NOBANIS –Invasive Alien Species Fact Sheet

Eriocheir sinensis

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Species description

Scientific names: *Eriocheir sinensis* (Milne-Edwards, 1853), (Brachyura, Decapoda)
Synonyms: unknown
Common names: Chinese Mitten Crab (GB), Chinese Freshwater Edible Crab (GB), Crabe Chinois (FR), Chineesche Wolhandkrab (NL), krab čínsky (CZ), Chinesische Wollhandkrabbe (DE), Kinesisk uldhåndskrabbe (DK), hiina villkäpp-krabi (EE), Kinesisk Ullhåndskrabbe (NO), Kinesisk Ullhandskrabba (SE), Villasaksirapu (FI), Krab wełnistoszczypcy (PL), Kinijos Krabas (LT), Ķīnas cimdiņkrabis (LV), Kitajskij mokhnatorukij krab (RU).

Fig. 1. Adult crab *Eriocheir sinensis*, photo by Stephan Gollasch, www.gollaschconsulting.de

Fig. 2. Juvenile *Eriocheir sinensis* crabs during mass migration in Geesthacht (near Hamburg, Germany) in 1998, photo by Stephan Gollasch, www.gollaschconsulting.de.

Species identification

The square shaped carapace clearly distinguishes this invasive species from other European brachyuran crabs. It can reach a carapace width of 5 -7cm, but the maximum carapace width of the adult mitten crab is approximately 10 cm (Czerniejewski *et al.* 2003). One key identification feature is the hair-like covering on the claws, especially well developed in male individuals. The colour varies from yellow to brown, rarely purple. After reaching a size exceeding approximately 10-20 mm in carapace width, the male and female crabs can be differentiated by the shape of the abdomen which in the female is rounded and occupies most of the area of the thorax. In the male, the abdomen is narrower and shaped like an inverted funnel.

Native crabs lack dense hairy claw covering and a square shaped carapace. No similar species occurs in the Baltic region.

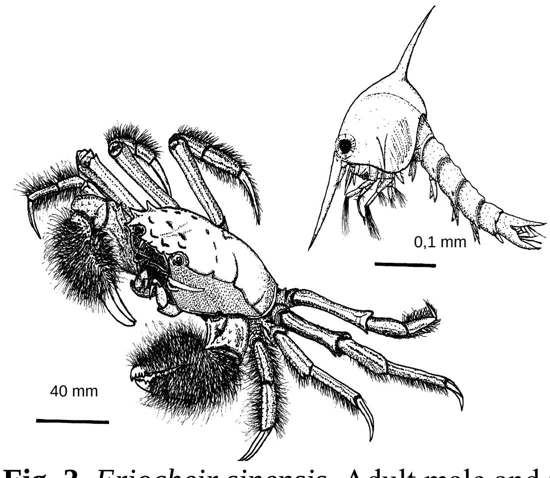

Fig. 3. *Eriocheir sinensis*. Adult male and zoea-larva. Drawing courtesy of Gollasch *et al.* 1999.

Native range
Area of origin are waters in temperate and tropical regions between Vladivostock (RU) and South-China (Peters 1933, Panning 1938), including Taiwan. Centre of occurrence is the Yellow Sea (temperate regions off North-China, see open circle on world map) (Panning 1952).

Fig. 4. World-wide distribution of *Eriocheir sinensis.* Drawing courtesy of Gollasch *et al.* 1999.

