Biogeography **12.**
9–11. Aug. 20, 2010

Later Appearance of Giant Jellyfish, *Nemopilema nomurai* (Scyphozoa: Rhizostomeae), in the Inshore Waters at the Jindo Island and the Jeju Island, Korea in November, 2009

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Abstract. Distributions of *Nemopilema nomurai* (Scyphozoa: Rhizostomeae) were surveyed by sightseeing on board, watching at small fishing ports, stranding observation on beaches and hearing fishermen's information around the Jindo Island and the Jeju Island of Korea during 13th – 18th November, 2009. The appearance data including the large medusa were obtained at the two islands in spite of the near-end period of the occurrence.

Key words: giant jellyfish, *Nemopilema nomurai*, occurrence, Korean coasts, Jindo Island, Jeju Island.

Introduction

Nemopilema nomurai Kishinouye, 1922 is one of the giant jellyfish belonging to class Scyphozoa of phylum Cnidaria (Omori & Kitamura, 2004). The mass-occurrences in the coastal waters of Japan and Korea have unexpectedly brought serious damages to the coastal fisheries in the first decade of the 21st century (Fisheries Research Agency, 2010). This jellyfish also appears in the Chinese and Korean waters, where it seems to be liberated from the polyp in the spring exclusively. We observed the appearances of the giant jellyfish in the warm waters of the south-west Korea near the end-period of the occurrence, so we report the data briefly.

Materials and Methods

The appearance data were collected by sightseeing on board, watching at small fishing ports, stranding observation on beaches and hearing fishermen's information around the Jindo Island and the Jeju Island of Korea during 13th – 18th November, 2009.

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Results

We report the appearance data only.

1) Jindo Island

According to the fishermen of Seomang Port (Fig. 1–1), many jellies were observed in the offshore waters on 14th November, 2009. Actually, one jelly was caught by a small set-net, but it was much injured. The fragments were also stranded on the Geumgap beach (Fig. 1–2).

2) Jeju Island

Just before (*ca.* 30 minutes) the arrival of ferry boat at the Jeju harbor (Fig. 1–3), nine jellies were observed on the board on 15th November, 2009. Six jellies were found out of the harbor and three were in the harbor. The bell diameter ranged from 50 cm

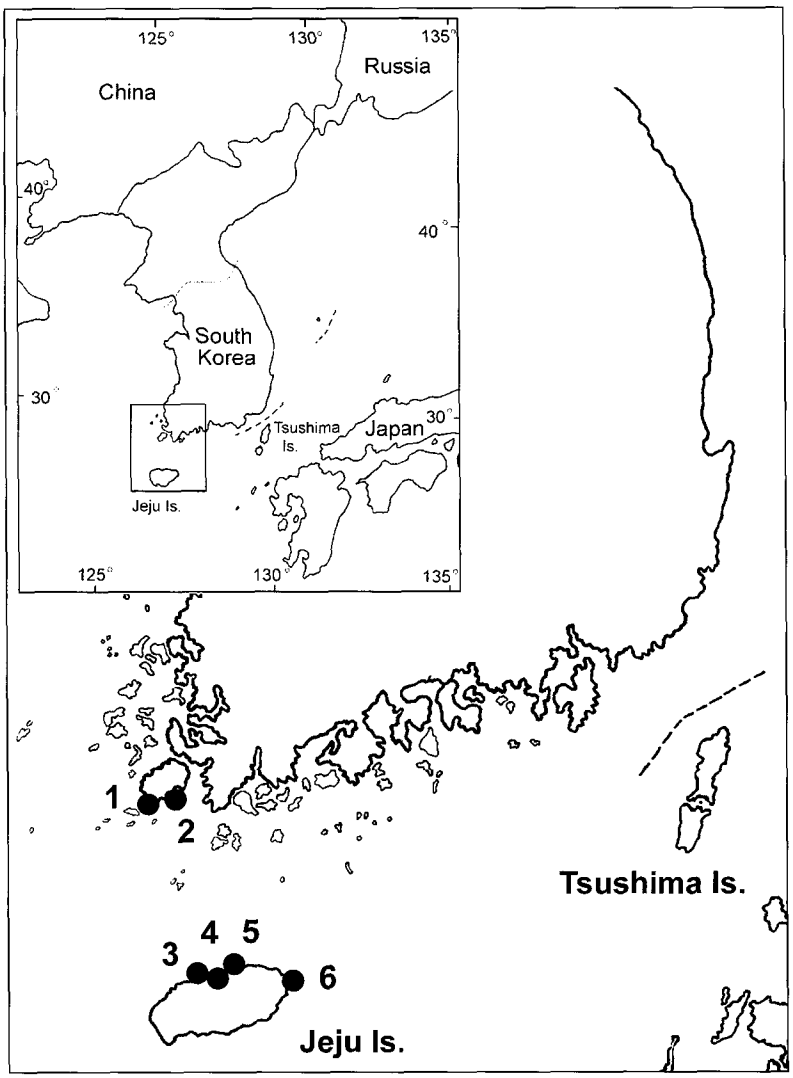

Fig. 1. Six points at around the Jindo Island and the Jeju Island of Korea, where *Nemopilema nomurai* were observed.

to 100 cm. In the next day, some fragments were observed in Jocheon port (Fig. 1-4). Many fragments also were stranded on the Hamdeok beach (Fig. 1-5) on 16th and 18th November. One swimming jelly (*ca.* 60 cm in diameter) and two fragments were observed at the surface water of Seongsan port (Fig. 1-6) on 18th November. This living jelly could swim so actively against waves that it could not be collected.

Discussion

The unusual stranding of *Nemopilema nomurai* was first recorded at Tsushima Island of Japan in the last century (Kubota *et al.*, 1996). The present occurrences of *N. nomurai* in the south-west coastal waters (Jindo Is. and Jeju Is.) of Korea on the middle November of 2009 could be regarded to be the final observation in a year, considering the life cycle (Kawahara *et al.*, 2006). Thus, the *nomurai* jellies, observed or collected

in this study, could be considered to be one of the old medusae that remained in the presumptive occurrence area and its adjacent waters in the Korean seacoasts for the present species. Such specimens have never been reported in such an area. They also seemed to be the matured individuals, while the gonads were not surveyed, because Ueno *et al.* (in preparation) observed the maturation of this medusa in the coastal waters of Tsushima Island, Nagasaki Prefecture Japan, on 6th November, 2009. In future, it is much expected to study the appearance of the ephyra and metephyra in this surveyed area.

It is not easy to correlate the late occurrence (actually in November) of mature medusae with environmental changes such as increase in seawater temperature, etc., although the correlation is supposable. Further biological studies are needed to elucidate such appearance of this species.

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(Accepted May 31, 2010)