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Occurrence of the Chinese Mitten Crab, *Eriocheir sinensis* H. Milne Edwards, in Tokyo Bay, Japan

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Abstract In November 2004, two mature females of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853 (Crustacea, Decapoda, Brachyura, Grapsidae), were found in Tokyo Bay, central Japan. This Chinese species is widespread in European countries and North America, but has been unknown from Japanese waters.

Key words : Chinese mitten crab, *Eriocheir sinensis*, Tokyo Bay, Japan.

In recent years, it is known that many marine invertebrates were introduced to Japan intentionally or brought overseas accidentally together with human activities. As for the crabs from Japanese waters, the occurrence of *Pyromaia tuberculata* Lockington (Majidae) from California and *Carcinus mediterraneus* Czernaivsky (Portunidae) from the Medeterranean have been reported by Sakai (1971, 1986), and at present it is well known that both species are commonly found in Tokyo Bay and adjacent seas probably due to specific strong vitality and vacant niche without native species of similar habit and habitat. The blue crab, *Callinectes sapidus* Rathbun (Portunidae), has even been recorded by Sakai (1976) from Hamana Lake and by Ariyama (1985) from Osaka Bay, central Japan, and the dungeness crab, *Cancer magister* Dana (Cancridae), by Abe (1981) from off Kushiro, the Pacific coast of Hokkaido, but they seem not to be successful with settlement in Japanese waters. On the other hand, Williams and McDermott (1990) first reported the occurrence of the Western Pacific crab, *Hemigrapsus sanguineus* (de Haan) (Grapsidae) in New Jersey, the Atlantic coast of North America, and at present, this shore crab, common in the entire coasts of Japan, the Korean Peninsula and China is not uncommon in the Atlantic coast of North America (Ahl & Moss, 1999; Ledesma & O'Connor, 2001) and also extended its distribution to Europe (Breton *et al.*, 2002).

On November 9, 2004, the junior author caught a live female of *Eriocheir sinensis* H. Milne Edwards (Grapsidae) during field operation in transplantation of *Zostella* at subtidal sands off Odaiba, the bottom of Tokyo Bay. There are many craters lying around dug by a fish species of ray on the sandy bottom, and the crab was found close to one of rocks dispersed and partly embedded in the sea grass bed. He brought the crab on the beach and took two shots of the female, dorsal and ventral views, but unfortunately, the female ran away from his hand. As seen in the photographs reproduced in this report (Figs. 1A, B), the female attains ca. 8 cm in carapace breadth, with a fully developed abdomen. Fortunately, one of the photographs, the dorsal view, demonstrates the specific characters for discrimination of the species from the congeners.

On November 25, 2004, he also found a dead female (71.5×66.5 mm in breadth and length of carapace, respectively) which is now preserved as a voucher in the National Science Museum, Tokyo (Fig. 1C; NSMT-Cr 16096). The specimen

Fig. 1. *Eriochier sinensis* H. Milne Edwards from Tokyo Bay. A, B. Living female (exact size was not recorded); C, dead female (71.5 mm in breadth and 66.5 mm in length).

was found close to the plastic fence surrounded the transplanted *Zostella* for protection, being in a good condition immediately after the death, with fresh color of moss green.

At first sight the female specimen and photographs are different from *Eriocheir japonica* (de Haan) in having four anterolateral teeth and the apparently sharper anterolateral and frontal teeth, and were identified with *E. sinensis* H. Milne Edwards, 1853 from northern China and Korea, not with *E. hepuensis* Dai, 1991 from southern China, based on an important contribution by Guo *et al.* (1997) who re-evaluated this species described originally as a subspecies from southern China. As for the year (1853 or 1854) of the original description of *E. sinensis*, we followed Manning and Holthuis (1981) who offered the well-informed explanation. Even though Guo *et al.* (1997) summarized the differences between both species in the table after extensive discussion, the identification of the specimens seems to be not always easy. There may be differences as such indicated by them in the convexity of the carapace, the state of the frontal teeth, epigastric and protogastric crests, distal tooth of the cheliped, the proportion of the cheliped merus, fourth leg propodus and dactylus, and abdomens of both sexes, and the shape of the first male pleopod and female vulva. The female specimens from Tokyo Bay were identified with *E. sinensis* chiefly based on the shape of the frontal teeth and telson of the female abdomen.

The Chinese mitten crab, *E. sinensis*, is well known as a delicious edible crab in Japan as well as in China and Korea, and in late autumn and winter, numerous numbers of crabs are imported to Japan from China under the Japanese name of Shanhai-gani, which originates from the name of port for exportation, Shanghai, and the general name of crabs in Japanese, gani (=kani). Recently, some farmers in northern Japan started on culture of the Chinese mitten crab instead of the Japanese mitten crab. At present it is reputed to be no problem in management of small crabs during transportation of young crabs from China and culture in the paddy field in Japan.

Numerous papers on *Eriocheir sinensis* were published chiefly by the Chinese researchers not only in the biological and biogeographical studies but also the environmental disturbance caused by the crabs (cf. Zool. Rec., Crustacea). It is reported that *E. sinensis* has been found first in the Weser River system in 1912 and then had appeared as a by-catch in the flounder fisheries by the mouth of the Elbe since about 1915 (Peters & Panning, 1933; Panning, 1939). It is widely spread in European countries (Christiansen, 1969; Clark *et al.*, 1998; Herborg *et al.*, 2003) and also in North America (Nepszy & Leach, 1973; Cohen & Carlton, 1997; Rudnick *et al.*, 2003). It is impossible to demonstrate the source of the present occurrence in Tokyo Bay whether someone stocked deliberately in the sea with the crabs, or young crabs were accidentally released from ballast water of cargo boat from China, but it is highly probably that *E. sinensis* or *E. herpensis* will be able to establish their ecological status in the niche of *E. japonicus*.

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