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INFESTATION OF *Probopyrus* sp. ON *Macrobrachium lanchesteri* FROM SUNGAI CHALOK AND SUNGAI NYATOH, TERENGGANU, MALAYSIA

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Abstract: The bopyrid isopod *Probopyrus* sp. is a common ectoparasite of *Macrobrachium lanchesteri* from Sungai Chalok and Nyatoh. A total of 1263 prawns were examined and only 38 prawns were infested by *Probopyrus* sp. There was no infestation of more than one bopyrid. The infestation was considered low (3.0%) from both rivers. However, prawn from Sungai Nyatoh showed higher infestation (4.61%) compared to Chalok river, 1.42%. The colour of cyst showed the stages of the eggs maturity such as light yellow, yellow, orange and dark orange. This present study showed the status of the *Probopyrus* sp. on *M. lanchesteri* from both rivers, Sungai Chalok and Nyatoh in Setiu.

Keywords: *Macrobrachium lanchesteri*, Setiu Wetlands, *Probopyrus* sp.

Introduction

The bopyrid isopod of the genus *Probopyrus* is a common ectoparasite of the branchial chamber of Palaemonidae prawn and *Macrobrachium* sp. as their definitive host (Page, 1985). Bopyrid isopods are haematophagous ectoparasites and a single mature female accompanied by a smaller male will normally parasitized the host. The body of the bopyrid is subcordate and slightly distorted. This genus commonly found in brackish to freshwater (Markham, 1985a). The genus *Probopyrus* includes 46 species with less than 30 species are valid and considered as *Probopyrus* sp (Markham, 1985b). The presence of *Probopyrus* is easily recognized because they induced a visible swelling in the host's branchiostegite (Marina *et al*., 2011). According to Torres-Garcia and Bortolini-Rosales (2002), the bopyrid isopods infected on the brachial chamber of the shrimp host are commonly seen on both right and left side. Behaviour and mobility of parasitized prawns by *Probopyrus* were less active than un-parasitized hosts (Bass & Weis, 1999). New and Valenti (2000) stated that *Probopyrus* are attached to the gill chamber and feed on the lymph hosts by perforating prawn's integument with the mandibles. The parasite infection such as from the family Bopyridae caused lower growth rate (Jay, 1988).

Macrobrachium lanchesteri is widely distributed in Asia especially in Southern and central Thailand, Peninsular Malaysia, Sabah, Singapore, Laos and Brunei (Chace & Bruce, 1993). The shrimp can be found in almost all types of freshwater bodies, rice fields, ponds, reservoirs, streams and rivers. This shrimp is popular among local people at Setiu wetland area especially during the monsoon season. According to fishermen, the catch and demand was higher during monsoon with the price of about RM18/kg. The *M. lanchesteri* infected by *Probopyrus* was reported by Wahidah *et al.* (2012) from Nyatoh River, Setiu, Terengganu. Thus, a study of parasitic organism which

infects this species is necessary to ensure prawn health status from the river. This is also important information for those who will use the water source from the river for freshwater shrimp farm nearby.

This study provides additional information on the presence of *Probopyrus* sp. from Sungai Chalok and Nyatoh.

Materials and Methods

In the course of investigation on parasites, a statistically significant number of samples of *M. lanchesteri* from two different rivers, Sungai Chalok (n=634) and Sungai Nyatoh (n=629) were obtained from local fisherman during the monsoon season in 2014. Infested prawns were recognized by a bulge in the shrimp's carapace either on the right or left brachial chamber and recorded. The colour of the protrusion varies and was observed. The infested and uninfested prawn were measured to the nearest centimeter (cm) and weighed to the nearest gram (g). All the samples were observed within 24 hours. The *Probopyrus* was collected and fixed in 70% alcohol.

Results and Discussion

A total 1263 prawns were examined and only 38 prawns were infested by *Probopyrus* sp. and no *M. Lanchesteri* was infected with more than one bopyrid. The prevalence of the infection is considered low at 3.0%. Prawn from Sungai Nyatoh showed high infestation, 4.61% compared to Sungai Chalok, 1.42%. The sizes were 4.0 to 6.9 cm in length from Chalok river and 5.0 to 6.9 cm in length from Nyatoh river. Data recorded showed that total frequency of prawn infected with *Probopyrus* sp. increased with the host weight (Figure 1).

