

## RINGKASAN

Penyakit dapat menurunkan kadar albumin dan protein total yang akan mengganggu fungsi fisiologis dan pertahanan tubuh ikan lele dumbo (*Clarias gariepinus*). Pencegahan penurunan kadar albumin dan protein total akibat penyakit dapat dilakukan dengan pemberian suplemen kaya nutrisi, khususnya protein, seperti menggunakan mikroalga *Spirulina platensis* dan *Chlorella vulgaris*, namun, belum ada penelitian tentang pengaruh kombinasi kedua mikroalga tersebut pada ikan lele dumbo. Penelitian ini bertujuan untuk mengetahui perbedaan kadar albumin dan protein total serum darah ikan lele dumbo (*C. gariepinus*) dapat dipengaruhi oleh suplementasi *Spirulina platensis* dan *Chlorella vulgaris* yang berbeda, serta mendapatkan dosis *S. platensis* dan *C. vulgaris* yang dapat meningkatkan kadar albumin dan protein total serum darah ikan lele dumbo (*C. gariepinus*).

Penelitian dilakukan di Stasiun Percobaan, Laboratorium Fisiologi Hewan, dan Laboratorium Genetika dan Biologi Molekuler Fakultas Biologi Universitas Jenderal Soedirman. Penelitian ini menggunakan metode eksperimental dengan rancangan percobaan Rancangan Acak Lengkap (RAL) yang terdiri dari 5 perlakuan (P0: tanpa suplementasi atau kontrol, P1: suplementasi *S. platensis* 6 g.kg<sup>-1</sup> pakan, P2: suplementasi *C. vulgaris* 4 g.kg<sup>-1</sup> pakan, P3: suplementasi *S. platensis* 3 g.kg<sup>-1</sup> dan *C. vulgaris* 2 g.kg<sup>-1</sup> pakan, dan P4: suplementasi *S. platensis* 2 g.kg<sup>-1</sup> dan *C. vulgaris* 3 g.kg<sup>-1</sup> pakan) dan 4 ulangan dengan masa percobaan selama 56 hari. Variabel pada penelitian ini adalah kadar albumin dan kadar protein total serum. Kadar albumin serum diukur dengan metode *Bromocresol green* dan kadar protein total serum diukur dengan metode Biuret menggunakan kit Glory Diagnostics. Parameter pendukung yang digunakan yaitu analisis proksimat pakan dan faktor lingkungan yang meliputi temperatur dan pH air. Data dianalisis menggunakan *oneway analysis of variance* (ANOVA) dan analisis lanjut *Duncan*. Analisis data dilakukan menggunakan program SPSS 26.0 versi *Windows software*.

Hasil penelitian menunjukkan kadar albumin dan protein total serum darah ikan lele dumbo dipengaruhi secara signifikan ( $P < 0,05$ ) oleh pemberian suplementasi *S. platensis* dan *C. vulgaris*. Kadar albumin serum darah ikan lele dumbo dapat ditingkatkan setelah pemberian suplementasi *C. vulgaris* maupun kombinasi antara *S. platensis* dan *C. vulgaris*, yaitu pada kisaran (2,508-2,624 g.dL<sup>-1</sup>), namun suplementasi *S. platensis* tidak dapat meningkatkan kadar albuminnya (2,326 g.dL<sup>-1</sup>) dan sebanding dengan tanpa pemberian suplementasi (2,169 g.dL<sup>-1</sup>). Sementara kadar protein total serum ikan lele dumbo dapat ditingkatkan dengan pemberian suplementasi *S. platensis*, *C. vulgaris* serta kombinasi keduanya (4,693-4,917 g.dL<sup>-1</sup>) dibandingkan dengan tanpa tanpa suplementasi (3,62 g.dL<sup>-1</sup>). Kesimpulan dari penelitian ini yaitu perbedaan kadar albumin dan protein total serum darah ikan lele dumbo (*Clarias gariepinus*) dapat dipengaruhi oleh pakan suplementasi *Spirulina platensis* dan *Chlorella vulgaris* yang berbeda, serta kadar albumin dan protein total serum darah dapat ditingkatkan dengan pemberian pakan suplementasi *S. platensis* 6 g.kg<sup>-1</sup>, *C. vulgaris* 4 g.kg<sup>-1</sup>, kombinasi *S. platensis* 3 g.kg<sup>-1</sup> dan *C. vulgaris* 2 g.kg<sup>-1</sup>, dan kombinasi *C. vulgaris* 3 g.kg<sup>-1</sup> dan *S. platensis* 2 g.kg<sup>-1</sup>, kecuali suplementasi *S. platensis* 6 g.kg<sup>-1</sup> belum dapat meningkatkan kadar albumin ikan lele dumbo (*C. gariepinus*).

