

# Experimental infections of crustaceans with luminous bacteria related to *Photobacterium* and *Vibrio*. Effect of salinity and pH on infectiosity

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## Abstract

Luminous bacterial shrimp diseases have recently become a major problem in shrimp hatcheries in Indonesia and other Asian countries. Luminous bacteria were isolated from moribund shrimp larvae from hatcheries in Jepara in December 1990. These isolates consisted of two groups which were closely related to *Vibrio harveyi* and *Photobacterium phosphoreum*. Pathogenicity tests demonstrated that several strains were pathogenic to *Artemia nauplii* and *Penaeus monodon* larvae at concentrations of 10<sup>4</sup> and 10<sup>3</sup> cfu/ml respectively. The virulence of the bacteria was related to the age of the larvae, such that 25.28% of zoea, 47.08% of mysis and 51.50% of postlarvae survived 48 h exposure to the pathogen. The bacteria were unable to cause significant mortalities to barnacle and *Macrobrachium* larvae but were pathogenic to *P. indicus* larvae indicating that they exhibit a degree of host specificity and that barnacles may be a potential reservoir for these disease-causing bacteria. Most outbreaks of luminous bacterial disease in Indonesia occur during the rainy season. Exposure of luminous bacterial pathogens to low salinities (10,15 ppt) for 12 h before use in immersion challenge experiments with *Penaeus monodon* larvae resulted in significantly enhanced mortalities ( $P < 0.05$ ). This may account in part for the seasonality of luminous bacterial disease outbreaks. Exposure of luminous bacteria to acid pH (5.5) significantly reduced their pathogenicity toward penaeid prawn larvae ( $P < 0.05$ ). These results imply that environmental factors may play a key role in disease outbreaks.

Keywords: *Vibrio* spp; *Photobacterium* spp; Bacteria; Diseases and their control crustaceans; Indonesia

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