

## Muddled Muddies

### A look at the mud crab parasite *Loxothylacus ihlei*




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#### INTRODUCTION

Parasites survive by living in or on other animals (the hosts) which they rely on for nutrition and/or reproduction. *Loxothylacus ihlei* is a specialist parasite of the mud crab (*Scylla serrata*) and belongs to the family Sacculinidae, a group of organisms which infect crab species throughout the world. The life cycle of a sacculinid parasite begins with the free-swimming male and female larvae. When a female larva encounters a mud crab (of either sex) it injects a mass of cells, which form a root-like system (the interna) inside the body cavity of the crab. These cells, and in particular the chemicals they release, sterilise the crab and trigger the enlargement of the abdominal flap of males to a size comparable to that of females (Table 1).

The infection also spreads to the inner surface of the crab's abdominal flap, where an orange coloured sac, the externa – the mature female stage of the parasite, which resembles the egg mass of a berried female mud crab - develops (Figure 1). From this point on, chemicals released by the parasite stop the crab from moulting (thereby arresting growth) and trick it into looking after the externa as if it were its own eggs. The externa is later fertilised by the male sacculinid larva and the cycle is repeated.

**Table 1.** The underside of a normal male (left), parasitised male (centre) and mature female (right) mud crab mean sizes refer to crabs harvested from around Darwin and the Gulf of Carpentaria by crab fishers and NT Fisheries from June 1990 to December 1993

Normal male	Parasitised male	Normal female
		
Mean shell width = 154 mm	Mean shell width = 120 mm	Mean shell width = 155 mm
Mean wet weight = 854 g	Mean wet weight = 304 g	Mean wet weight = 608 g
Mean flap width = 25 mm	Mean flap width = 50 mm	Mean flap width = 55 mm

## OCCURENCE

*Loxothylacus ihlei* is found from near Darwin in the Northern Territory to Proserpine in Queensland and also in southern Indonesia. It has not been recorded from other parts of the Indo-West Pacific despite extensive fisheries for *S. serrata* in the region. However, further studies may reveal a wider distribution.



**Figure 1.** Parasitised male mud crab (left) and berried female mud crab (right)

Historical data from Van Diemen Gulf shows that the rate of *L. ihlei* infection varies during the year, peaking at ~7% in November. This may be because parasitised crabs are imitating the behaviour of mature females which are thought to migrate offshore (and are more easily caught) during this time. This may also explain why few infected crabs are caught in subsequent months.

## IMPLICATIONS

Because *L. ihlei* infection stunts growth and promotes feminisation of mud crabs, common management strategies, such as minimum size limits and female protection, enhance the survival of the parasite and could potentially diminish the reproductive capacity of the stock. Fortunately, the incidence of parasitised mud crabs appears relatively low when compared with crab fisheries elsewhere. As such, *L. ihlei* is not considered to be a threat to the fishery at present. Nevertheless, NT Fisheries has a monitoring program in place to detect changes in the infection rate so as to provide timely advice to management when necessary.

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