Eriocheir sinensis

Taxon	Family / Order / Class / Phylum
Eriocheir sinensis H. Milne Edwards, 1853	Varunidae / Decapoda / Malacostraca / Arthropoda

COMMON NAMES (English only)
Chinese mitten crab
Chinese freshwater edible crab
Shanghai crab
Chinese river crab

SYNONYMS
Eriocheir leptognathus Rathbun
Eriocheir rectus Stimpson

SHORT DESCRIPTION
This small crab has a carapax that might may reach 5 cm and are usually brownish in colour. A characteristic feature is the mitten like "fur" on the claws. The Chinese mitten crab is an omnivorous predator. The diet of the crabs includes a wide range of plants, invertebrates, fishes and also detritus. Gastropods and bivalves are the dominant food component.

***Eriocheir sinensis* adult male**

Photo: Stephan Gollasch

BIOLOGY/ECOLOGY

Dispersal mechanisms
Larvae disperse with water currents, juveniles and adults show active migration. Crabs even cross dikes and streets.

Reproduction
The life-cycle is characterised by migrations to waters of different salinities. Larval stages occur in marine and higher saline estuarine waters. The upstream larvae migration (in spring) is supported by currents in estuaries. Juveniles actively migrate upstream over very long distances (up to 1,500 km inland in China). Adults migrate downstream to the marine environment in summer. This migration may take several months, during which they become reproductively mature. Most crabs live for two years, rare specimens grow older. After one year, the crabs reach full size. Mass developments were reported frequently in the last Century.

Known predators/herbivores
Crabs are preyed upon by birds.

Resistant stages (seeds, spores etc.)
None.

HABITAT

Native (EUNIS codes)
A1: Littoral rock and other hard substrata, A2: Littoral sediments, A3: Sublittoral rock and other hard substrata, A4: Sublittoral sediments, B1: Coastal dune and sand habitats, B3: Rock cliffs, ledges and shores, including the supralittoral, C1: Surface standing waters, C2: Surface running waters, C3: Littoral zone of inland surface waterbodies. Larger estuaries and inland waters, hard and soft bottom habitats.

Habitat occupied in invaded range (EUNIS codes)
A1: Littoral rock and other hard substrata, A2: Littoral sediments, A3: Sublittoral rock and other hard substrata, A4: Sublittoral sediments, B1: Coastal dune and sand habitats, B3: Rock cliffs, ledges and shores, including the supralittoral, C1: Surface standing waters, C2: Surface running waters, C3: Littoral zone of inland surface

waterbodies. Larger estuaries and adjacent waters. Due to its inland migration it colonizes lakes and streams hundreds of kilometres from the sea.

Habitat requirements

The crabs are highly tolerant to water temperature changes. The temperature tolerance goes down to freezing point. High salinity tolerance is shown by the migration into marine, brackish and freshwater habitats. The species tolerates low oxygen conditions and air exposure for several hours.

DISTRIBUTION

Native Range

Temperate and tropical regions between Vladivostock (Russia) and South China, including Japan and Taiwan. Centre of occurrence is the Yellow Sea.

Known Introduced Range

First recorded from the German river Aller in 1912. The species probably spread into the Baltic Sea via the Kiel Canal and reached the German Baltic coast in 1926. The greatest abundance in Europe is in the Elbe, Weser and Thames and adjacent waters. It is also found in all North and Baltic Seas countries, the Atlantic seaboard of Europe and in the Mediterranean and Black Seas.

Trend

Although the crabs colonised already a wide distribution area in Europe, they continue to spread and new records are reported each year, predominantly in northern Europe.

MAP (European distribution)

Legend

	Known in country		Known in CGRS square		Known in area
	Key distribution area		Uncertain establishment		Unestablished
	Known along coast				

INTRODUCTION PATHWAY

The most likely introduction vector is shipping (ballast water and hull fouling of vessels) or imports of living species for aquaria and for human consumption. Range extensions (secondary spread) are aided by the enormous migrational behaviour of the species.

IMPACT

Ecosystem Impact

It competes for space and food especially during mass developments.

Health and Social Impact

The crabs are the second intermediate host for the human lung fluke parasite in Asia (no lung fluke record in crabs in Europe).

Economic Impact Crabs

damage nets by feeding on fishes caught in traps and nets. In freshwater ponds the crabs feed on cultured fish and their food as well. The burrowing activities of crabs result in increased erosion of dikes, river and lake embankments. They can also clog up industrial water intake filters during mass occurrences. In some European countries crabs are imported for human consumption. In Asia the crabs are considered a delicacy and in certain European regions adult crabs, caught as by-catch in inland fisheries, are sold to Asian restaurants. They have been also used as fishing bait, for fish meal production, cosmetic products and human consumption.

MANAGEMENT

Prevention

The species is known as delicacy and is traded on Asian markets for human consumption. Release in the wild should be avoided.

