ABSTRAK

RESPON PERUBAHAN JARINGAN USUS, HATI, DAN GINJAL IKAN GABUS (*Channa striata*) DENGAN PEMBERIAN PROBIOTIK *Bacillus* sp. DALAM PAKAN BERBASIS PROTEIN NABATI

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Pakan merupakan faktor penting bagi pertumbuhan, perkembangan, dan kelangsungan hidup ikan. Peningkatan pesat akuakultur mendorong tingginya permintaan tepung ikan sebagai sumber protein hewani, sehingga diperlukan alternatif pengganti. *Distillers Dried Grain with Solubles* (DDGS) menjadi salah satu sumber protein nabati potensial, namun memiliki kandungan serat tinggi dan asam amino rendah. Untuk mengoptimalkan penyerapan nutrisi, ditambahkan taurin dan probiotik *Bacillus* sp. yang berperan meningkatkan kesehatan organ vital ikan. Penelitian ini bertujuan mengevaluasi pengaruh probiotik *Bacillus* sp. pada pakan berbasis DDGS terhadap struktur jaringan usus, hati, dan ginjal ikan gabus (*Channa striata*). Penelitian menggunakan metode Rancangan Acak Lengkap dengan empat perlakuan dan tiga ulangan, yaitu penambahan probiotik *Bacillus* sp. dengan dosis berbeda pada pakan berformula DDGS 20% + taurin 1,5%: 0 ml/kg (P1), 15 ml/kg (P2), 30 ml/kg (P3), dan 45 ml/kg (P4). Ikan uji berbobot awal 49,2 ± 0,47 g dipelihara selama 60 hari. Parameter yang diamati meliputi laju pertumbuhan harian, indeks viscerasomatik, indeks hepatosomatik, serta histopatologi usus, hati, dan ginjal. Hasil menunjukkan perbedaan nyata pada indeks viscerasomatik, laju pertumbuhan harian, dan histopatologi usus. Nilai tertinggi indeks viscerasomatik terdapat pada P4 (6,10%), laju pertumbuhan harian terbaik pada P3 (4,65%), dan histopatologi usus terbaik pada P3 dengan kerusakan edema terendah (0,67%). Indeks hepatosomatik, histopatologi hati, dan ginjal tidak berbeda nyata antar perlakuan. Pemberian probiotik *Bacillus* sp. 30 ml/kg pakan terbukti mampu mengurangi perubahan struktur jaringan usus, tetapi belum mampu mengurangi perubahan struktur jaringan hati dan ginjal ikan yang diberi pakan berbasis protein nabati.

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Kata Kunci: *Distillers Dried Grain with Solubles*, Histopatologi, Probiotik.

ABSTRACT

RESPONSE OF CHANGES IN INTESTINAL, LIVER, AND KIDNEY TISSUE OF SNAKEHEAD FISH (*Channa striata*) WITH PROBIOTIC PROVISION *Bacillus* sp. IN PLANT-BASED PROTEIN FEED

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Feed is an important factor for the growth, development, and survival of fish. The rapid increase in aquaculture has driven high demand for fish meal as a source of animal protein, so alternatives are needed. *Distillers Dried Grain with Solubles* (DDGS) is one potential source of vegetable protein, but it has a high fiber content and low amino acids. To optimize nutrient absorption, taurine and probiotic *Bacillus* sp. are added which play a role in improving the health of vital fish organs. This study aims to evaluate the effect of probiotic Bacillus sp. in DDGS-based feed on the structure of intestinal tissue, liver, and kidney of snakehead fish (*Channa striata*). The study used a Completely Randomized Design method with four treatments and three replications, namely the addition of probiotic *Bacillus* sp. with different doses in feed formulated with 20% DDGS + 1.5% taurine: 0 ml/kg (P1), 15 ml/kg (P2), 30 ml/kg (P3), and 45 ml/kg (P4). Test fish with an initial weight of 49.2 ± 0.47 g were reared for 60 days. Observed parameters included daily growth rate, viscerasomatic index, hepatosomatic index, and histopathology of the intestine, liver, and kidney. The results showed significant differences in the viscerasomatic index, daily growth rate, and intestinal histopathology. The highest viscerasomatic index value was found in P4 (6.10%), the best daily growth rate was in P3 (4.65%), and the best intestinal histopathology was in P3 with the lowest edema damage (0.67%). The hepato-somatic index, liver histopathology, and kidney histopathology did not differ significantly between treatments. Administration of the probiotic *Bacillus* sp. 30 ml/kg of feed was shown to reduce changes in intestinal tissue structure, but was unable to reduce changes in liver and kidney tissue structure in fish fed a plant-based protein feed.
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Keywords: *Distillers Dried Grain with Solubles,* Histopathology, Probiotics.