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First confirmed record of the Chinese mitten crab (*Eriocheir sinensis*) from the River Tyne, United Kingdom

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Two specimens of the Chinese mitten crab *Eriocheir sinensis* (Crustacea: Decapoda: Brachyura) were caught in the River Tyne, north-east England during 2001. The specimens were brought back to the laboratory, sexed, measured and stored in 95% ethanol. Unconfirmed reports of this species' occurrence in the River Tyne were first circulated in 1997.

The Chinese mitten crab, *Eriocheir sinensis* (H. Milne Edwards, 1854) is an invasive species so far only reported in Britain from the River Thames (Clark et al., 1998) and Humber (Clark, 1984). This species is catadromous, spending most of its life in freshwater where it grows to adulthood only returning to estuaries to reproduce (Peters, 1933). The absence of native decapod crustaceans of comparable size in freshwater habitats in Europe allowed the Chinese mitten crab to become a successful invader, earning it a place amongst the '100 of the world's worst invasive alien species' list published by the invasive species specialist group (Lowe et al., 2000).

Route, manner and impact of invasion

The Chinese mitten crab originates from the Far East, where it ranges from Hong Kong ~22°N to the border of North Korea ~40°N (Hymanson et al., 1999). From there it has spread via ballast water (Peters, 1933) (Cohen & Carlton, 1997) to Europe and the USA. The Chinese mitten crab has been shown to have negative impacts on fishing (Ingle, 1986), (Veldhuizen & Stanish, 1999) river banks (Dutton & Conroy, 1998) and native fauna (Clark et al., 1998).

Invasion of continental Europe and the USA

European reports from the first half of the last century illustrate the invasive ability of *E. sinensis*. After the first record in 1912 in North Germany (Peters, 1933), the species began to spread in the 1930s throughout most of Europe, entering Denmark (1927) (Peters, 1938), the Netherlands (1930) (Kamps, 1937), France (1930) (Hoeslandt, 1948), Poland (1932) (Peters, 1938), and in 1932 as far upstream as Prague in the Czech Republic ~700 km inland (Peters, 1938). In the 1960s it migrated into the Mediterranean through the river system of the Garonne (Petit & Mizoule, 1974). A similar spread of the Chinese mitten crab is ongoing in San Francisco Bay (USA) (Hieb & Veldhuizen, 1998).

Despite these major invasions in continental Europe, only two Chinese mitten crabs were recorded in Britain before the 1970s (Ingle & Andrews, 1976), thereafter a population became established in the River Thames (Clark et al., 1998) (Robbins et al., 1999).

Figure 1. A large male specimen of *Eriocheir sinensis*, carapace width 75 mm. Note the fur like hairs covering the chelipeds, which gives this species a very distinct appearance.

Assessment of the Tyne population

Following two unconfirmed records of mitten crabs being caught at Newburn and Derwenthaugh in the River Tyne in 1997 (C.D. Dutton, personal communication) (Mellors, personal communication), a combined public awareness and trapping programme was undertaken to assess the population in the River Tyne.

The catching programme extended from March–November 2001, using commercial crayfish traps as well as a single beam trawl towed by the RV 'Bernicia' in August, which is the beginning of the reproductive season. Both methods yielded large numbers of *Carcinus maenas* but no mitten crabs.

After several items in the local media, the first live specimen of *E. sinensis* was received on 4 June 2001. This specimen was a large female with a carapace width of 60 mm. When dissected it was found to have ripe ovaries. The animal was caught in a used car tyre in the lower part of the estuary, within Walker Riverside Park. These are frequently used as artificial refuges for *C. maenas* by bait collectors. Another live female *E. sinensis* of carapace width 57.5 mm was caught by a local eel-fisherman on 11 October 2001, 300 m downstream of the Redheugh Bridge. He also reported that he had caught small numbers of mitten crabs in his nets annually in the Tyne since 1999. Eel-fishermen are likely to be the best source of information for a population assessment in the Tyne, due to the absence of power stations and other water extracting plants as used by Clark et al. (1998) in the Thames. Another great advantage is the expertise of the eel-fishermen in combination with the very distinctive appearance of mitten crabs in comparison to *C. maenas*, and other estuarine crab species. *Eriocheir sinensis* can be clearly distinguished by its hexagonal body shape, long walking legs (~ 2× the carapace width), its olive green colour, and most importantly, by the fur-like hair on the chelipeds (see Figure 1).

Conclusion

Based on the finding of two sexually mature females as well as repeated unconfirmed reports of this species in the river since 1997, the River Tyne seems to be at an early stage of invasion by *E. sinensis*.

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