

INTISARI

KEMAMPUAN ADAPTASI ABALONE (*Haliotis squamata*) TERHADAP STRESSOR SUHU, KLOORIN, INFEKSI *Vibrio alginolyticus* DAN BAHAN ORGANIK

Ngurah Sedana Yasa

Abalone *Haliotis squamata* dikenal dengan nama kerang mata tujuh yang mulai dikembangkan di Indonesia, selain memiliki kelebihan dalam cita rasa, juga memiliki kelemahan karena mudah mengalami stress. Penelitian ini bertujuan mengetahui kemampuan adaptasi abalone terhadap beberapa stressor yaitu suhu, klorin, *Vibrio alginolyticus* dan bahan organik. Parameter yang dievaluasi adalah *falling rate*, sintasan, ekspresi gen-gen HSP70 dan HSP90, aktifitas enzim antioksidan (SOD, CAT dan PO), serta perubahan struktur histologi otot kaki paska pemberian stressor. Benih abalone yang digunakan berukuran 3-4 cm hasil pembenihan di Unit Kekerangan, Balai Produksi Induk Udang Unggul dan Kekerangan Karangasem Bali. Pipa PVC 4" sepanjang 30cm dan diisi benih abalone sebanyak 30 ekor kedua ujung pipa ditutup dengan waring hitam #0,5cm dan diikat dengan karet gelang. Pipa PVC diletakkan secara vertikal ke dalam aquarium kaca dengan volume 100L. Empat paket penelitian ini dilakukan dengan 3 perlakuan dan 1 kontrol yang diulang sebanyak 3 kali. Rancangan percobaan menggunakan Rancangan Acak Lengkap (RAL). Data dianalisis dengan analisis varian pada selang, dan kepercayaan 95% yang dilanjutkan dengan uji Tukey's jika analisis variance berbeda nyata. Analisa data menggunakan perangkat lunak IBM SPSS V.23.0 USA. Hasil penelitian menunjukkan bahwa kemampuan adaptasi abalone berbeda-beda tergantung pada jenis dosis dan waktu paparan stressor yang diberikan. Pemberian stressor suhu, klorin, *V. alginolyticus* dan bahan organik mampu mempengaruhi parameter imunologi seperti THC, SOD, CAT, PO. Perubahan aktifitas enzim tersebut umumnya dimulai pada jam ke 12. Pemberian berbagai stressor juga mempengaruhi ekspresi gen HSP70 dan HSP90 yang upregulasinya secara umum dimulai pada jam ke 12. Stressor suhu, klorin dan *V. alginolyticus* mampu mempengaruhi struktur histologi otot kaki abalone seperti suhu lebih dari 30°C, klorin lebih dari 10 ppm, dan paparan infeksi *V. alginolyticus* dengan kepadatan lebih dari 10⁵ cfu. Namun pada pemberian stressor bahan organik tidak dijumpai adanya perubahan struktur histologi pada otot kaki abalone.

Kata kunci: *H. squamata*, THC, SOD, CAT, PO, ekspresi gen, Hsp70, Hsp90, *falling rate*, sintasan

ABSTRACT

ABALONE (*Haliotis squamata*) ADAPTATION CAPABILITY ON STRESSORS OF THERMAL, CHLORINE, *Vibrio alginolyticus* INFECTION AND ORGANIC MATTER

Ngurah Sedana Yasa

Abalone *Haliotis squamata* is an indigenous species in Indonesia caught at the southern coast of Bali with high commercial value and excellent meat taste. The technology for abalone seed production has been developed in Indonesia since 2008. However, the market for *H. squamata* has suffered some economic losses because of its sensitivity to stress. This study was aimed to determine the capability of abalone on adaptation to several stressors such as thermal, chlorine, *Vibrio alginolyticus* and organic matter. The study was observed of THC, falling rates, survival rate, HSP70/HSP90 genes expression, and biochemical activities such as SOD, CAT and PO, and histological structure changes in the foot muscles after exposure to a stressor. The abalone seeds used were 3-4cm of shell length obtained from Abalone hatchery unit, under National Broodstock Centre for Shrimp and Mollusk located at Karangasem Bali. The study was conducted using a 30 cm length of 4 "PVC pipe which were filled with 30 abalone seeds. PVC pipe which have already stocked with the seeds, then both ends of the pipe were covered with polyethylene net with mesh size of #0.5cm and tied with rubber bands. The PVC pipes were placed vertically into a rectangular aquarium glass with a volume of 100L. The four packages of this study were carried out with 3 treatments and 1 control. The experimental design used a completely randomized design (CRD). Data were analyzed by analysis of variance using IBM SPSS V.23.0 USA software. The results showed that abalone adaptation capabilities were varies depending on the type, dose and exposure time of the stressor given. Various types of stressors influence immunological parameters such as THC, SOD, CAT and PO. Changes in enzyme activity generally begun at the 12th hour post treatment. The stressors also affected the expression of HSP70 and HSP90 genes which were upregulated at 12th hour post treatment. Changes in histological structure of the abalone's foot muscles were found when the abalone were exposed at temperatures over 30°C, chlorine over 10 ppm, and infected with *V. alginolyticus* at density of more than 10⁵ cfu. However, there was no change in histological foot structure when organic matter was used as a stressor.

Keywords: *H. squamata*, THC, SOD, CAT, PO, gene expression, Hsp70, Hsp90, falling rate, survival rate