Mechanical

Attempts to catch as many juvenile crabs as possible during their upstream migration have been undertaken, especially during mass developments. However, trapping of crabs has not been found to be effective in controlling crab populations.

Chemical

Unknown.

Biological

Unknown.

REFERENCES

Gollasch S (1999) *Eriocheir sinensis* (Milne-Edwards, 1854), the Chinese Mitten Crab. In: Gollasch S, Minchin D, Rosenthal H, Voigt M (eds) Exotics Across the Ocean. Case histories on introduced species: their general biology, distribution, range expansion and impact. Logos Verlag, Berlin, pp 55-60

Ojaveer H, Gollasch S, Jaanus A, Kotta J, Laine AO, Minde A, Normant M, Panov V (in press) Chinese mitten crab *Eriocheir sinensis* (H. Milne-Edwards, 1853) (Crustacea, Decapoda, Varunidae) population in the Baltic Sea – a supply-side invader? Biological Invasions

Schnakenbeck W (1924) Ueber das Auftreten chinesischer Krabben in der Unterelbe. Schriften für Süßwasser- und Meereskunde 5

OTHER REFERENCES

Anger K (1990) Der Lebenszyklus der Chinesischen Wollhandkrabbe (*Eriocheir sinensis*) in Norddeutschland: Gegenwärtiger Stand des Wissens und neue Untersuchungen. Seevögel 11(2):32-37

Arndt W (1931) Die Tierwelt des Nordostseekanals und ihr Lebensraum. Der Naturforscher 8(4):113-118

Belgian Biodiversity Platform 2006 (http://biodiversity/thematic-forums/invasive-alienspecies/species).

Boettger CR (1933) Die Ausbreitung der Wollhandkrabbe in Europa. Sitzungberichte der Gesellschaft naturforschender Freunde, Berlin, pp 399-415

Cabral H, Costa MJ (1999) On the occurrence of the Chinese mitten crab *Eriocheir sinensis* in Portugal (Decapoda Brachyura). Crustaceana 72(1):55-58

Christiansen ME (1977) Kinesisk ullhåndkrabbe funnet for første gang i Norge. Fauna(Oslo) 30:134-138

CIESM Atlas of Exotic Species in the Mediterranean. Vol. 2 - Crustaceans decapods and stomatopods (assessed at www.ciesm.org/atlas)

Cigoña EF de la, Ferreira S (1996) Tres Crustáceos del Bajo Miño: el carangrejo chino *Eriocheir sinensis*; el carangrejo de río Ibérico *Austrapotamobius pallipes* y el carangrejo de río Americano *Procambarus clarkii*. Actas do I Simpósio Ibérico sbre a bacia Hidrográfica do rio Minho, 26-28 Junho de 1996, Vila Nova de Cerveira, Portugal.

Clark PF, Rainbow PS, Robbins RS, Smith B, Yeomans WE, Thomas M, Dobson G (1998) The alien Chinese mitten crab, *Eriocheir sinensis* (Crustacea: Decapoda: Brachyura), in the Thames catchment. Journal Marine Biology Association U.K. 78:1215-1221

Clark PF (1984) Recent records of alien crabs in Britain. Naturalist 109:111-112

Cuesta JA, González-Ortegón E, Rodríguez A, Baldó F, Vilas C, Drake P (2006) The decapod crustacean community of the Guadalquivir Estuary (SW Spain): Seasonal and inter-year changes in community structure. Hydrobiologia 557:85-95

Devin S, Bollache L, Noel PY, Beisel J-N (2005) Patterns of biological invasions in French freshwater systems by non-indigenous macroinvertebrates. Hydrobiologia 551:137–146

Eno NC, Clark RA, Sanderson WG (1997) Non-native Species in British Waters: a Review and Directory. Joint Nature Conservation Committee, Peterborough, pp 152

Fladung E (2000) Untersuchungen zur Bestandsregulierung und Verwertung der Chinesischen Wollhandkrabbe (*Eriocheir sinensis*). Schriften des Instituts für Binnenfischerei e.V. Potsdam-Sacrow 5:1–82

Gollasch S, Rosenthal H (2006) The Kiel Canal. In: Gollasch S, Galil BS, Cohen A (eds) Bridging Divides – Maritime Canals as Invasion Corridors. Springer, Dordrecht, The Netherlands, pp 5-90

Gollasch S (1996) Untersuchungen des Arteintrages durch den internationalen Schiffsverkehr unter besonderer Berücksichtigung nichtheimischer Arten. Diss., Univ. Hamburg, Verlag Dr. Kovac, Hamburg, p 314

Gomiou MT, Alexandrov B, Shadrin N, Zaitsev Y (2002) The Black Sea- a recipient, donor, and transit area for alien species. in Leppakoski E, Gollasch S, Olenin S (eds) Invasive aquatic species of Europe: Distribution, impacts, and management.. Kluwer Academic Publishers. Dordrecht, The Netherlands, pp 341-350

