

Parasitism of the portunid crab, *Charybdis japonica* by the rhizocephalan barnacle, *Heterosaccus papillosus* in the western coast of Korea

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Introduction

Rhizocephalan barnacles are crustacean hosts in marine ecosystems (Hines et al., 1997; Walker, 2001). Parasitization by rhizocephalans can have significant negative effects on populations of commercially important species (Shields and Woods, 1993; Alvarez et al., 1999), but how these affects host population dynamics is largely unknown.

The portunid crab, *Charybdis japonica* is an important crustacean fishery resource in Korean waters. Although this crab have common occurrence and commercial importance, little is known about the population structure of the crab parasitized by the rhizocephalan barnacle.

The present study reports parasitic prevalence and some effects of parasitism of *H. papillosus* on population of *C. japonica* in the western coast of Korea.

Materials and Methods

A total of 3,118 specimens of *C. japonica* was collected in the vicinity of Boryeong, western coast of Korea, from May 1996 to October 1997 (January-April excluded). All crabs were measured, sexed, and examined for the presence of parasite. Carapace width and width of the fifth abdominal segment were measured with a digital caliper to the nearest 0.01 mm. The sex of each crab was determined from the shape of the abdomen. Each crab was classified according to four categories: normal, with externa, feminized and scarred. Molt stages were divided

into two classes: recently molted or intermolt crabs. Dissection for interna was not undertaken. Prevalence is used in the sense of Margolis et al. (1982) to mean the percentage of the total number of crabs examined which were parasitized. Statistical analyses (Bartlett's test, ANOVA, linear regression and ANCOVA) followed standard methods as described by Sokal and Rohlf (1995). Data for statistical analyses were log-transformed to reduce differences in the variances between groups. A value of $P < 0.05$ was accepted as significant.

Results and Discussion

The portunid crab, *C. japonica* is parasitized by a rhizocephalan barnacle identified as *H. papillosus*. Annual prevalence of infection was 3.85% in females and 1% in males. Female crabs were infested more often than males. The number of externa per host varied from 1-2, 86.36% of the parasitized crabs had one externa, and 13.64% had two.

Parasitism by *H. papillosus* influences the size and morphometry of *C. japonica* similar to other sacculinid infection (e.g. Reinhard, 1950; Hochberg et al., 1992). The mean size of crabs in three categories differed statistically (ANOVA, $F=7.79$, $df=2,99$, $P < 0.01$). Parasitized crabs were, on the average, smaller than normal crabs. The size range of parasitized individuals reflects the demographics of host vulnerability (O'Brien and Van Wyk, 1984). Size reduction in infected crabs was presumably a result of inhibition of molting once the parasite's externa developed (O'Brien and Skinner, 1990).

For each category, the regression for carapace width versus abdominal width was significant (ANOVA, $P < 0.01$). Abdominal width in females carrying externa was significantly wider than that of normal females (ANCOVA, $F=13.85$, $df=1,294$, $P < 0.01$). Changes in the abdominal width associated with parasitism probably facilitates survival and reproduction of the parasite (Weng, 1987).

References selected

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