FEATURES OF AN INTERSEX CHINESE MITTEN CRAB, *ERIOCHEIR JAPONICA SINENSIS* (DECAPODA, BRACHYURA)

BY

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INTRODUCTION

According to the review by Du (1987) a male of the mitten crab, *Eriocheir japonica* (De Haan, 1835), infected by *Polyascus gregaria* (Okada & Miyashita, 1935) (Cirripedia, Rhizocephala) (cf. Glenner et al., 2003) can have five types of an abnormal abdomen with abnormal pleopods. We describe herein a type of parasitism-related intersexuality that has previously not been reported for *Eriocheir japonica sinensis* (H. Milne Edwards, 1853) (cf. Tang et al., 2002, 2003b). A possible mechanism for the origin of the sexual aberrations found in this specimen is also presented.

The individual of *Eriocheir japonica sinensis* studied, shows degenerated male features as well as some slightly feminine characteristics, most probably as a result of a parasitic infection by *Polyascus gregaria*. Though parasitic castration has been reported extensively for many species of crabs (Reinhard, 1950, 1956; Høeg, 1984; O’Brien & Wyk, 1984; Sloan, 1984; Walker, 1985; Weng, 1987; O’Brien & Skinner, 1990; Walker et al., 1992; Alvarez et al., 1995; Grosholz & Ruiz, 1995; Glenner & Werner, 1998; Thresher et al., 2000; Torchin & Mitchell, 2004), we nevertheless consider it important to document the present find in some detail. This is because, in our opinion the features of this specimen allow, to some extent, to trace the possible mechanisms that cause the condition of sexual degeneration under the influence of the parasite.

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An intersex individual of *Eriocheir japonica sinensis* was found on Chongming Island, Shanghai, on 25 September 2002. It was dissected and the remains were fixed in 70% ethanol. The fresh ejaculatory duct, along with that of a normal, similar-sized male of the same species, was fixed in Bouin’s fixative, dehydrated in an ethanol series, and embedded in paraplast. Serial cross sections were stained with haematoxylin-eosin. These histological sections were examined and photographed with a Leica DMLB compound microscope.

The first and second antennae were examined with a scanning electron microscope, for which samples from the antennae were dehydrated in a graded ethanol series, then critical-point dried in liquid CO₂. The dried samples were mounted on brass stubs, sputter-coated with gold, and examined in a Jeol JXA-840 SEM.

The intersex *Eriocheir japonica sinensis* has a capapace width of 60 mm and a carapace length of 55 mm. It was infected by the rhizocephalan, *Polyascus gregaria*. *Polyascus* individuals as well as some holes produced by the infection, were found in the abdomen (fig. 1) and in the coelomic cavity. The abdomen is subrectangular in shape (fig. 2), which is intermediate between that of a typical male, i.e., triangular, and that of a typical female with a large, rounded abdomen. The first pairs of pleopods resemble the gonopods of a similar-sized, typical male (fig. 1) and there are no other appendages than those first and second pairs of pleopods on the abdomen. No female genital apertures were found on the sternum (fig. 1). The manus and the basal portions of the chelipeds are covered with the usual tomentum on both the inner and outer surfaces, but that hair cover is thinner than that of a similar-sized, typical male (fig. 2). The endopodite of the first antenna has only 4 segments compared with 5 segments for a normal male (fig. 3). The four distal segments of the second antenna (fig. 4) are also abnormal: the apical segment is subcylindrical rather than conical, and there are no aesthetascos on the tip of the apical segment, as there are in a typical male crab. Some long, sensory setae are found on the surface of the 2nd and 3rd segments of the second antenna of this intersex crab, whereas these are lacking in a normal crab with a carapace width of 60 mm. We also found a half-developed segment between the ninth and tenth segments of the second antenna (fig. 5).

The male reproductive system of this intersex individual is much degenerated, with both the testis and the accessory glands being virtually non-existent (fig. 6).