

First record of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853 (Crustacea: Brachyura: Varunidae) from Lake Ladoga, Russia

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Abstract

A special survey has been conducted to record the distribution of Chinese mitten crab, *Eriocheir sinensis* in the eastern Gulf of Finland basin (Baltic Sea). An illustrated questionnaire/registration form was distributed among the commercial fishermen. The survey indicated a significant increase in the abundance of adult crabs in 2003 migrating downstream in the Neva River, the connecting channel between the Gulf of Finland and Lake Ladoga. On October 25, 2005, the Chinese mitten crab was reported from Taypolovsky Bay, Lake Ladoga and this is the first confirmed record from Europe's largest lake.

Key words: invasive crustaceans, *Eriocheir sinensis*, first record, Lake Ladoga, Baltic Sea

Introduction

The Chinese mitten crab *Eriocheir sinensis* H. Milne-Edwards 1853 (for date of authority and taxonomy see Clark 2006) was first recorded from the Aller River, Germany, Europe in 1912, probably as a result of an accidental introduction from ships' ballast water. In 1926 this invasive species was found on the German coast of the Baltic Sea, as a possible consequence of active migration via the Kiel Canal (Gollasch 1999). The Chinese mitten crab is considered to be unable to reproduce in freshwater and in the Baltic Sea. However it was frequently found in high numbers from some rivers and estuaries along the southern Baltic coast (Normant et al. 2000, 2002), and the eastern Gulf of Finland, i.e. the Neva River, the largest tributary to the Baltic Sea, since 1980 (Panov et al. 2003).

Eriocheir sinensis was first recorded from the freshwater ecosystems of the Lake Ladoga basin in the late 1990s from the Vuoksa River (Panov et al. 2003). The specimen may have migrated either from the Lake Saimaa District or from Lake Ladoga. Lake Saimaa is connected with the eastern Gulf of Finland by the Saimaa Canal, and since 1999 records of *E. sinensis* from this area were reported by Pienimäki and Leppäkoski (2004). Lake Ladoga, the largest European lake,

is connected with the eastern Gulf of Finland via the Neva River and Neva Bay (easternmost part of the Gulf of Finland) (Figure 1), but to date there have been no confirmed records of *E. sinensis* from Lake itself.

Methods

Since 2002, when there were numerous records of *E. sinensis* caught in fishing nets in the Russian coastal waters of the eastern Gulf of Finland, a special survey has been conducted in this region using an illustrated questionnaire/registration form, which was distributed among the commercial fishermen. The registration forms included photos of male and female crabs and scheme of measurements of crabs in order to make it user-friendly for fishermen (Annex 1).

Results and discussion

The survey indicated a significant increase in the abundance of *E. sinensis* adult crabs in 2003 migrating, most likely, downstream in the Neva River and the Neva Bay. Geo-referenced records of *E. sinensis* in the eastern Gulf of Finland basin in 2002-2005 are present in the Annex 2.

On October 25, 2005, the first Chinese mitten crab was reported from Lake Ladoga. The adult male was captured in fishing nets, Taypolovsky



Figure 1. Location of Chinese mitten crab records in the eastern Gulf of Finland area. Asterisk indicate location of the first confirmed record in Lake Ladoga. Dashed line indicated the Saimaa Canal.

Bay (Figure 1), 60°37.9' N, 30°32.2' E. The crab measured: carapace width 57 mm, carapace length 53 mm, and body weight 81 g (Figure 2).

Most likely, this migrating individual entered Lake Ladoga from the Burnaya River, a lower part of the Vuoksa River, and was trapped in the gillnet while moving towards the Neva River and eastern Gulf of Finland as part of regular seasonal migration of adult crabs to the western Baltic or North Sea for reproduction. In 1997 one individual of *E. sinensis* was found in the lower Burnaya River, close to the location of the first record of this species in the Lake Ladoga (Figure 1).



Figure 2. Adult male of *Eriocheir sinensis* caught in Lake Ladoga on 25 October 2005 (Zoological Institute RAS Collection Number 5/88481).

Eriocheir sinensis is the second crustacean invader recorded in Lake Ladoga, the first being the *Gmelinoides fasciatus* Stebbing. During the last two decades this Baikalian amphipod has successfully become established in littoral communities of the lake (Panov 1996). Consequences of recent mass invasion of Chinese mitten crab in freshwater ecosystems in the Lake Ladoga basin is not clear and require further study.

