

PENGARUH PENAMBAHAN PROBIOTIK *Bacillus* spp., *Lactococcus raffinolactis*, *Saccharomyces cerevisiae* DAN IMUNOSTIMULAN GAMA ALGIN F PADA PAKAN TERHADAP AKTIVITAS ENZIM DAN KONDISI HISTOLOGIS USUS LELE (*Clarias* sp.)

Kegiatan budidaya ikan tidak terlepas dari ancaman penyakit yang disebabkan oleh mikroorganisme patogen. Selain itu, budidaya dengan kepadatan tinggi, mendorong peningkatan penggunaan pakan. Untuk itu, tingkat pencernaan pakan melalui sangat penting diperhatikan melalui aktivitas enzim dan histologis usus guna mengoptimalkan daya absorpsi pakan sehingga penyerapan pakan lebih maksimal. Probiotik berperan dalam memperbaiki kualitas air, sistem kekebalan tubuh, kelangsungan hidup, pertumbuhan ikan dan, pencernaan pakan. Imunostimulan Gama Algin F terbukti mampu meningkatkan ketahanan ikan terhadap stres, sehingga ikan dapat memanfaatkan energi untuk pertumbuhan secara efisien. Tujuan penelitian ini yaitu mengetahui pengaruh pemberian probiotik *Bacillus* spp., *Lactococcus raffinolactis*, *Saccharomyces cerevisiae* dan imunostimulan Gama Algin F dalam pakan terhadap histologis usus dan aktivitas enzim pencernaan lele (*Clarias* sp.). Penelitian menggunakan Rancangan Acak Lengkap dengan empat perlakuan dan tiga ulangan yaitu P0 (kontrol), P1 (probiotik), P2 (imunostimulan) dan P3 (probiotik dan immunostimulan). Aplikasi probiotik dan imunostimulan dilakukan setiap hari. Dosis probiotik yang diberikan yaitu 100 ml/kg pakan ($7,3 \cdot 10^9$ CFU/kg), imunostimulan Gama Algin F 100 ml/kg pakan dan *S. cerevisiae* 0,5 g/kg. Parameter yang diamati adalah aktivitas meliputi enzim protease, lipase, selulase, sel goblet, ketebalan otot dinding usus dan panjang vili. Hasil penelitian menunjukkan aplikasi probiotik dan imunostimulan mampu meningkatkan aktivitas protease dan lipase pada hari ke-30 serta meningkatkan aktivitas selulase pada hari ke-60. Aplikasi probiotik dan imunostimulan berpengaruh terhadap ketebalan lapisan otot dinding usus dan jumlah sel goblet pada hari ke-60.

Kata kunci : lele, probiotik, imunostimulan, histologi usus, aktivitas enzim

ABSTRACT

THE EFFECT OF DIETARY PROBIOTICS *Bacillus* spp., *Lactococcus raffinolactis*, *Saccharomyces cerevisiae* AND IMUNOSTIMULANT GAMA ALGIN F ON THE CATFISH (*Clarias* sp.) INTESTINAL ENZYME ACTIVITY AND HISTOLOGICAL CONDITION

Fish farming activities are inseparable from the threat of diseases caused by pathogenic microorganisms. In addition, high-density aquaculture encourages increased feed utilization. For this reason, it is very important to pay attention to the level of feed digestibility through enzyme activity and intestinal histology in order to optimize feed absorption power so that maximum feed absorption. Probiotics play a role in improving water quality, immune system, survival, fish growth and feed digestibility. Immunostimulant Gama Algin F is proven to increase fish resistance to stress, so that fish can utilize energy for growth efficiently. The purpose of this study was to determine the effect of giving probiotics *Bacillus* spp., *Lactococcus raffinolactis*, *Saccharomyces cerevisiae* and Gama Algin F immunostimulant in feed on intestinal histology and digestive enzyme activity in catfish (*Clarias* sp.). The study used a completely randomized design with four treatments and three replicates namely P0 (control), P1 (probiotics), P2 (immunostimulant) and P3 (probiotics and immunostimulant). Application of probiotics and immunostimulants was done daily. The dose of probiotics given was 100 ml/kg ($7,3.10^9$ CFU/kg), immunostimulant Gama Algin F 100 ml/kg feed and *S. cerevisiae* 0.5 g/kg. Parameters observed were activities including protease enzymes, lipase enzymes, cellulose enzymes, goblet cells, intestinal wall muscle thickness and villus length. The results showed that the application of probiotic and immunostimulant was able to increase protease and lipase activity on day 30 and increase cellulase activity on day 60. Application of probiotics and immunostimulant had an effect on the thickness of the muscle layer of the intestinal wall and the number of goblet cells intestinal wall and goblet cell count at day 60.

Keywords: catfish, probiotics, immunostimulants, intestinal histology, enzyme activity