrobium lineale* Blue plantlets.

**Keywords:** Acclimatization, basal media, chopped ferns, coconut fibers, *Dendrobium lineale* Blue, KNO<sub>3</sub>, seed germination, NPK fertilizers, *seedling*.