

THE EFFECTS OF DECOMPOSING MANGROVE LEAF LITTER TANNINS ON THE WATER QUALITY, GROWTH AND SURVIVAL OF TIGER PRAWN (*PENAEUS MONODON*) POST-LARVAE

Rejeki Sri¹, Middeljans Marcel², Widowati Riri¹, Restiana Wisnu¹, Bosma Roel H.².

1: Aquaculture Department, Faculty Fisheries & Marine Sciences, Diponegoro University

2: Aquaculture & Fisheries group, Wageningen University, Netherlands

Abstract

Integrated mangrove-shrimp sylvo-aquaculture is an ecosystem-based system practiced in Purworejo, Demak, Indonesia. Mangrove leaves may impact shrimp health and yield. Therefore we compared the effect of decomposing fresh leaves of *Avicennia marina* and *Rhizophora apiculata*, on water quality and performance of tiger prawn (*Penaeus monodon*) post-larvae (PL). Hundred PL21 (0.28g) were stocked in 33 aerated tanks, with 800L of brackish water, assigned to triplicates of six concentrations (g/L) of both species' leaves: 0 (control), 0.125, 0.25, 0.5, 0.125 minced leaves and 0.125 leachate of minced leaves. The PL were fed 3x daily with pellets at 10% of initial total body weight. Temperature, salinity, dissolved oxygen (DO) and pH were recorded daily. Tannin, H₂S and NH₃-N concentrations were measured every ten days. After 37 days, growth and survival were measured. Treatments and leaf' concentrations had no effect on DO, tannin, NH₃-N and H₂S, but pH was slightly reduced to 8.4 (P<0.05). NH₃-N increased from 0.67 mg/L to levels critical and lethal to the PL (> 0.74 to 0.99 mg/L). Mean tannin concentrations were low (*marina*: 1.9 ± 1.4; *apiculata*: 2.1 ± 1.5 mg/L) and did not correlate with other water quality parameters, nor survival rate (62 ± 14 to 70 ± 8) and shrimp growth (1.5 to 2.1 g). The higher weight in 0.5 g/L *apiculata* was probably related to a higher mortality rate and thus feed availability. The NH₃-N levels with decomposing mangrove leaves of *Avicennia marina* and *Rhizophora apiculata* were toxic for shrimp in tanks without water exchange.

Keywords: *Penaeus monodon*, *Avicennia marina*, *Rhizophora apiculata*, ammonia-N, tannin.