INDONESIAN HATCHERY REARED SEABASS LARVAE (*Lates calcarifer*), ASSOCIATED WITH VIRAL NERVOUS NECROSIS (VNN)

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ABSTRACT

Mass mortality amongs seabass larvae, *Lates calcarifer*, reared in hatcheries in East Java and Bali due to viral nervous necrosis were investigated. Outbreaks of the disease occurred from August to November 1997. Each time the disease occurred, cumulative mortality of the larvae reached 100%. Infected fish were characterized by abnormal behaviour such as swimming upside down or sinking to the bottom. Bacteria or parasites associated with the disease were not detected in infected fish. Histopathologically, necrosis and vacuolation in the brain and retina were observed. Abundant spherical viral particles, 30 nm in diameter, were found in the cytoplasm of affected nerve cells. These findings revealed that the mortalities among seabass larvae were due to viral nervous necrosis (VNN) caused by nodavirus.

KEYWORDS: seabass, *Lates calcarifer*, viral nervous necrosis, nodavirus.

INTRODUCTION

Seed production techniques for various marine fish and shellfish have been developed in Indonesia. Seabass, *Lates calcarifer* is one of the species marked as new and potential commodity for aquaculture. However, mass mortality in the larval stages due to unidentified diseases have led to frequent decreases in production in recent years.

In 1997, mass mortalities of seabass larvae, *Lates calcarifer* occurred at hatcheries in Situbondo, East Java, and in Gerokgak, Bali in August and then in Banyuwangi in November. The mortality rate reached 100% in all cases. Clinical signs of the infected fish were characterized by abnormal behavior such as swimming upside down or sinking to the bottom.

Mass mortalities in seabass larvae due to a viral infection called viral nervous necrosis (VNN) (Glazebrook *et al.*, 1990; Renaulte *et al.*, 1991; Munday *et al.*, 1992) have been reported in Australia and the Mediterranean. VNN has also been reported in a wild variety of cultured marine fish species, and has caused serious damage to the industry in Japan (Yoshikoshi & Inoue, 1990; Mori *et al.*, 1991).

In this study, a histopathological study of the mass mortalities at three seabass hatcheries in Indonesia was conducted to elucidate the cause of the mortalities.

MATERIALS AND METHODS

Fish Examined

One to two-month-old larvae of seabass reared in East Java and Bali showing abnormal behavior such as swimming upside down or sinking to the bottom, were examined for this study. The origin of the eggs distributed to the these hatcheries identical. Water temperatures were 27-29° C when outbreaks of the disease occurred.

Parasitological and Bacteriological Examinations

The gills and body surface were examined for parasites by using light microscope. Bacteria from the liver and brain were isolated using marine agar and TCBS agar, then incubated at 27° C and 35° C respectively for 48 hours.

Histological Examination

About 20 of moribund seabass larvae from each hatchery were used for histological examination and 5 were used for observation transmission electron microscopy. The whole body of moribund larvae was fixed in 10% phosphate buffered formalin. The sample was then embedded in paraffin wax and the section was stained with haematoxylin-eosin (H&E). For transmission electron microscopy, the sample was re-fixed in a 2.5% glutaraldehyde- 2% paraformaldehyde mixture (pH 7.4), then post-fixed with 1% osmium

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