

## **“Ekspresi Gen Vitellogenin Reseptor dan Perilaku Makan *Pentalonia nigronervosa* yang Membawa BBTV (*Banana Bunchy Top Virus*)”**

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19/448865/PPN/04480

### **INTISARI**

*Banana Bunchy Top Virus* (BBTV) adalah agen penyebab *Banana Bunchy Top Disease* (BBTD) yang ditularkan oleh kutudaun pisang, *Pentalonia nigronervosa*. Dalam penelitian ini, untuk mengetahui pengaruh keberadaan virus BBTV di tubuh *Pentalonia nigronervosa* terhadap ekspresi gen *VgR* dan bagaimana perkembangan populasi serta perilaku makan serangga vektor. Berdasarkan hasil *Sequence Read Archive* (SRA) pada data transkriptomik RNA-Seq di Genbank, akses kode SRX6918251 dan SRX6918252, gen vitellogenin reseptor (*VgR*) ditemukan di *Pentalonia nigronervosa*, gen *VgR* merupakan gen esensial yang terkait dalam mengatur reproduksi dari *Pentalonia nigronervosa*. *VgR* dipelajari melalui deteksi, sekuensing nukleotida dan ekspresi gen dengan melakukan perlakuan akuisisi virus BBTV. Ekspresi gen *VgR* pada BBTV viruliferous dan non-viruliferous dipelajari melalui analisis qPCR. Ekspresi gen *VgR* memberikan hasil yang fluktuatif, gen *terupregulated* hingga 5 jam, kemudian *downregulated* hingga 10 jam pasca akuisi, namun ekspresi itu diregulasi kembali dari 10 hingga 20 jam. Analisis hubungan filogeni *VgR* terdeteksi dan sangat mirip dengan ordo Hemiptera. Uji perkembangan populasi menunjukkan perbedaan yang tidak signifikan antara total populasi *Pentalonia nigronervosa* di BBTV viruliferous dan non-viruliferous, tetapi memberikan hasil yang signifikan pada *new born aphid* dan *imago apterous*. Sedangkan hasil perilaku makan kutudaun pisang tidak menunjukkan hasil yang signifikan terhadap jumlah aktivitas jaringan floem namun memberikan hasil signifikan pada kativitas pra-floem. Penelitian ini diharapkan dapat memberikan informasi tentang keberadaan virus di tubuh *Pentalonia nigronervosa* dengan adanya gen *VgR* yang mempengaruhi perkembangan populasi dan perilaku makan sehingga dapat dikembangkan metode alternatif baru untuk pengelolaan kutudaun pisang, sehingga Penyakit BBTV pada pisang dapat dikelola dengan baik

Kata kunci: *Banana bunchy top virus* (BBTV), *Pentalonia nigronervosa*, vitellogenin reseptor, ekspresi gen, populasi, perilaku makan.

## ABSTRACT

Banana Bunchy Top Virus (BBTV) is an agent that causes Banana Bunchy Top Disease (BBTD) which is transmitted by the banana aphid, *Pentalonia nigronervosa*. In this study, to know the effect virus BBTV in the whole body of *Pentalonia nigronervosa* by to understand how the expression of VgR and how the population development of their feeding behavior. The results of Sequence Read Archive (SRA) on RNA-Seq transcriptomic data in Genbank, code access SRX6918251 and SRX6918252, vitellogenin receptor gene (VgR) was found in *Pentalonia nigronervosa*. VgR is related to gen essential regulation of reproduction of the *Pentalonia nigronervosa*. VgR was studied through the detection, nucleotide sequencing, and the expression of the genes with and without the BBTV acquisition. The expression of the VgR gene before and after BBTV acquisition was studied through qPCR analysis. The expression gene of VgR gives fluktuactive there was upregulated to 5 h, leading to down-regulated up to 10 h post acquisition, however, the expression was upregulated from 10 to 20 h. The phylogeny gene sequencing of VgR was detected and highly homogenous to those of Hemiptera ordo. The result of population growth showed not a significant difference between the total population of *Pentalonia nigronervosa* in BBTV viruliferous and non-viruliferous, but significant results on the newborn aphid and imago apterous. Meanwhile, the results of the feeding behavior of banana aphids did not show significant results on the amount of phloem tissue activity but were significant in pra-phloem activity. This study is expected to provide information about of virus in the whole body of *Pentalonia nigronervosa* with the existence of the VgR gene that affects population development and feeding behavior so that alternative new methods can be developed for the management of the vector banana aphid, so that BBTV disease in bananas can be managed well control.

Keywords: Banana bunchy top virus (BBTV), *Pentalonia nigronervosa*, vitellogenin receptor, gene expression, population, feeding behavior