ABSTRAK

Potensi Ekstrak Buah Berenuk *(Crescentia cujete* L.*)* terhadap Performa, Profil Hematologi, Imunoekspresi *Cyclooxygenase*-2 dan Limfosit *Cluster Differentiation*-4 pada Ikan Mas Ranchu *(Carassius auratus)*

Diajukan oleh
Felician Lestari Wongkar
23/525182/PKH/00842

Budidaya ikan mas Ranchu (*Carassius auratus*) merupakan salah satu budidaya yang diminati para pecinta ikan hias. Budidaya ikan mas Ranchu rentan mengalami wabah penyakit yang disebabkan oleh bakteri dan virus. Pencegahan dapat dilakukan dengan pemberian imunostimulan yang dilapisi pada pakan. Penggunaan imunostimulan ekstrak buah berenuk *(Crescentia cujete* L.*)* yang mengandung senyawa *α-tocopherol* dapat meningkatkan status imunitas hewan dan memiliki potensi dalam budidaya perikanan. Penelitian ini bertujuan untuk menganalisis potensi imunostimulan ekstrak buah berenuk terhadap performa, profil hematologi, imunoekspresi COX-2 dan limfosit CD-4^+ pada ikan mas Ranchu. Penelitian ini menggunakan 30 ekor ikan mas Ranchu (3 bulan, 15.82±1.20 g) yang dibagi dalam 6 perlakuan, sebagai berikut: P1 = pakan tanpa ekstrak, P2 = pakan dilapisi CMC Na, P3 = Pakan dilapisi imunostimulan POWER C®, P4 = Pakan dilapisi ekstrak buah berenuk 0,15%, P5 = Pakan dilapisi ekstrak buah berenuk 0,3%, P6 = Pakan dilapisi ekstrak buah berenuk 0,6%. Perlakuan dilakukan selama 28 hari dengan frekuensi pemberian pakan 2 kali sehari sebanyak 2% dari berat badan ikan. Selama 28 hari diambil data performa dan pada hari ke-28 pengambilan sampel darah untuk dilanjutkan pemeriksaan profil hematologi, imunoekspresi COX-2 dan Limfosit CD-4^+. Data dianalisis secara statistik menggunakan software SPSS versi 26. Hasil penelitian performa ikan P6 menunjukkan angka pertumbuhan paling besar dibandingkan P1, P2, P3, P4, dan P5 ($p < 0,05$). Hasil hematologi ada perubahan pada yang signifikan pada RBC, persentase hemolisis, konsentrasi ATP dan heterofil P6 dibandingkan P1, P2, P3, P4, dan P5 ($p < 0,05$). Nilai PCV tidak ada peningkatan yang signifikan tetapi ada sedikit penigkatan pada nilai PCV untuk P6 dibandingkan P1, P2, P3, P4, dan P5 ($p > 0,05$). Hb, MCV, MCH, MCHC, WBC, limfosit, monosit, dan platelet tidak ada pengaruh pemberian pakan yang dilapisi ekstrak buah berenuk maupun pakan yang tidak dilapisi ($p > 0,05$). Imunoekspresi menunjukkan adanya penurunan pada COX-2, CRP dan meningkatnya $CD4^+$ seiring bertambahnya konsentrasi ekstrak buah berenuk pada pakan ($p < 0,05$). Kesimpulan penelitian ini yaitu ekstrak buah berenuk 0,6% dapat meningkatkan performa, profil hematologi khususnya RBC, konsentrasi ATP, limfosit $CD4^+$ dan menurunan persentase hemolisis, heterofil, CRP dan imunoekspresi COX-2.

Kata kunci: ikan mas Ranchu, ekstrak buah berenuk, performa, profil hematologi, imunoekspresi COX-2 dan limfosit $CD4^+$

ABSTRACT

Potential of Berenuk Fruit Extract (*Crescentia cujete* L.) on Performance, Hematology Profile, Immunoexpression of Cyclooxygenase-2 and Lymphocyte Cluster Differentiation-4 in Ranchu Goldfish (*Carassius auratus*)

Submitted by
Felician Lestari Wongkar
23/525182/PKH/00842

Ranchu carp (*Carassius auratus*) cultivation is one of the cultivations of interest to ornamental fish lovers. Ranchu carp farming is prone to disease outbreaks caused by bacteria and viruses. Prevention can be done by coating immunostimulants on feed. Using immunostimulants berenuk fruit extract (*Crescentia cujete* L.) containing α-tocopherol compounds can improve the immune status of animals and has potential in aquaculture. This study aims to analyze the immunostimulant potential of berenuk fruit extract on performance, hematological profile, COX-2 immunoexpression and $CD4^+$ lymphocytes in Ranchu carp. This study used 30 Ranchu goldfish (3 months, 15.82±1.20 g), which were divided into six treatments, as follows: P1 = Feed without extract, P2 = Feed coated with CMC Na, P3 = Feed coated with POWER C® immunostimulant, P4 = Feed coated with 0.15% berenuk fruit extract, P5 = Feed coated with 0.3% berenuk fruit extract, P6 = Feed coated with 0.6% berenuk fruit extract. The treatment was carried out for 28 days with a feeding frequency of 2 times daily, as much as 2% of the fish's body weight. During the 28 days, performance data were taken, and on the 28th day, blood samples were taken to continue the examination of the hematological profile and immunoexpression of COX-2 and CD-4+ lymphocytes. Data were statistically analyzed using SPSS software version 26. The results of fish performance research P6 showed the most significant growth rate compared to P1, P2, P3, P4, and P5 ($p < 0.05$). Hematology results showed there were significant changes in RBC, percentage of hemolysis, ATP concentration, and heterophils of P6 compared to P1, P2, P3, P4, and P5 ($p < 0.05$). For PCV values, there was no significant increase, but there was a slight increase in PCV values for P6 compared to P1, P2, P3, P4, and P5 ($p > 0.05$). Hb, MCV, MCH, MCHC, WBC, lymphocytes, monocytes, and platelets were not affected by feeding with berenuk fruit extract coated or uncoated Feed ($p > 0.05$). Immunoexpression showed a decrease in COX-2, CRP, and an increase in CD4+ as the concentration of berenuk fruit extract in Feed increased ($p < 0.05$). The conclusion of this study is that 0.6% berenuk fruit extract can improve performance and hematological profile, especially RBC, ATP concentration, and CD4+ lymphocytes, and reduce the percentage of hemolysis, heterophils, CRP, and COX-2 immunoexpression.

Keywords: Ranchu carp, berenuk fruit extract, performance, hematology profile, immunoexpression of COX-2 and CD4+ lymphocytes.