Alien distribution

History of introduction and geographical spread.
The crab was first recorded from the German river Aller in 1912 and may have been introduced with ballast water releases. Its establishment was influenced by the suitable climate and salinity conditions and the lack of competition from other species. Before the arrival of *E. sinensis* in Europe, no native brachyuran crab migrated between coasts and inland waters. Specimens have been found 700 km upstream the River Elbe in Germany. The species probably spread into the Baltic Sea via the Kiel Canal (first record on the German Baltic coast in 1926 and on the Polish Baltic coast in 1928).The greater abundance in Europe is in estuaries adjacent to the North Sea, *i.e* Ems, Elbe and Weser rivers (DE), Rhine River (NL), Thames River (GB) and Vidaa (DK) (Schnakenbeck 1924, Boettger 1933, Jensen 1936, Kaestner 1970, Sukopp and Brande 1984, Ingle 1986, Anger 1990, Reise 1991, Zibrowius 1991, Michaelis and Reise 1994, Clark *et al.* 1998) where mitten crabs have become extremely abundant. Mitten crabs have become established in Europe at latitudes of up to 54°N (Hoestland 1948, Edmondson 1959, Nepszy and Leach 1973, Ingle 1986, Jansson 1994, Gollasch *et al.* 1999).
They also spread into France and became moderately abundant in the Gironde Estuary in the 1950s and reached the adjacent Dordogne and Garonne rivers in 1953-58 (Hoestland 1959). Further records were reported from the Languedoc lagoons along the French Mediterranean coast in 1959-68. However, self-sustaining populations were not reported in the Mediterranean (Petit 1960, Petit and Mizoule 1974). Further occurrences in moderate abundance were reported for the Tagus River (PT) in 1988-90 (Cabral and Costa 1999). One mitten crab was collected in the Humber River drainage (GB) in 1949 and occasional crabs records were reported here since 1976 (Clark *et al.* 1998, Ingle 1986). Two crabs were collected near Oslo (NO). However, an establishment of the crab was not reported (Christiansen 1977). Its northernmost records in Europe are from the

Bothnian Bay (65°N; Haahtela 1963). There are some occasional findings from the Finnish Lake District, connected by a canal with the Baltic Sea (Valovirta and Eronen 2000). In Sweden it is found both on the Swedish west coast and in the Baltic along the entire coast from Kattegatt-Skagerrak to the Finnish border in the Bothnian Bay. It is also found in the freshwater lake systems of Vänern and Mälaren (Lundin et. al 2007). The numbers observed in Sweden has increased greatly since the year 2000.
In Norway 6 individuals have been found – 4 males in the river Glomma estuary in 1976, 1986, 1995 and 1997, respectively, and in 2004 one male and one female with eggs in Iddefjorden (Wergeland et al. 2008).
It has not been recorded in Iceland (Poulsen 1939, G.M. Gislason, pers. comm.).
Since 1992 mitten crabs became commonly established in the San Francisco Bay region (Cohen and Carlton 1995, Rudnick *et al.* 2000). A few adult mitten crabs were collected in the Great Lakes from 1965 to 1994 (Nepszy and Leach 1973). A single Chinese mitten crab was collected in the Mississippi River delta in 1987 (Felder, pers. comm. 1995). Recently (September 2004) a mitten crab was found in the St. Lawrence River near Quebec City (Canada) (de Lafontaine 2005). In 2004 two specimens were found in Tokyo Bay (Uchida pers. comm.) – however, this may be due to range expansion from the nearby native region.
Potentially suitable habitats are characterised by cold-temperate to tropical climate regimes with larger estuaries. Highly contaminated waters do not appear to exclude their establishment.

Pathways of introduction
Introducing vectors are shipping (ballast tanks and hull fouling of vessels) and imports of living species for aquaria or human consumption (Marquard 1926, Peters 1933).

Alien status in region
Crab findings are oscillating in numbers. Due to favourable conditions, little competition and an abundant food supply the crabs became abundant in German waters. The first mass development was documented during the 1930s – and was followed by other mass occurrences in 1940s, 1950s, 1980s and 1990s. Crab populations in the Netherlands and the United Kingdom showed similar developments (Clarke, pers. comm.), but in much lower numbers in Dutch waters (Wolff, pers. comm.).

Country	Not found	Not established	Rare	Local	Common	Very common	Not known
Austria		X					
Belgium				X			
Czech republic		X					
Denmark				X			
Estonia			X				
European part of Russia		X					
Finland		X					
Faroe Islands	X						
Germany						X	
Greenland	X						
Iceland	X						
Ireland		X					
Latvia		X					
Lithuania		X					
Netherlands					X		
Norway		X					

Poland	X
Sweden	X

Table 1. The frequency and establishment of *Eriocheir sinensis*, please refer also to the information provided for this species at www.nobanis.org/search.asp. Legend for this table: **Not found** –The species is not found in the country; **Not established** - The species has not formed self-reproducing populations (but is found as a casual or incidental species); **Rare** - Few sites where it is found in the country; **Local** - Locally abundant, many individuals in some areas of the country; **Common** - Many sites in the country; **Very common** - Many sites and many individuals; **Not known** – No information was available.

