

Parasitic Infestation of Giant Freshwater Prawn *Macrobrachium rosenbergii* from Kedah, Perak and Negeri Sembilan

KUA B.C.^{1/}, NUMERAN M.N.^{2/} and OO M.G.^{1/}

^{1/}National Fish Health Research Centre, Fisheries Research Institute, NaFisH FRI Batu Maung, 11960 Batu Maung, Penang, Malaysia. kuabeng@fri.gov.my

^{2/}Bukit Kayu Hitam Fish Quarantine Centre, Bukit Kayu Hitam, 06050 Jitra, Kedah, Malaysia.

Abstract: Though the impact of parasitic infections on giant freshwater prawn *Macrobrachium rosenbergii* is generally regarded low, there are new diseases being reported recently. As more *M. rosenbergii* fry are entering the country from Thailand, monitoring of their health status needs to be tightened to prevent disease occurrence. Screening of parasitic infestation on *M. rosenbergii* was carried out since 2007: cultured samples taken from 2 states (Kedah and Negeri Sembilan) and wild samples from one state (Perak). The study showed symptom of black spots/patches on the rostrum, carapace, pleopod or telson in most of the prawn samples (average body weight: 52.67g). Prevalence of 100% of this symptom was seen in Kedah and Negeri Sembilan samples while 18.37% were recorded for Perak sample. Parasitic examination revealed protozoa infection (*Zoothamnium* sp. and *Vorticella* sp.) with prevalence of 100% (n=91), 75% (n=34) and 69.39% (n=49) from Kedah, Perak and Negeri Sembilan samples respectively. Nematopsis sp. (A gregarine of protozoan) with a prevalence of 68.75% was found in wild samples from Perak. Infection of leech cocoon was seen in most of Kedah samples with a prevalence of 21.97% and a mean intensity of cocoon per prawn was 45.55. In Perak, a higher prevalence of 35.8% with a mean intensity of 139.30 per prawn was recorded. However, no infection of leech cocoon was seen from cultured prawn from Negeri Sembilan.

Keywords: *Macrobrachium rosenbergii*, parasite, cocoon, wild, cultured prawn

Abstrak: Walaupun umumnya impak jangkitan parasit pada udang galah *Macrobrachium rosenbergii* adalah rendah, namun terdapat penyakit baru yang dilaporkan. Dengan kemasukan larva *M. rosenbergii* dari Negara Thailand, pemantauan kesihatan perlu diperketatkan bagi mencegah kejadian penyakit. Pemantauan jangkitan parasit pada *M. rosenbergii* telah dimulakan sejak 2007; udang galah ternak dari 2 negeri (Kedah dan Negeri Sembilan) dan udang galah liar dari negeri Perak. Kajian menunjukkan simptom bintik/tompok hitam pada bahagian rostrum, karapas, kaki renang atau 'telson' pada kebanyakan sampel (purata berat badan: 52.67 g). Prevalen 100% simptom ini dapat dilihat pada sampel dari Kedah dan Negeri Sembilan sementara itu hanya 18.37% direkodkan dari sampel negeri Perak. Pemeriksaan parasit menunjukkan jangkitan protozoa (*Zoothamnium* sp. and *Vorticella* sp.) dengan prevalen 100% (n=91), 75% (n=34) dan 69.39% (n=49) dalam sampel dari Kedah, Perak dan Negeri Sembilan. Parasit 'gregarine' (*Nematopsis* sp.) dari kumpulan protozoa dengan prevalen 68.75% juga ditemui pada udang galah liar dari sampel Perak. Jangkitan 'cocoon' lintah banyak ditemui dalam sampel dari Kedah dengan prevalen 21.97% dan purata intensiti 'cocoon' per udang galah, 45.55. Prevalen 35.8% adalah lebih tinggi di Perak dengan purata intensiti 139.30 per udang galah. Walau bagaimanapun, tiada jangkitan 'cocoon' lintah ditemui pada sampel udang galah ternak dari Negeri Sembilan.

Introduction

Macrobrachium rosenbergii is getting popular in Malaysia as it is now being farmed on a large scale. In year 2007, the production of freshwater giant prawn was 24, 645 tonnes with a retail value of RM 8,026,760.00 as compared to 19,376 tonnes (RM 6,540,040.00) in 2006 (Annual Statistics Fisheries, 2007 and 2006). Without exception, freshwater giant prawn is susceptible to diseases caused by parasites, bacteria and virus. Parasitic diseases are mainly of protozoan infestation (e.g. *Zoothamnium* sp., *Vorticella* sp. and *Epistylis* sp.) and have less economic impact as compared to bacterial (e.g. Vibriosis) and viral diseases. The reported viruses in prawn are *Macrobrachium* hepatopancreatic parvo-like virus (MHPV), *Macrobrachium* muscle virus (MMV), infectious hypodermal & hematopoietic necrosis virus (IHHNV), white spot syndrome virus (WSSV), *Macrobrachium rosenbergii* nodavirus (MrNV) and extra small virus-like particle (XSV). The latter two viruses, MrNV and XSV, are causative agents of white tail disease (WTD) which can cause immense economic losses in hatcheries and farms, with 100% mortality (Sahul Hameed *et al.*, 2004).

