

## KARAKTERISASI GEN *RKD4* HOMOLOG PADA KULTUR *IN VITRO* ANGGREK *Dendrobium lineale* Rolfe

Oleh:

Anastasia Wahyu Widayati

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### INTISARI

*Dendrobium lineale* merupakan anggrek endemik papua yang populasinya terancam punah karena eksploitasi berlebih tanpa adanya konservasi dan perubahan lingkungan yang ekstrem pada habitat aslinya. Upaya konservasi dilakukan dengan perbanyakan massal bibit anggrek melalui teknik kultur *in vitro* yang meliputi perkecambahan biji dan embriogenesis somatik. Proses embriogenesis diregulasi secara poligenik yang diawali dengan aktifnya suatu gen kunci yaitu *RKD4*. Penelitian ini dilakukan untuk mengetahui pengaruh pepton terhadap pertumbuhan dan ekspresi gen *RKD4* homolog pada embrio zigotik serta pengaruh NAA dan TDZ secara tunggal maupun kombinasi terhadap ekspresi gen *RKD4*. Pada penelitian ini, medium *New Phalaenopsis* (NP) dengan variasi penambahan pepton digunakan untuk perkecambahan biji. Sedangkan medium NP dengan variasi NAA dan TDZ digunakan untuk induksi embriogenesis somatik. Pada setiap tahap perkecambahan dan pertumbuhan embrio somatik dilakukan analisis morfologis dan analisis ekspresi gen *RKD4* homolog. Hasil penelitian menunjukkan bahwa penambahan pepton 2 g/L dapat meningkatkan frekuensi perkecambahan biji sebanyak 9,42%. Pepton tidak mempengaruhi ekspresi gen *RKD4* yang terakspresi pada minggu ke-2 baik pada kontrol maupun perlakuan. NAA dan TDZ mampu menginduksi terbentuknya embrio somatik dan dapat mengaktifasi gen *RKD4* pada eksplan protokorm.

Kata kunci : *Dendrobium lineale*, perkecambahan *in vitro*, embriogenesis somatik, *RKD4*.

## THE CHARACTERIZATION OF RKD4 HOMOLOGOUS GENE IN *Dendrobium lineale* Rolfe ORCHID CULTURE

By:

Anastasia Wahyu Widayati

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### ABSTRACT

*Dendrobium lineale* is an endemic orchid of papua whose population is threatened with extinction due to over-exploitation without conservation and extreme environmental changes in its natural habitat. Conservation efforts are carried out by mass multiplication of orchid seeds through *in vitro* culture techniques which include seed germination and somatic embryogenesis. The embryogenesis process is regulated polygenically which begins with the activation of a key gene, *RKD4*. This study was conducted to determine the effect of peptone on growth and expression of homologous *RKD4* genes in zygotic embryos and the effect of NAA and TDZ singly or in combination on *RKD4* gene expression. In this study, New Phalaenopsis (NP) medium with variations in the addition of pepton was used for seed germination. While the NP medium with variations of NAA and TDZ was used for the induction of somatic embryogenesis. At each stage of somatic embryo germination and growth, morphological analysis and homologous *RKD4* gene expression analysis were carried out. The results showed that the addition of 2 g / L of pepton could increase the frequency of seed germination by 9.42%. Pepton did not affect the expression of the expression of *RKD4* gene at week 2 in both control and treatment. NAA and TDZ is able to induce the formation of somatic embryos and can activate the *RKD4* gene in protocorm explants.

Keyword: *Dendrobium lineale*, *in vitro* germination, somatic embryogenesis, *RKD4*