Occasionally individuals have been found beyond their currently established populations (e.g. in the Danube in Austria; Rabitsch & Schiemer 2006). Such appearances may well precede their subsequent establishment in suitable locations. Frequent observations are made all around the coasts of the Baltic Sea, for example at the island of Bornholm (Tendal 2001) (see also table 1). It seems unlikely that the species is able to attain self-sustaining populations here due to the low water salinity. However, an egg-carrying female was found recently in Lithuanian waters (Olenin, pers. comm.).

Ecology

Habitat description

This migrating species occurs in rivers, estuaries and marine habitats of cold-temperate to tropical climate areas from lower shorelines to about 10 m in depth. This species is tolerant to highly polluted water.

Reproduction and life cycle

The crabs´ life-cycle is characterised by migrations in waters with changing salinities. Larvae develop in marine waters. Young crabs and young adults actively migrate upstream. In their native distribution living crabs have been found many hundred kilometres upstream the river Jangtsekiang. In Europe crabs are found frequently in the eastern Gulf of Finland, being located more than 1500 km from the main area of abundance, the German Bight (Ojaveer *et al.* 2007). Two year old adults migrate downstream to the marine conditions in summer. This movement may take several months during which they become reproductively mature.
Mitten crabs feed on a wide variety of plants, invertebrates, fishes and also detritus.

Dispersal and spread

Range extensions likely occur with drift of larvae or following the active migration of juvenile and adult species via rivers and canals (Arndt 1931, Boettger 1933, Luther 1934, Pienimäki and Leppäkoski 2004).

Impact

Affected habitats and indigenous organisms

This species has been nominated as among 100 of the "World's Worst" invaders.

Eriocheir sinensis tolerates a wide range of abiotic factors and occurs in estuaries, lakes, riparian zones, water courses, wetlands. Especially during mass developments the impact of this invader becomes obvious:

- Habitat
  Burrowing activities of crabs result in damages of dikes, river embankment erosion. Clogging of water intake filters of e.g. industrial cooling water supply and drinking water plants during mass occurrences
- Commercial stocks
  Crabs are preying heavily upon native species, especially during mass occurrences.
- Other biota
  Competition for space and food. The crab also preys upon a large number of native species, including macroalgae, invertebrates and fish.

Genetic effects
Genetic effects, such as hybridisation with native species are unlikely.

Human health effects
Effects on human health in Europe are not reported. However, the crab is the second intermediate host for human lung fluke parasite in Asia. The Oriental lung fluke is a parasite that uses a snail as its primary host, freshwater crayfish and crabs as intermediate hosts, and a variety of mammals (including humans), as a final hosts in its life cycle. Human can become infected with the parasite through ingestion. The fluke settles in the lungs and other parts of the body, and can cause significant bronchial or, in cases where it migrates into the brain and/or muscles, neurological illnesses.

Economic and societal effects
The negative impact of the mitten crab became especially clear during the mass occurrences in German waters. The mass developments lasted for approx. 30 years. Up to 140 t of juvenile crabs were caught annually during mass developments in the last century with a single fishing net collecting up to 50-60 kg of crabs per day (Fladung, pers. comm.).

The monetary impact caused by this invader in German waters alone totals to approx. 80 million Euro since its first occurrence in 1912 (cost calculation adjusted from Fladung, pers. comm.). Cost items include:

- Catchment gear installation and maintenance,
- Impact on bank erosion and feeding, and
- Loss in commercial fisheries and pond-aquaculture (estuaries and in-land).
  Crabs feed on fishes caught in traps and nets. Nets will be damaged.
  In freshwater ponds the crabs feed on the cultured fish and their food.

Additional negative impacts are known, but cannot be quantified in monetary terms, *i.e* impacts on biodiversity, recruitment of commercial species and an increased erosion rate due to crab burrowing activities in river embankments (Gollasch and Rosenthal in prep.).

A positive effect of the crabs is their market value as they were and continue to be sold for 1 to 3 € /kg for industrial use and for direct human consumption (Asian markets). During 1994-2004 crabs in the value of approximately 3,000,000 to 4,500,000 € were sold (Gollasch and Rosenthal in prep.).

Management approaches

Prevention methods
Methods to minimize future spread are quite limited once the species is introduced. Migration barriers and eradication programmes show limited success (see below). Certain guidelines and regulatory instruments may however be applied in areas where the species does not (yet) occur. In particular this refers to ballast water management measures and control options in life species trade. For further details see the Ballast Water Management Convention of the International Maritime Organization (www.imo.org) and the Code of Practice for the Introduction and Transfer of Marine organisms of the International Council for the Exploration of the Sea (www.ices.dk). However, these instruments address biological invasions in general and not specifically the mitten crab.