Goulletquer P, Bachelet G, Sauriau PG, Noel P (2002) Open Atlantic Coast of Europe - A Century of Introduced Species into French Waters. In: Leppäkoski E, Gollasch S, Olenin S (eds) Invasive Aquatic Species of Europe: Distribution, Impacts and Management. KLUWER Academic Publishers, Dordrecht, The Netherlands, pp 276-290

Hopkins CCE (2001) Actual and potential effects of introduced marine organisms in Norwegian waters, including Svalbard. Norwegian Directorate for Nature Management. Research Report 2001-1. pp 53

ICES, WGITMO 2005. Report of the ICES Working Group on Introductions and Transfers of Marine Organisms, pp 173

Ingle F (1986) The Chinese Mitten Crab *Eriocheir sinensis* H. Milne-Edwards - a contentious immigrant. The Lond. Naturalist 65:101-105

Jansson K (1994) Unwanted Aquatic Organisms In Ballastwater. IMO, MEPC36/INF.20, pp 68

Jensen K, Knudsen J (2005) A summary of alien marine invertebrates in Danish waters. Oceanological and Hydrobiological Studies. Vol. XXXIV, Supplement 1,137-162

Jogi E (2000) The uncommon Chinese mitten crab is swimming in the Mõdriku reservoir. Retrieved from http://arhiiv2.postimees.ee:8080/leht/00/04/22/

Leppäkoski EJ (1991) Introduced species - Resource or threat in brackish-water seas? Examples from the Baltic and the Black Sea. Marine Pollution Bulletin 23:219-223

Luther A (1934) Über die ersten in Finnland gefundenen Exemplare der Wollhandkrabbe (*Eriocheir sinensis* MILNE-EDW.). Memo. Soc. Fauna Flora Fennica, 10:69-73

Marquard O (1926) Die Chinesische Wollhandkrabbe, *Eriocheir sinensis* MILNE-EDWARDS, ein neuer Bewohner deutscher Flüsse. Fischerei, 24:417-433

Michaelis H, Reise K (1994) Langfristige Veränderungen des Zoobenthos im Wattenmeer. In: Lozán JL, Rachor E, Reise K, Westernhagen von, H, Lenz W (eds) Warnsignale aus dem Wattenmeer. Bd. 2, Blackwell Wissenschafts-Verlag, Berlin, pp 106-116

Normant M, Chrobak M, Skóra KE (2002) The Chinese mitten crab *Eriocheir sinensis* – an immigrant from Asia in the Gulf of Gdańsk. Oceanologia 44(1):124-126

Nyman M (1993) Introducerade arter i Bottniska viken. Diss. Dept. Biol., Abo Akademi Univ, pp 42

Panning A, Peters N (1932) Wollhandkrabbe und Elbfischerei. Hamburger Nachrichten 6:1-16

Panning A (1938) The Chinese Mitten Crab. Smithsonian Rep. 361-375

Panning A (1950) Der gegenwärtige Stand der Wollhandkrabben-frage. Neue Ergebnisse und Probl. Zoology 719-732

Panning A (1952) Die chinesische Wollhandkrabbe. Die neue Brehm-Bücherei, 70:1-46

Panov VE (2006) First record of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853 (Crustacea, Decapoda, Varunidae) from Lake Ladoga, Russia. Aquatic Invasions 1:28-31

Peters N (1933) B. Lebenskundlicher Teil. Pages 59-156 in Peters, N. and A. Panning, editors. Die chinesische Wollhandkrabbe (*Eriocheir sinensis* H. MILNE-EDWARDS) in Deutschland. Akademische Verlagsgesellschaft mbH, Leipzig, pp 59-156

Peters N, Panning A, Thiel H, Werner H, Schmalfuß H (1936). Die chinesische Wollhandkrabbe in Europa. Der Fischmarkt 4/5:1-19

Petit G (1960) Le crabe chinois est parvenu en Méditerranée. Vie et Milieu 11:133-136

Petit G, Mizoule R (1973) En douze ans le "Crabe chinois" n'a pu réussir son implantation dans les lagunes du Languedoc. *Vie et Milieu*, série C, biologie terrestre 23(1)[1972]:181-186

Redeke HC (1932) De Chineesche wolhandkrab, Eriocheir sinensis (Milne Edwards) in ons land. Levende Natuur 37:41-46

Sukopp H, Brande A (1984) Beiträge zur Landschaftsgeschichte des Gebietes um den Tegeler See.Sitzungsberichte der Gesellschaft Naturforschender Freunde Berlin 24:198-214

Wolff WJ (2005) Non-indigenous marine and estuarine species in The Netherlands. Zoologische Mededelingen 79-1:1-116

Zaitsev Y, Öztürk B (2001) Exotic species in the Agean, Mamara, Black, Azov and Caspian Seas. Turkish Marine Research Foundation, Istanbul, Turkey, pp 265

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Date Last modified: October 30th 2006