Though the impact of parasitic infections on giant freshwater prawn *Macrobrachium rosenbergii* is generally low, there are new diseases being reported recently. As more *M. rosenbergii* fry are entering the

country from Thailand, monitoring of their health status needs to be tightened to prevent disease occurrence. Screening of parasitic infestation on *M. rosenbergii* has been going on since 2007 and the present study aims to determine the status of parasitic infection in *M. rosenbergii* from Kedah, Perak and Negeri Sembilan.

Materials and Methods

Source of *M. rosenbergii*

Three locations were chosen for the present study with the cultured samples taken from the states of Kedah and Negeri Sembilan and the wild samples from the state of Perak. The Kedah samples actually came from Thailand as they were brought into Malaysia for food consumption and fishing activities via the Quarantine Centre at Bukit Kayu Hitam (PKI, Bkt. Kayu Hitam). They were examined at the Parasite Laboratory of the National Fish Health Research Centre (NaFisH), Penang. As for Negeri Sembilan and Perak samples, parasitic examination was conducted on site. The average body weight from the 174 samples was 52.67 ± 9.10 g.

Examination of parasite

Both ectoparasites and endoparasites were examined. The pleopods, stomach and gut were removed and placed on a petri dish containing 0.85% normal saline and examined under dissecting microscope at magnification 440x. Further examinations were all conducted under compound microscope (Leica DM5000B) with magnification of 100-400x and connected to a digital camera (Leica DFC 320) associated with computer software (Leica QWin). All parasites noted were recorded and preserved in 70% alcohol for identification. Methods used in preparing specimens for taxonomic studies and identification of parasites followed that of Kabata (1985) while prevalence and mean intensity were based on Margolis *et al.* (1982).

Results and Discussion

Symptoms of black spots/patches on the rostrum, carapace, pleopod or telson were observed in most of the prawn samples (Fig. 1) with 100% prevalence in Kedah and Negeri Sembilan samples and 18.37% for Perak (Table 1). Black spots/patches on body surface or other parts of body were normally due to melanisation and highly indicative of a disease problem (Bondad-Reantaso *et al.*, 2001).

Parasitic examination revealed protozoa infection (*Zoothamnium* sp. and *Vorticella* sp.) with a prevalence of 100% (n=91), 75% (n=34) and 69.39% (n=49) in samples from Kedah, Perak and Negeri Sembilan respectively. Fouling caused by ectoparasites such as protozoa infection is often observed in larvae of *M. rosenbergii* but less or no problem in juvenile or adult stages. The high prevalence of protozoa infection in the Kedah and Perak samples could probably be due to the culture system as compared to the wild samples from Perak. The protozoa population will increase in water that contains excess organic matter caused by leftover feed, faecal matter and other organic wastes in the culture system (Zafran *et al.*, 1998). Protozoan infestations by *Zoothamnium* sp., *Acineta* sp. and *Vorticella* sp. could inhibit swimming, feeding and moulting in all the life stages of prawn (Fig. 2).

A gregarine of protozoa (*Nematopsis* sp.) with a prevalence of 68.75% was found in the wild samples from Perak (Fig. 3). Infection of leech cocoon was seen in most of the Kedah samples with a prevalence of 21.97% and a mean intensity of 45.55 cocoons per prawn (Fig. 4 and Table 1). In Perak, a higher prevalence of 35.8% with a mean intensity of 139.30 per prawn was recorded. However, no infection of leech cocoon was seen from the cultured prawn in Negeri Sembilan. Leeches and gregarines which used *M. rosenbergii* as one of the final host or intermediate hosts in the life cycle of the parasite usually have no significant effect on the adult prawn (Aldrich, 1965; Overstreet, 1972). In the present study, the role played by leech cocoon and the effect of the gregarine on adult freshwater giant prawn remains unknown.

