



## JAMBIO Coastal Organism Joint Surveys reveals undiscovered biodiversity around Sagami Bay



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### HIGHLIGHTS

- JAMBIO Coastal Organism Joint Surveys were held in and around Sagami Bay.
- About 50 probable undescribed species have been collected so far.
- The surveys are useful for ecological, phylogeographical, and environmental studies.
- More JAMBIO Coastal Organism Joint Surveys are planned in the future.
- JAMBIO aims to form a collaborative network between marine biologists.

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### ABSTRACT

JAMBIO, Japanese Association for Marine Biology, has been organizing JAMBIO Coastal Organism Joint Surveys at Shimoda Marine Research Center, University of Tsukuba, and Misaki Marine Biological Station, the University of Tokyo. The aims of the Surveys are to uncover the benthic marine fauna of the coastal areas in and around Sagami Bay, and to form a collaborative network between marine biologists across Japan. We have so far performed six surveys, with over 100 participants in total, using common equipment such as dredges, bottom mud samplers, and epibenthic sleds. Even in Sagami Bay, one of the most

**Abbreviations:** JAMBIO, Japanese Association for Marine Biology; SMRC, Shimoda Marine Research Center, University of Tsukuba; MMBS, Misaki Marine Biological Station, the University of Tokyo; CMB, Center for Marine Biology, the University of Tokyo; WAMS, World Association of Marine Stations; JAMSTEC, Japan Agency for Marine-Earth Science and Technology.

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intensively studied marine environments in the world, we have succeeded in collecting about 50 probable undescribed species. Other species were collected for the first time from Sagami Bay or found from previously unreported depth. The Surveys could be useful for ecological and environmental studies as well. We plan to continue the JAMBIO Coastal Organism Joint Surveys to further reveal the rich biodiversity within and around Sagami Bay and to accelerate nationwide research collaborations. We also hope to expand the Surveys to include plants and protists, and to perform them at other areas in Japan. Through the Surveys, we aim to develop new cross-disciplinary research areas and to record the long-term transition of biota along the Japanese coast.

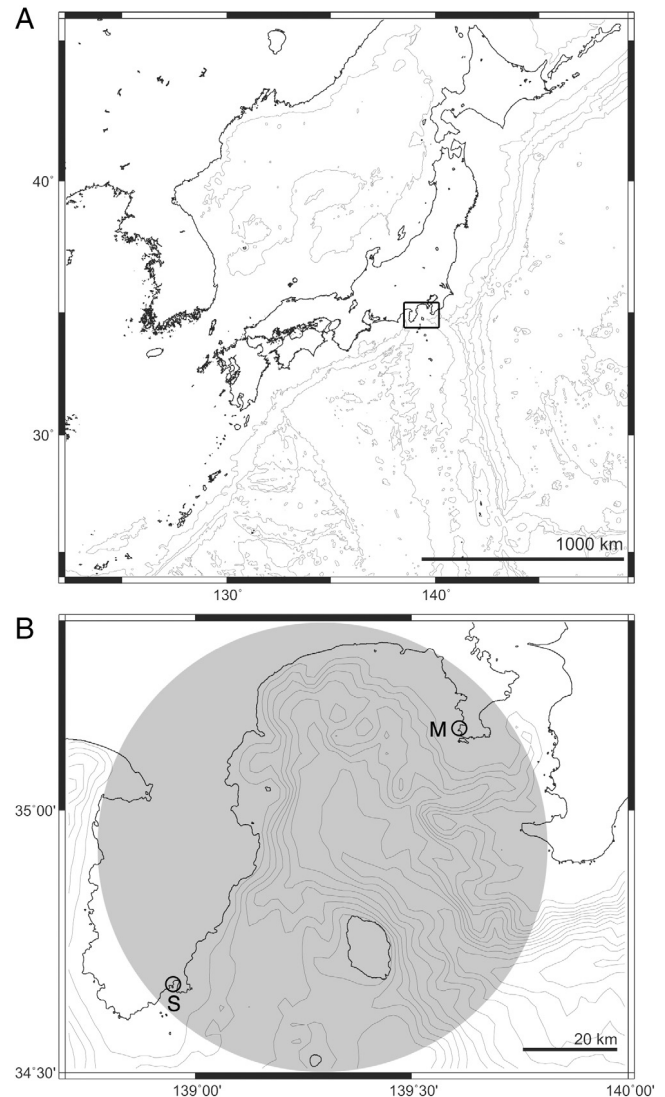
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## 1. Introduction

