VULNERABILITY AND RESISTANCE GENE EXPRESSION ON VANNAMEI SHRIMP (*Litopenaeus vannamei*) AS A RESPONSE TO *WHITE SPOT SYNDROME VIRUS* (WSSV) INFECTED

ABSTRACT

The problems caused by the availability of seeds is very limited Stock Pathogen Free (SPF) shrimp farming causes entrepreneurs make repeat spawning without strict supervision. For that we need to know about the nature of resistant SPF vannamei shrimp that exist today and the expression of genes that play a role in it. Based on the results obtained from a series of studies conducted in mind that SPF shrimp vannamei Indonesia still not 100% resistant to White Spot Syndrome Virus (WSSV) disease. The fact that vannamei shrimp infected by WSSV give different effects, indicating that resistance vannamei shrimp against WSSV attack is varied. Information on gene expression and susceptibility and resistance genes that express dominant WSSV disease, it is very important to know. Results of detection WSSV infection using standard primers showed that the shrimp that was resistant mild infection. This means that the insertion of WSSV virus occurs, but in relatively small amounts so that the shrimp can survive and not to experience death until the end of treatment. In the susceptible shrimp were detected positive was attacked by WSSV. Amplification showed that insertion virus in unit 10^3 copies / reaction. *ICP11* expressed genes in shrimp vannamei are susceptible, whereas in the resistant vannamei shrimp expression does not occur. On-resistant shrimp was occur *ICP11* gene amplification but not, this shows that the shrimp that are resistant to produce metabolites like Pro po that capable of inhibiting the expression of *ICP11*, so that damage and cell death does not occur. WSSV disease has no effect on the presence of chitinase in vannamei shrimp body, whereas in the gene encoding the haemocyanin amplified on vannamei shrimp are susceptible and resistant to attack and not amplified WSSV in infected shrimp vannamei that no WSSV. Ribbon produced from the amplification of genes encoding trypsin on a susceptible group sampled shrimp and shrimp that are resistant to attack WSSV produced the same band. The thickness or quantity of the gene encoding the trypsin from shrimp vannamei that had been infected by WSSV either vulnerable or resilient is relatively similar, while the shrimp are not infected less. This fact showed that there was genetic differences between vannamei shrimp, which have an impact on differences in their immune against WSSV. This answered the assumption that spawning repeatedly made by farmers to obtain the parent with a cheap price reduction impacts of genetic seed quality.

Keywords: *ICP11, survival rate, chitinase, haemocyanin, trypsin, resistance, vulnerability*

KEBARUAN PENELITIAN

Kebaruan dari penelitian ini dapat dilihat dari beberapa aspek :

1. **Aspek pemanfaatan gen *ICP11*.** Kemanfaatan dari gen *ICP11* belum banyak diteliti. Pada penelitian ini, dimanfaatkan sifat dominannya dalam mengekspresikan penyakit WSSV dalam bidang perikanan yaitu sebagai marker molekuler identifikasi infeksi virus WSSV, yang mampu membedakan ekspresi gen *ICP11* pada udang yang rentan, tahan dan tidak diinfeksi WSSV.
2. **Aspek gen pengkode hemosianin sebagai ekpresi gen ketahanan pada udang vannamei.** Penelitian mengenai hemosianin yang telah dilakukan berkaitan dengan fungsinya dalam melawan penyakit (Lei *et al*., 2008). Pada penelitian ini ditemukan perbedaan ekspresi gen pengkode hemosianin pada udang vannamei yang terinfeksi dan tidak diinfeksi penyakit WSSV.
3. **Aspek gen pengkode tripsin sebagai ekpresi gen kerentanan pada udang vannamei.** Selama ini penelitian tentang tripsin berkaitan dengan peningkatan infeksi virus dalam organisme (Clark *et al.,* 1981). Pada penelitian ini ditemukan perbedaan ekspresi gen pengkode tripsin pada udang terinfeksi dan tidak diinfeksi WSSV**.**
4. **Aspek pemanfaatan secara bersama antara gen *ICP11,* gen pengkode hemocyanin dan gen pengkode tripsin.** Ketiga gen ini dapat dimanfaatkan sebagai dasar kegiatan pemuliaan dalam hal seleksi induk yang tahan terhadap penyakit WSSV.