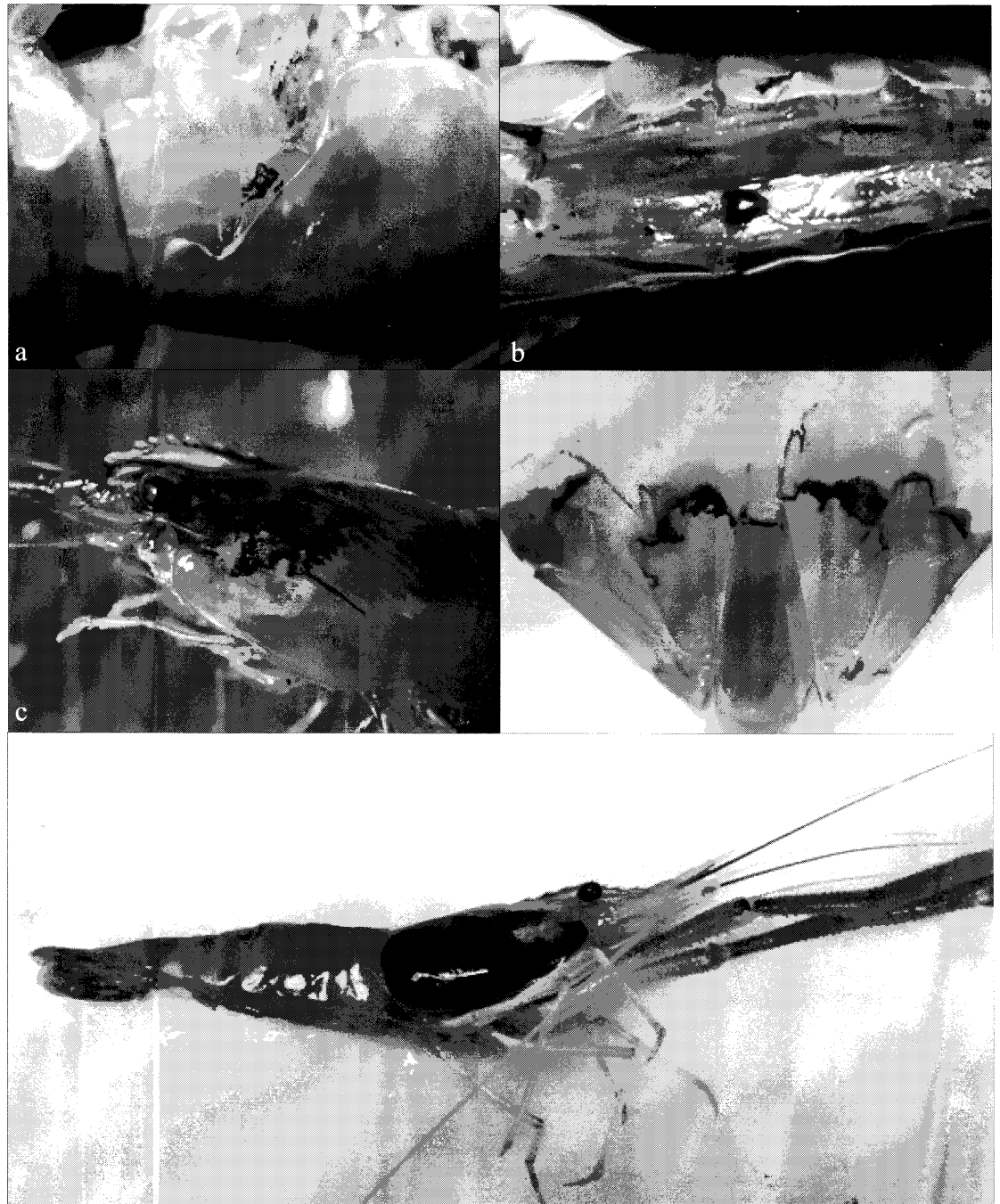
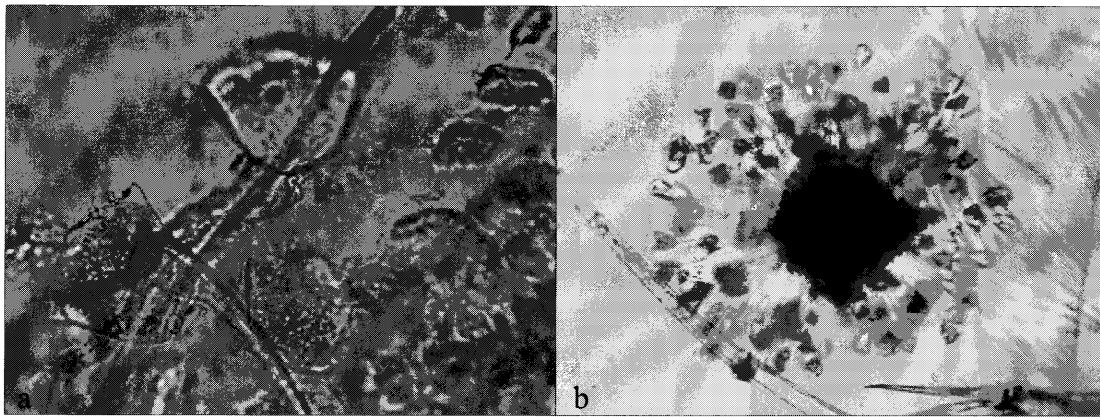
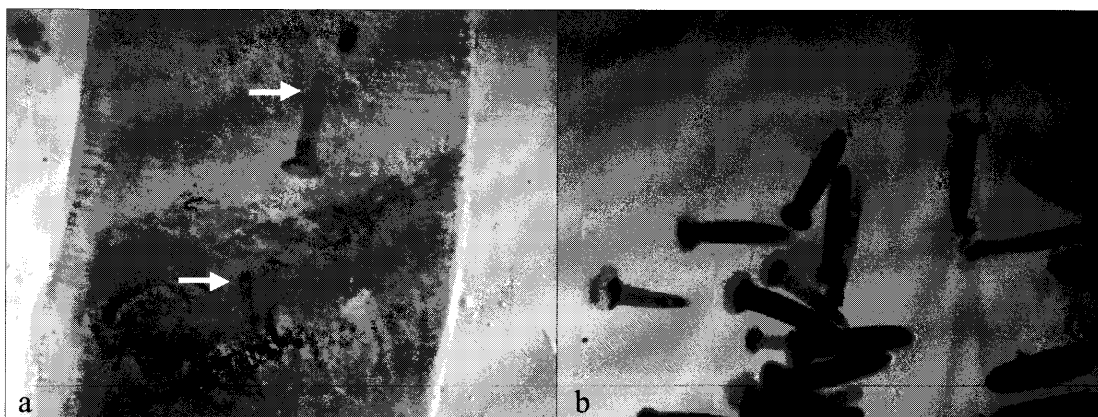