JAMBIO, Japanese Association for Marine Biology, was established in 2009 to further accelerate nationwide interdisciplinary research collaborations among various marine biology researcher communities in Japan (JAMBIO, 2015). It is approved as one of the Joint Usage/Research Center by the Ministry of Education, Culture, Sports, Science and Technology, and aims to develop advanced, cross-disciplinary, next generation pioneering research areas in the field of marine biology. JAMBIO also acts as a center for international cooperation, and represents Japan at the World Association of Marine Stations (WAMS) (WAMS, 2015). The objective of WAMS is “to become the keystone in a global network of marine stations, uniting the existing marine stations and their regional networks, and create opportunities for expanded collaborations all over the world”.

The two core centers for JAMBIO are Shimoda Marine Research Center (SMRC), University of Tsukuba, and Center for Marine Biology (CMB), the University of Tokyo (Fig. 1). Most researchers of CMB are stationed at the Misaki Marine Biological Station (MMBS), the University of Tokyo (Fig. 1). MMBS was established in 1886 as one of the oldest marine stations in the world, and the oldest in Japan. Situated near the tip of the Miura Peninsula, research at the station has greatly contributed to revealing the rich marine fauna of Sagami Bay. Discoveries of the goblin shark *Mitsukurina owstoni*, Japanese pancake devilfish *Opisthoteuthis depressa*, and many new species of glass sponges, as well as the first collection of a living Beyrich's slit shell *Mikadotrochus beyrichi* have astonished zoologists worldwide (Isono, 1988). Taxonomical research has been continued at MMBS, and its staff has reported a new species of starfish in recent years (Kogure and Kohtsuka, 2014). SMRC is situated in Shimoda city near the tip of the Izu peninsula. Historically, as Shimoda was one of the two ports opened to United States trade in 1854 ending Japan's 200 years policy of seclusion, westerners visited Shimoda and took back biological samples from the area in the late 19th century. Therefore, Shimoda is the type locality for many species of major importance to fisheries such as *Undaria pinnatifida* and *Sargassum fusiforme* (Harvey, 1860). Taxonomical research has been popular at SMRC, with new species of colonial ascidians, amphipods, and hemichordate acorn worms being reported recently (Okuyama and Saito, 2001, 2002; Saito and Nagasawa, 2003; Saito and Okuyama, 2003; Miyamoto and Saito, 2007; Atsumi and Saito, 2011; Aoki and Ito, 2012).

Research at MMBS and SMRC, as well as surveys organized by other institutions in the area (e.g., National Science Museum The National Museum of Nature and Science, 2007, National Science Museum 2006a–c, and Namikawa, 2008 and Japan Agency for Marine-Earth Science and Technology (JAMSTEC) Lindsay et al., 1998, and Fujikura et al., 2010) have made Sagami Bay one of the most intensively studied marine environments in the world. However, most taxonomical research and survey in and around Sagami Bay have mainly concentrated on the deep sea of over



**Fig. 1.** Research area of the JAMBIO Coastal Organism Joint Surveys. A: Map of Japan, with the area enlarged in B shown with a square. Bathymetric contour interval is 2,000 m. B: Area around Sagami Bay indicated with a gray circle. S: SMRC; M: MMBS. Bathymetric contour interval is 200 m. Both maps generated using GMT5 (Wessel et al., 2013) and Adobe Illustrator CS6 based on data publicly available from ETOPO<sub>1</sub> (Amante and Eakins, 2009).

several hundred meters in depth. Furthermore, most research have focused on animals several centimeters or larger, while smaller animals have been mostly ignored. There are also many species that have been reported once, or have not been found recently. To uncover the marine fauna of the coastal areas in and around Sagami Bay, and to search for undescribed and long-forgotten

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