Eradication, control and monitoring efforts
Control options, such as trapping of crabs, have not been found to be effective to reduce the damage caused to river banks and from crabs feeding on trapped fish or in commercial pond aquaculture. Crabs have been used as bait for eel fishing, to produce fish meal, cosmetic products and for human consumption (Panning and Peters 1932, Peters *et al.* 1936, Leppäkoski 1991).
It seems that eradication programmes are unsuccessful once the crab has established self-sustaining populations. The "catch as many as you can" strategy showed limited success.

Information and awareness
This invader occurs in Europe since almost 100 years and this is why some believe it is a species belonging to our waters. Awareness raising initiatives were (so far) limited to publications in journals available to the public. The general perception is that not much can be done to manage the mitten crab.

Knowledge and research
As the crab is only collected occasionally in Baltic waters no substantial research on the particular invader developed. However, invasion biology in general is a research topic in almost all Baltic countries. Recently a network of researchers who deal with mitten crabs develop in the region and this has resulted in a joint publication on mitten crab findings in the Baltic (Ojaveer *et al.* 2007). The following major research questions were proposed: 1) What is the role of the species in the Baltic ecosystems as a predator, prey, host or some other disturbing agent, in relation to its present abundance?; 2) Given the currently believed 'supply-side' dynamics of the occurrence of the Chinese mitten crab in the Baltic basin, the question is whether an understanding of the population dynamics of the crab in the North Sea, combined with knowledge of regional oceanographic processes, would permit accurate predictions of the population sizes of the crab in the Baltic Sea?; 3) Is *E. sinensis* actually able to reproduce at lower salinities than currently known and documented?; and 4) Are the interactions between water temperature, salinity and physiological key processes (osmoregulation) of *E. sinensis* important for its future invasiveness and success within the invaded communities? Resolving some of these issues may need tagging experiments, detailed physiological studies and molecular genetic approaches (Ojaveer *et al.* 2007).

Recommendations or comments from experts and local communities
The first mass development of mitten crabs in Germany in the 1930s prompted many studies in the North Sea region. However, comprehensive studies in the Baltic are lacking. Despite the best efforts, no effective management approach could be developed and all eradication efforts showed limited efficiency. Recent findings of an egg-carrying female crab may indicate an adjustment for reproduction in lower salinities. It is recommended to assess the crab reproduction in lower

salinities in laboratory tests. Further, the migration pathway into the Baltic Sea may be analysed (Ojaveer *et al.* 2007.).

References and other resources

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Links
Baltic Sea Alien Species Database

Invasive Species Specialist Group – Database on *E. sinensis*

Swedish Museum of Natural History – Fact sheet on *E. sinensis*

Alien Species in Swedish Seas - Fact Sheet on E. sinensis
www.frammandearter.se/0/2english/pdf/Eriocheir_sinensis.pdf

References
Reference material is available in the Universität of Hamburg, Zoological Institute ad Museum, Martin-Luther-King-Platz 3, 20146 Hamburg, Germany.

