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Development of Low-Cost Simple Detection Method and Study on the Safety of Halophilic Microorganisms in Solar Salt and Rock Salt

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Summary

In Japan, the liberalization of salt sales has made it possible to easily obtain various types of solar salt and rock salt regardless of whether in Japan or abroad. In 2019, the kind of salt that circulates in Japan has been more than 1,500. Nowadays, various kinds of salt are used differently depending on the cooking and its use, and often the salt itself is used directly. About microorganism in food, there are national standards such as ingredient standard and hygiene standard. It does not correspond to all food and harmful microorganisms, and it is not possible to determine the presence or absence of haloarchaea in general food and microorganism tests. In 2015, A group at Kagoshima-Kyoto University reported that "high halophilic bacteria" were infected in the brain of patients with dementia symptoms such as forgetfulness and depression, and encephalomyelitis had occurred. Therefore, detection of halophilic microorganisms in salt is also important from the viewpoint of food safety.

In the previous grant research, we revealed that there are a wide variety of haloarchaea in commercial salts, regardless of the place of production or manufacturing method. Then, they were observed, mostly on JCM No. 298, 457 and 574 medium. These media have pyruvate as carbon source. Additionally, these meida have included sodium chloride, magnesium sulfate, potassium chloride, ammonium salt and phosphate as a common component. Generally, The culture medium used to cultivate halophilic archaea is often expensive. In this study, we developed a variety of halophilic archaea that can grow at low cost.

As a result of investigation of the reagent price, the reason why the culture medium of halophilic archaea becomes expensive is Bacto Agar and NaCl. The water holding capacity and hardness of the medium were maintained by the addition of AgarMate. The price of salt could be reduced by changing the manufacturer company. The new medium was able to identify colonies from 426 samples out of 810 commercially available salt samples. In addition, the price was ¥ 406 lower than that of the JCM No.298 medium, which is the comparison control.