

**Title :** Effect of Straw Mushroom (*Volvariella volvacea*) on Oxidative Stress and Histology of Whiteleg Shrimp (*Litopenaeus vannamei*)

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## ABSTRACT

Oxidative stress is a major challenge in shrimp aquaculture, leading to impaired physiological function and tissue damage. Natural bioactive compounds from edible mushrooms have attracted attention as potential dietary antioxidants. The objective of this study was to investigate the effects of straw mushroom (*Volvariella volvacea*) supplementation on oxidative stress status and histological characteristics of whiteleg shrimp (*Litopenaeus vannamei*). Shrimp were fed diets containing 10% straw mushroom for 2 weeks. Oxidative markers, including malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), glutathione reductase (GR), and glutathione (GSH), were evaluated in hepatopancreas, gill, intestine, muscle, and hemolymph. Histological examinations were conducted in hepatopancreas, gill, intestine, and muscle tissues. The results revealed tissue-specific responses to dietary supplementation. MDA levels were significantly reduced in gill and intestine tissues ( $p < 0.05$ ) compared to the control group, indicating decreased lipid peroxidation. In addition, GSH content was significantly elevated in the intestine ( $p < 0.05$ ) compared to the control group. No significant alterations were detected in SOD, CAT, GPx, or GR activities across all examined tissues. Oxidative parameters in hepatopancreas, muscle, and hemolymph also showed no significant changes. Histological analysis demonstrated well-preserved tissue architecture without evidence of cellular damage in all examined organs. These findings suggest that straw mushroom supplementation provides selective antioxidant protection by reducing lipid peroxidation in specific tissues, particularly the gill and intestine, while maintaining overall tissue integrity in whiteleg shrimp.

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