

Development and commercialization of harmful red tide detection kit

- We developed a detection method for two kinds of harmful red tide algae using Loop-mediated Isothermal Amplification (LAMP) method and commercialized as harmful red tide detection kits.
- The method is useful for red tide monitoring and expected to contribute for mitigation of fishery damages caused by red tides.

Red tides often cause tremendous damage to the fishery industry. In order to prevent the damage, it is necessary to monitor the occurrence and distribution of harmful algae causing red tide constantly, grasp the emergence situation at early stage, and take measures such as moving fish cages and stopping feeding. In the ordinary red tide monitoring, identification of causative species is carried out by observation under a microscope and the cell density is counted to determine the state of occurrence. These steps, however, require advanced knowledge in species identification, in addition to the considerable time needed in counting the cell density. Therefore, it was required to develop a new method for detecting and identifying harmful algae easily, quickly, and accurately.

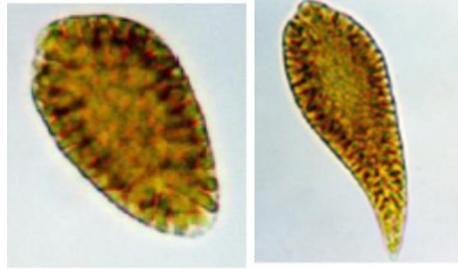
The Japan Fisheries Research and Education Agency (FRA) and Nippon Gene Co., Ltd. worked on joint development research in order to put practical application of a high sensitive method detecting harmful red tide algae using LAMP method which had been already established by FRA. Our collaborative works resulted in the standardization of the detection procedures as well as the creation of two kinds of kits that includes the necessary reagents for the easy, quick, and accurate detection of the harmful algae, *Karenia mikimotoi* and *Chattonella* spp. Using the kits enable the detection from 1 cell of the harmful algae in 10 mL of sea water without the need for advanced knowledge in the species identification.

Using these kits to sensitively detect the harmful algae at the very early stage of the occurrence enables implementing appropriate countermeasures against the red tide early on; therefore, that is expected to contribute the mitigation of damage to the fishery industry caused by the red tides.

\* A part of these results was obtained in a project for the addressing red tides and oxygen-depleted water masses supported by the budget from the Fisheries Agency of Japan.



*Karenia mikimotoi*



*Chattonella marina* (left) and *Chattonella antiqua* (right)