Kata kunci: *albumin*, *Chlorella vulgaris*, *Clarias gariepinus*, *Spirulina platensis*, *protein total*.

## SUMMARY

The disease can reduce albumin and total protein levels which will interfere with the physiological and defense functions of the African catfish (*Clarias gariepinus*). Prevention of decreased albumin and total protein levels due to disease can be done by providing nutritional supplements, especially protein, such as using microalgae such as *Spirulina platensis* and *Chlorella vulgaris*, however, there has been no research on the effect of the combination of both on African catfish. This study aims to knowing differences in albumin and total protein levels in blood serum of African catfish (*C. gariepinus*) can be affected by different supplementation of *Spirulina platensis* and *Chlorella vulgaris*, and to obtain doses of *S. platensis* and *C. vulgaris* which increase albumin and total protein levels of African catfish.

The research was conducted at the Experimental Station, Laboratory of Animal Physiology, and the Laboratory of Genetics and Molecular Biology, Faculty of Biology, Jenderal Sudirman University. This study used an experimental method with a Completely Randomized Design (CRD) consisting of 5 treatments (P0: no supplementation or control, P1: supplementation of *S. platensis* 6 g.kg<sup>-1</sup> of diet, P2: supplementation of *C. vulgaris* 4 g.kg<sup>-1</sup> of diet, P3: supplementation of *S. platensis* 3 g.kg<sup>-1</sup> and *C. vulgaris* 2 g.kg<sup>-1</sup> of diet, and P4: supplementation of *S. platensis* 2 g.kg<sup>-1</sup> and *C. vulgaris* 3 g.kg<sup>-1</sup> of diet) and 4 replicates with treatment period of 56 days. The variables in this study were serum albumin levels and serum total protein levels. Albumin levels were measured by the Bromocresol green method and total serum protein levels were measured by the Biuret method using the Glory Diagnostics kit. Supporting parameters used are proximate analysis of feed and environmental factors include water temperature and pH. The data will be analyzed using one-way analysis of variance (ANOVA) and Duncan's further analysis if there are differences. Data analysis was performed using SPSS 26.0 software Windows version.

The results showed that serum albumin and protein levels of African catfish were significantly affected ( $P < 0.05$ ) by supplementation with *S. platensis* and *C. vulgaris*. Blood serum albumin levels of African catfish can be increased after supplementation with *C. vulgaris* or a combination of *S. platensis* and *C. vulgaris*, which is in the range (2,508-2,624 g.dL<sup>-1</sup>), but supplementation with *S. platensis* cannot increase albumin levels. (2,326 g.dL<sup>-1</sup>) and comparable with no supplementation (2.169 g.dL<sup>-1</sup>). Meanwhile, the serum total protein level of African catfish can be increased by supplementation with *S. platensis*, *C. vulgaris*, and a combination of the both (4.693-4.917 g.dL<sup>-1</sup>) compared to without supplementation (3.62 g.dL<sup>-1</sup>). The conclusion of this study is that differences in albumin and total protein levels in blood serum of African catfish (*Clarias gariepinus*) can be affected by different supplements of *Spirulina platensis* and *Chlorella vulgaris*, and albumin and total blood serum protein levels can be increased by supplementation with *S. platensis* 6 g.kg<sup>-1</sup>, *C. vulgaris* 4 g.kg<sup>-1</sup>, the combination of *S. platensis* 3 g.kg<sup>-1</sup> and *C. vulgaris* 2 g.kg<sup>-1</sup>, and the combination of *C. vulgaris* 3 g.kg<sup>-1</sup> and *S. platensis* 2 g.kg<sup>-1</sup>, except supplementation of *S. platensis* 6 g.kg<sup>-1</sup> has not been able to increase albumin levels in African catfish (*C. gariepinus*).

Keywords: *albumin*, *Chlorella vulgaris*, *Clarias gariepinus*, *Spirulina platensis*, *total protein*