Figure 1: Symptom of black spots/patches on the examined sample. a: body, b: pleopod, c: carapace, d: telson and e: gill

Table 1: Prevalence of parasites found in the examined samples

Location	Number of prawn examined	Prevalence of black spots/ patches (%)	Parasitic examination	Prevalence (%)
Kedah	91	100	<i>Acineta</i> sp., <i>Zoothamnium</i> sp. and <i>Vorticella</i> sp.	100.00
			Cocoon of unidentified freshwater leech	21.97
Perak	34	100	<i>Zoothamnium</i> sp. and <i>Vorticella</i> sp.	75.00
			Gregarine (<i>Nematopsis</i> sp.)	68.75
			Cocoon of unidentified freshwater leech	35.80
Negeri Sembilan	49	18.37	<i>Acineta</i> sp., <i>Zoothamnium</i> sp. and <i>Vorticella</i> sp.	69.39

**Figure 2:** Protozoan infection found in gills of samples from Perak, Negeri Sembilan and Kedah. (a). *Acineta* sp. and (b). *Vorticella* sp.**Figure 3:** A gregarine of protozoa (arrow) (*Nematopsis* sp.) found in the hindgut of wild samples from Perak (a) and (b)

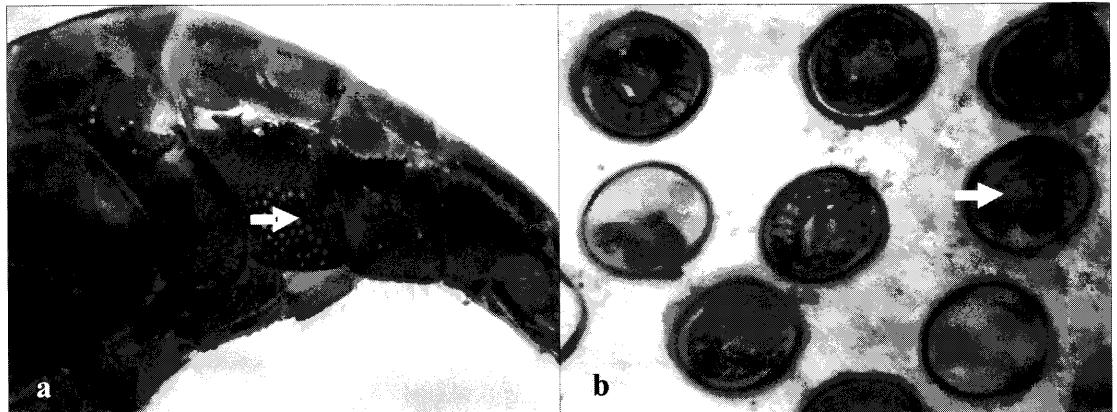


Figure 4: Cocoon (arrow) of unidentified freshwater leech found at the carapace of *M. rosenbergii*. (a). cocoon on body and (b). Individual of cocoon contained juvenile of leech under magnification of 200x

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