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Editorial

Litopenaeus Vannamei Feeding Activity and Development on Soybean Based Diets with Added Feeding Effectors

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EDITORIAL NOTE

Fish is an important human food source that provides essential nutrients while also contributing to global food security. Approximately 90% of global aquaculture production is concentrated in the Asia-Pacific region, with China, India, and Indonesia as the top producers. With the production of high-value fish destined for export, fish farming in developing countries provides domestic food security and supports rural livelihoods. More than 3 billion people rely on marine and coastal biodiversity for their livelihoods, according to the United Nations. Acidic ocean environments impede fish growth by limiting their ability to calcify bones, as well as increasing the metabolic cost of life and thus the amount of gases that must be carried across the gills. Regrettably, we know very little about the effects of warm acidic conditions on important fish species. Regrettably, we know very little about the effects of warm acidic conditions on important fish species. As a result, research into the combined effects of ocean warming and acidification on marine fish growth is needed, as well as estimates of the ecological and economic costs to wild fish populations (fisheries) and marine fish farming.

Ocean warming and acidification have far-reaching consequences that must be considered in the context of sustainable wild fish capture and aquaculture production in marine environments. In order to evaluate the effect on gill health caused by larger and more frequent phytoplankton and zooplankton blooms in coastal areas, more research is required. Algal blooms are toxic to both fish and humans as a result of the variable influx of freshwater to marine estuaries caused by volatile rain patterns, ocean warming, and increased carbon dioxide in the oceans. As a result, the developmental impacts of rising temperatures and ocean acidification (climate change) must be comprehended. Because of their vital role in gas and ion exchange, the goal of this Research Topic is to put together a series of articles focused on the early development of marine fish, with a particular emphasis on gill health and function in response to climate change.

Result of the variable influx of freshwater to marine estuaries caused by volatile rain patterns, ocean warming, and increased carbon dioxide in the oceans. As a result, the developmental impacts of rising temperatures and ocean acidification (climate change) must be comprehended. Because of their vital role in gas and ion exchange, the goal of this Research Topic is to put together a series of articles focused on the early development of marine fish, with a particular emphasis on gill health and function in response to climate change. In larval kingfish, a large pelagic fish with a worldwide distribution, we investigated the effects of elevated CO_2 and temperature at levels projected for the end of the century on activity levels, boldness, and metabolic characteristics (i.e., oxygen uptake rates). We also looked at the relationships between these behavioural and physiological traits as a function of therapy. Kingfish were reared in a complete factorial design of ambient and elevated CO_2 and temperature from the egg stage to 25 days post-hatch. When compared to fish reared at room temperature, the activity levels of fish from the elevated temperature treatment were highest.

However, increased CO_2 had no effect on activity, and neither did increased CO_2 or temperature have any effect on boldness. When compared to fish reared in ambient conditions, elevated CO_2 and temperature increased resting oxygen uptake rates, but had no effect on maximum oxygen uptake rates or aerobic scope. Under normal conditions, resting oxygen uptake rates and boldness were negatively correlated, but when the temperature was raised, they were positively correlated. These results indicate that increased temperature has a greater effect on larval kingfish behavioral and physiological characteristics than increased CO_2. Increased CO_2 exposure, on the other hand, increased resting oxygen uptake rates and interacted with temperature in complex ways.

New behavioral and physiological information on the larval stage of a large pelagic fish's responses to ocean acidification and warming, show correlations between these characteristics, and indicate that these correlations may influence the direction.

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