

**Pemberian Ekstrak Alginat dari *Padina* sp. secara Oral untuk  
Meningkatkan Parameter Imun Non-spesifik dan  
Ekspresi Gen Imun pada Udang Vaname (*Litopenaeus vannamei*)**

Ayuningtyas  
13/351806/PMU/07724

**INTISARI**

Imun non-spesifik memiliki peranan penting pada sistem imun udang. Penelitian ini bertujuan untuk mengevaluasi pemberian ekstrak alginat dari *Padina* sp terhadap respon imun non-spesifik dan ekspresi gen imun udang vaname. Udang putih *L. vannamei* ( $20 \pm 2$  g) diberi pakan yang mengandung ekstrak alginat 0, 2 dan 4 g/kg selama 15 hari. Pengambilan darah dilakukan pada hari ke-0, 5, 10 dan 15. *Total hemocyte count* (THC), aktivitas fagositosis (AF) dan indeks fagositosis (IF), diamati dengan mikroskop. Aktivitas *phenoloksidase* (PO), aktivitas *superoxide dismutase* (SOD), dan total protein plasma (TPP) diamati dengan metode kolorimetri. Ekspresi gen LGBP, lectin, toll, dan proPO diamati dengan metode qRT-PCR. Indeks fagositosis (IF) dan TPP menunjukkan perbedaan yang signifikan pada hari ke-10. THC, AF, aktivitas SOD dan aktivitas PO mengalami peningkatan signifikan pada hari ke-15, begitu juga dengan ekspresi gen LGBP, toll, lectin dan proPO. Gen toll mengalami peningkatan ekspresi paling tinggi yaitu 13,9 kali dibanding kontrol. Berdasarkan hal tersebut, dapat disimpulkan bahwa ekstrak alginat dari *Padina* sp. mampu meningkatkan respon imun dan ekspresi gen imun pada udang putih *L. vannamei*, sehingga berpotensi untuk dikembangkan sebagai imunostimulan.

Kata kunci: alginat, imun udang, imun non-spesifik, *pattern recogniton receptor*

## Oral Administration of Alginate Extract from *Padina* sp. to Enhance Non-specific Immune Parameter and Expression of Immune Gene of White Shrimp (*Litopenaeus vannamei*)

Ayuningtyas  
13/351806/PMU/07724

### ABSTRACT

Non-specific immune plays an important role in shrimp immune system. This research aimed to evaluate the effects of alginate extract from *Padina* sp. on immune respons and expression of immune genes in *L. vannamei*. White shrimp *L. vannamei* (20±2 g) was fed diets containing alginate extract at 0, 2 and 4 g/kg for 15 days. Haemolymph was taken on 0<sup>th</sup>, 5<sup>th</sup>, 10<sup>th</sup>, and 15<sup>th</sup> days. Total hemocyte count (THC), phagocytosis activity (PA) and phagocytosis indeks (PI) were measured by microscope. Phenoloxidase activity (PO), superoxide dismutase activity (SOD) and total protein plasma (TPP) were measured by colorimetry method. LGBP, lectin, toll, and proPO were measured by qRT-PCR method. Phagocytosis indeks (PI) and TPP significantly increased at 10<sup>th</sup> day. Total hemocyte count (THC), PA, PO, and SOD activity significantly increased at 15<sup>th</sup> day. The expressions of LGBP, toll, lectin, and proPO elevated. Toll gene had the highest increase by 13,9 comparing to the control treatment. It was concluded that alginate extract from *Padina* sp. elevates immune respons and expression of immune genes in *L. vannamei*, so it might be applied as an immunostimulant.

*Keywords: alginate, crustacean immune, non-specific immune, pattern recognition receptor*