Anger, K. (1990): Der Lebenszyklus der Chinesischen Wollhandkrabbe (*Eriocheir sinensis*) in Norddeutschland: Gegenwärtiger Stand des Wissens und neue Untersuchungen. Seevögel, 11 (2): 32-37 pp.
Arndt, W. (1931): Die Tierwelt des Nordostseekanals und ihr Lebensraum. Der Naturforscher, 8 (4): 113-118 pp.
Boettger, C. R. (1933): Die Ausbreitung der Wollhandkrabbe in Europa. Sitzungber. Ges. naturforsch. Freunde, Berlin 1933., 399-415 pp.
Cabral, H.N. and Costa, M.J. (1999): On the occurrence of the Chinese Mitten Crab, *Eriocheir sinensis*, in Portugal. Crustaceana 72(1): 55-58
Christiansen, M.E. (1977) The Chinese mitten crab found for the first time in Norway. Fauna (Oslo) 30: 134-138
Clark, P.F.C., Rainbow, P.S., Robbins, R.S., Smith, B., Yeomans, W.E., Thomas, M. and Dobson, G. (1998): The alien Chinese mitten-crab, *Eriocheir sinensis* (Crustacea: Decapoda: Brachyura), in the Thames catchment. Journal of the marine biological Association of the United Kingdom 78: 1215-1221
Cohen, A.N. and Carlton, J.T. (1995): Biological study: Non-Indigenous aquatic species in a United States estuary: a case study of the biological invasions of the San Francisco Bay and Delta. US Fisheries and Wildlife and National Sea Grant College Program Report PB96-166525, Springfield, Virginia, USA, 273 pp
Czerniejewski P., Filipiak J., Radziejewska T. 2003: Body weight and morphometry of the chinese mitten crab (*Eriocheir sinensis* H. Millne-Edwards, 1853) in the River Odra/Oder Estuary (North-Western Poland). Acta Scientarum Polonorum. Ser. Fisheries 2(2): 29-39
de Lafontaine, Y. (2005): First Record of the Chinese Mitten Crab (*Eriocheir sinensis*) in the St. Lawrence River, Canada. J. Great Lakes Res. 31:367–370
Edmondson, C. H. (1959): Hawaiian Grapsidae. Occ. Pap. Bernice P. Bishop Mus. Honolulu, Hawaii, 22 (10): 153-202 pp.
Gollasch, S. and Rosenthal, H. (2006) The Kiel Canal. In: Gollasch, S., Galil, B.S. and Cohen, A. (eds.) Bridging Divides. Maritime Canals as Invasion Corridors. 315 pp.
Gollasch, S., Minchin, D., Rosenthal H., and Voigt, M. (eds.) (1999): Exotics Across the Ocean. Case histories on introduced species: their general biology, distribution, range expansion and impact. Logos Verlag, Berlin. 78 pp. ISBN 3-89722-248-5
Haahtela, I. 1963. Some new observations and remarks on the occurrence of the mitten crab, *Eriocheir sinensis* Milne-Edwards (Crustacea, Decapoda), in Finland. Aquilo, Ser. Zoologica 1: 9-16.
Hoestland, H. (1948): Recherches sur la biologie de l'*Eriocheir sinensis* en France (Crustacé brachyoure). Ann. Inst. Océanogr., Monaco 24(1): 1-116
Hoestland, H. (1959): Répartition actuelle du crabe chinois (*Eriocheir sinensis* H. Milne Edwards) en France. Bull. Franc. Piscicult. 194: 5-14
Ingle (1986): The Chinese Mitten Crab *Eriocheir sinensis* H. Milne-Edwards - a contentious immigrant. The Lond. Naturalist, 65, 101-105 pp.
Jansson, K. (1994): Unwanted Aquatic Organisms In Ballastwater. MEPC, 36, (INF.20), 1-68 pp.
Jensen, A.S. (1936): Den kinesiske uldhåndskrabbe (*Eriocheir sinensis* M.-Edw.) i Danmark. Kgl. Vid. Selsk. Biol. Meddl. ,13:1-23 pp.
Kaestner, A. (1970): III. Crustacea. Invertebrate Zoology. John Wiley and Sons Inc., New York, 523 pp.
Leppäkoski, E. J. (1991): Introduced species - Resource or threat in brackish-water seas? Examples from the Baltic and the Black Sea. Mar. Poll. Bull., 23: 219-223 pp.