In the present study, only 3% of *M. lanchestri* were infected with *Probopyrus* sp. and this condition is considered low infestation. The infestation of *Probopyrus* sp. showed higher infestation in group of shrimp with size 5.0 to 5.9

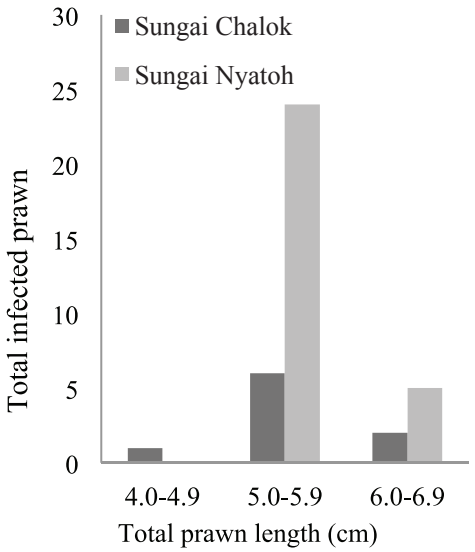

Figure 1: Frequency of *Probopyrus* sp. infestation on *Microbrachium lanchesteri* with the length of the prawn

cm from both rivers. There was no infestation of *Probopyrus* sp. from Nyatoh River on the shrimp size 4.0 to 4.9 cm. These results showed that the female bopyrid parasites infected their decapod crustacean hosts at the early stage. The bopyrid isopods attached on the branchiostegites wall inside the gill chamber and induced the large visible protuberances on gill chamber of the hosts. They live and grow together thereafter on their hosts. According to Cash and Bauer (1993), there was a significant positive correlation between female *P. pandalicola* parasite length and host length. The total number of infected prawn decreased with increasing size. Somers and Kirkwood (1991) showed that parasitized *Penaeus semisulcatus* by bopyrid parasite *Epipenaeon ingens* loss their parasites after two weeks of recapture. The other effect of *Probopyrus* was the reduction of egg number in infested female *Macrobrachium ohione* and there are indications of retarded growth or death of the host (Truesdale & Mermilliod, 1977). The female bopyrid attachment pressed the gills and reduced the function of the gills (Schuldt & Capitulo, 1985). Thus, the prawn has to respire with one functional gills chamber to survive. Although the infestation did not cause

immediate death, it affects the natural growth of the host prawn as discussed by Raman *et al*. (2005). The female bopyrids infested definitive hosts more frequently than males because the female are larger and live longer (Beck, 1979). Ayub and Ahmed (2004) reported the presence of male or eggs or both in the brood pouches of female bopyrids. In this study, we observed all the females together with male (Figures 2, 3, 4 and 5).

In this present study, all the female *Probopyrus* sp. were with eggs in the brood pouch. There were no *M. lanchesteri* with more than one female bopyrid found. The cysts colour was observed and several colour appeared to indicate the different stages of the eggs development. The colour varies from light yellow, yellow, light orange, dark orange and black (Figure 6). The carapace was removed and the parasite appeared at the gill lamellae.

Figure 2: *Probopyrus* sp. female. Ventral view.

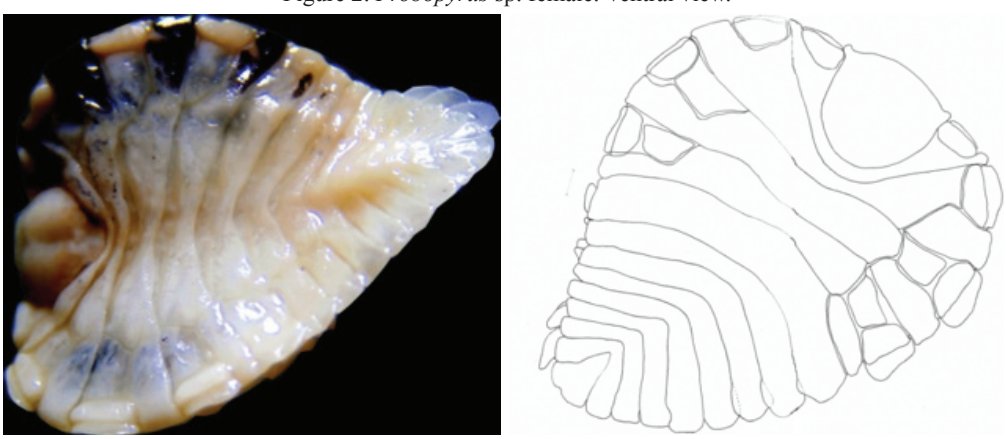

Figure 3: *Probopyrus* sp. female. Dorsal view.