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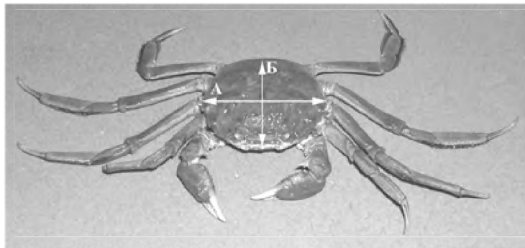
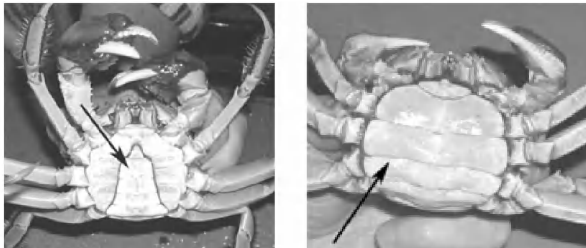
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Annex 1

Chinese mitten crab record form

	
<p><i>Figure 1. How to measure crabs</i> A – carapax width B – carapax length</p>	<p><i>Figure 2. How to distinguish sexes in crabs</i> A – male B – female</p>

Date of record:

Record location with geographic coordinates:

Device of capture (gillnet, other):

Table with individual crab parameters:

N	Sex	Presence of eggs in female	Width, mm (see Figure1)	Length, mm (see Figure1)
1.				
2.				
3.				
4.				
5.				

Name of recorder:

Date of filling the form:

Annex 2Records of *Eriocheir sinensis* in the eastern Gulf of Finland basin in 2002-2005*

Location	Geographic coordinates		Record date	Species abundance	Collector
	Latitude, °N	Longitude, °E			
Krasnenkaya River	59.8556	30.1583	01.10.2002	2.00	V.E. Panov
eastern Gulf of Finland	59.9000	30.1833	10.09.2002	1.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	60.0444	29.9000	10.10.2002	1.00	V.E. Panov
eastern Gulf of Finland	60.1833	29.6333	11.10.2002	1.00	V.E. Panov
eastern Gulf of Finland	60.1833	29.7333	11.10.2002	1.00	V.E. Panov
eastern Gulf of Finland	59.9833	29.3667	20.02.2003	1.00	V.E. Panov
eastern Gulf of Finland	59.9500	29.6333	22.02.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.0167	29.3333	21.03.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.0000	29.3000	23.03.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.0167	29.3333	24.03.2003	1.00	V.E. Panov
eastern Gulf of Finland	59.9833	29.6500	07.05.2003	1.00	V.E. Panov
eastern Gulf of Finland	59.9667	29.6500	09.05.2003	2.00	V.E. Panov
eastern Gulf of Finland	60.0167	29.4000	11.05.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.0000	29.4167	12.05.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.0000	29.1500	20.05.2003	2.00	V.E. Panov
eastern Gulf of Finland	59.9833	29.6667	21.05.2003	3.00	V.E. Panov
eastern Gulf of Finland, Vyborg Bay	60.7167	28.7333	01.09.2003	1.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9014	30.1442	10.09.2003	1.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9072	30.1778	10.09.2003	1.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9333	30.1500	13.09.2003	4.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	60.1500	29.1667	12.10.2003	1.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9544	30.1972	15.10.2003	9.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9472	30.1686	17.10.2003	13.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9378	30.1939	20.10.2003	5.00	V.E. Panov
eastern Gulf of Finland, Neva Bay	59.9206	30.1581	23.10.2003	14.00	V.E. Panov
eastern Gulf of Finland	60.1583	29.1667	07.10.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.1542	29.1667	23.10.2003	1.00	V.E. Panov
Vuoksa River	60.7833	29.2833	09.11.2003	1.00	V.E. Panov
eastern Gulf of Finland	60.2500	28.9333	15.04.2004	1.00	V.E. Panov
eastern Gulf of Finland	60.1542	29.1667	24.04.2004	2.00	V.E. Panov
eastern Gulf of Finland	60.1542	29.1667	02.05.2004	1.00	V.E. Panov
eastern Gulf of Finland	60.1583	29.4167	07.05.2004	1.00	V.E. Panov
eastern Gulf of Finland, Vyborg Bay	60.7167	28.7167	27.10.2005	1.00	V.E. Panov
Lake Ladoga	60.6333	30.5333	25.10.2005	1.00	V.E. Panov

* Full reference to the data: Panov V.E. (2006) First record of the Chinese mitten crab, *Eriocheir sinensis* H. Milne Edwards, 1853 (Crustacea: Brachyura: Varunidae) from Lake Ladoga, Russia. Aquatic Invasions 1: 28-31