Lundin, K., Aneer, G., Berggren, M., Drotz, M., Filipsson, O., Lundberg, S. , von Proschwitz, T., & Svensson, J-E. (2007). Chinese Mitten crab advacning in Sweden. Ullhandskrabba – en art på frammarsch i Sverige. Fauna och Flora 102 (3): 10-19.
Luther, A. (1934): Über die ersten in Finnland gefundenen Exemplare der Wollhandkrabbe (*Eriocheir sinensis* MILNE-EDW.). Memo. Soc. Fauna Flora Fennica, 10: 69-73 pp
Marquard, O. (1926): Die Chinesische Wollhandkrabbe, *Eriocheir sinensis* MILNE-EDWARDS, ein neuer Bewohner deutscher Flüsse. Fischerei, 24: 417-433 pp.
Michaelis, H. and Reise, K. (1994): Langfristige Veränderungen des Zoobenthos im Wattenmeer. In: Lozán, J. L.; Rachor, E.; Reise, K.; Westernhagen, H. v. and Lenz, W. (eds.), Warnsignale aus dem Wattenmeer. Bd. 2, Blackwell Wissenschafts-Verlag, Berlin, 106-116 pp.
Nepszy, S. J. and Leach, J. H. (1973): First Records of the Chinese Mitten Crab, *Eriocheir sinensis*, (Crustacea: Brachyura) from North America. J. Fish. Res. Bd. Canada, 30 (12): 1909-1910 pp.
Ojaveer, H., Gollasch, S., Jaanus, A., Kotta, J., Laine, A., Minde, A., Normant, M. and Panov, V (2007) Chinese mitten crab *Eriocheir sinensis* in the Baltic Sea – a supply-side invader? Biol Invasions 9:409–418
Panning, A. and Peters, N. (1932): Wollhandkrabbe und Elbfischerei. Hamb. Nachr., 6: 1-16 pp.
Panning, A. (1938): The chinese Mitten Crab. Smithsonian Rep., 361-375 pp.
Panning, A. (1952): Die chinesische Wollhandkrabbe. Die neue Brehm-Bücherei, 70: 1-46 pp.
Peters, N. (1933): B. Lebenskundlicher Teil . In: Peters, N. and Panning, A. (eds.), Die chinesische Wollhandkrabbe (*Eriocheir sinensis* H. MILNE-EDWARDS) in Deutschland. Akademische Verlagsgesellschaft mbH, Leipzig, 59-156 pp.
Peters, N.; Panning, A.; Thiel, H.; Werner, H. and Schmalfuß, H. (1936): Die chinesische Wollhandkrabbe in Europa. Der Fischmarkt, 4/5: 1-19 pp.
Petit, G. (1960): Le "Crabe Chinois" est parvenu en Méditerranée. Vie Milieu 11(1): 133-136
Petit, G. and Mizoule, R. (1974): En douze ans le "Crabe chinois" na pu réussir son implantation dans les lagunes du Languedoc. Vie Milieu 23(1c): 181-186
Pienimäki, M. and Leppäkoski, E. (2004): Invasion pressure on the Finnish Lake District: invasion corridors and barriers. Biological Invasions 6: 331-346
Poulsen, E.M. 1939: Freshwater Crustacea. Zoology of Iceland. 3 (35): 1-50.
Rabitsch, W. and Schiemer, F. (2003) Chinesische Wollhandkrabbe (*Eriocheir sinensis*) in der österreichischen Donau festgestellt. Österreichs Fischerei 56: 61-65.
Reise, K. (1991): Ökologische Erforschung des Wattenmeeres. Biologie der Meere. Spektrum Akad. Verl., Heidelberg, 68-79 pp.
Rudnick, D.A., Halat, K.M. and Resh, V.H. (2000): Distribution, ecology and potential impacts of the Chinese mitten crab (*Eriocheir sinensis*) in San Francisco Bay. University of California, Berkeley, Water Resources Center, Contribution 26, 74 pp
Schnakenbeck, W. (1924): Ueber das Auftreten chinesischer Krabben in der Unterelbe. Schr. für Süßwasser- und Meereskunde, 5
Sukopp, H. and Brande, A. (1984): Beiträge zur Landschaftsgeschichte des Gebietes um den Tegeler See. Sitzungsber. Ges. Naturforsch. Freunde Berlin, 24: 198-214/1-7 pp.
Tendal, O. (2001): Den kinesiske uldhåndskrabbes pseudopopulation ved bornholm. Flora og Fauna 107: 6.
Tendal, O.S., 2008: Den kinesiske uldhåndskrabbe I Danmark: en stadig indvandrer. - Flora og Fauna 114: 59-62.
Valovirta, I. and Eronen, R. 2000. First record of Eriocheir sinensis from Finnish inland. Memoranda Soc. Fauna Flora Fennica 76 23-25 (in Finnish, with English summary).
Wergeland Krog, O.M., Bøhmer Olsen, J and Gollasch, S. 2008: "Kinesisk ullhåndkrabbe Eriocheir sinensis (H. Milne Edwards, 1853) påvist i Iddefjorden - status for arten i Norge." i Norsk Zoologisk Forenings tidsskrift Fauna vol. 61, nr. 1-2, pp. 10-15 (in Norwegian)
Zibrowius, H. (1991): Ongoing Modification of the Mediterranean Marine Fauna and Flora by the Establishment of Exotic Species. Bull. Mus. Hist. Nat. Marseille, 51: 83-107 pp.

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