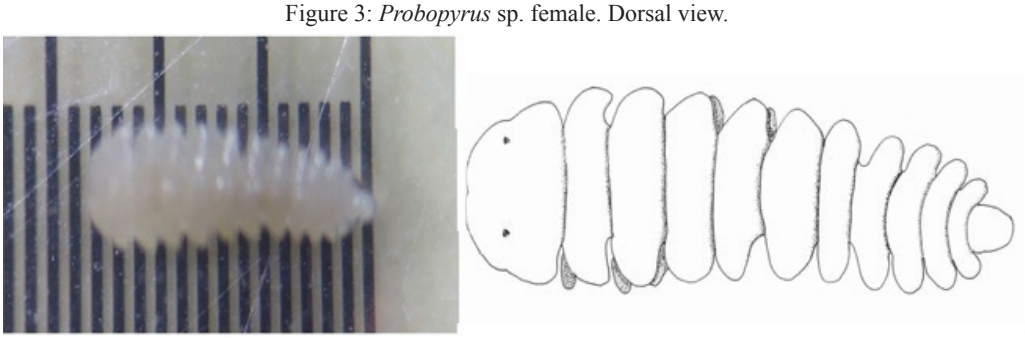

Figure 4: *Probopyrus* sp. male. Dorsal view

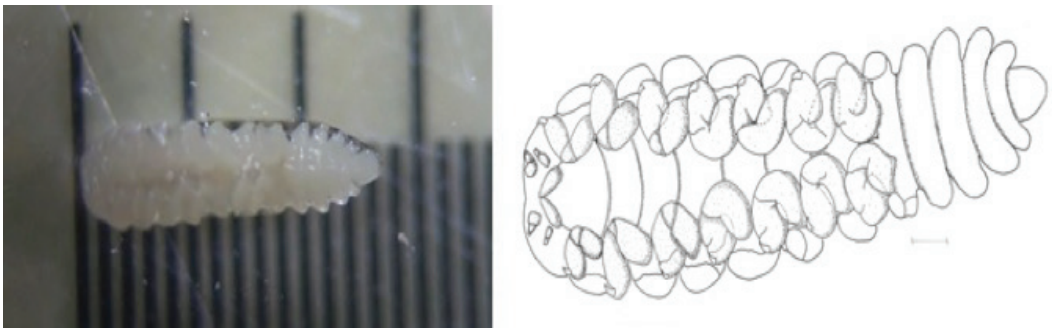

Figure 5: *Probopyrus* sp. male. Ventral view

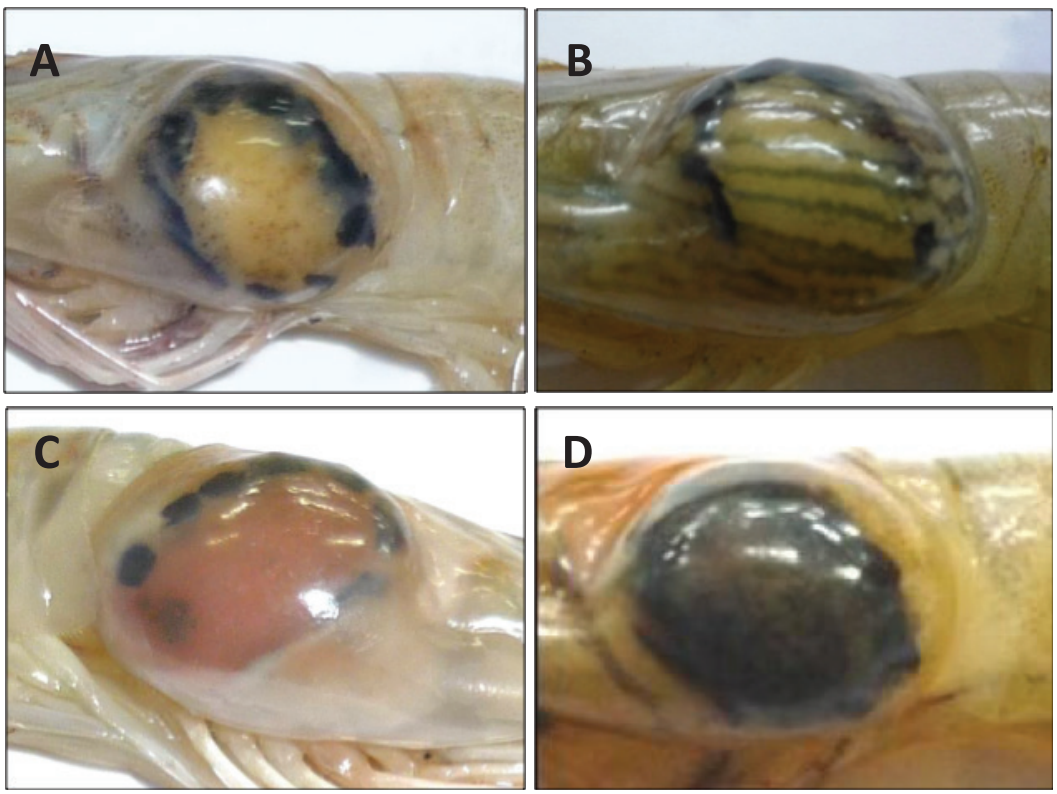

Figure 6: *Probopyrus* sp. cyst colour on the brachial chamber of *Macrobrachium lanchesteri* showing the stages of egg maturation. (A) light yellow; (B) yellow; (C) orange; (D) black with embyonated eggs

Flattening the gill lamellae and deformation of the carapace were noticed. Light yellow is the early stage and cyst in orange colour is in the middle stage of the eggs development. While, the black colour cyst is the embryonated eggs (Marina *et al*., 2011).

Conclusion

In conclusion, higher infestation of *Probopyrus* sp. was observed in *M. lanchesteri* of sizes between 5.0 - 5.9 cm of length from both rivers. The infestations decreased in prawns bigger than 5.9cm, which indicates the detachment of parasites or death of the host. The infestation rate in this study was considered low because only 3% of the samples (n=1263) were infested. Although the infested prawn did not die, the Probopyrid parasites pressed the gills and caused physiological changes. It effects the growth and the reproduction.

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