

## 学 位 論 文 要 旨

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題 目	Study of development of technology on quality improvement of fish and processed marine product in Kagoshima (鹿児島県産魚類及び水産加工品の品質向上に関する技術開発研究)

Activation of fishery industry in Kagoshima prefecture has been ranked as an extremely important issue. I have investigated the following important technical subjects on fishery food processing and distribution.

1)[Recovery from stress and changes in body composition of spotted mackerel by briefly testing in a fish cage ] Spotted mackerel caught in purse seines in Kagoshima are commonly rested for a few days in fish cages. They are then killed instantaneously and distributed in Kagoshima as high-quality sashimi (raw fish meat). To elucidate the effects of resting in a fish cage on the flesh quality of spotted mackerel caught by a purse seine, the muscle, blood and liver metabolites after exhaustive exercise by hauling with net were monitored. The concentrations of plasma cortisol in blood and lactate in muscle were increased by the exercise, and then decreased. The glycogen content in liver also recovered during resting. Then, I determined the acceptable period of time for which the fish could be rested unfed in fish cages while still maintaining their high quality as sashimi. To do this, I analyzed the condition factor, various body components such as plasma and muscle properties. Research data indicate that spotted mackerel can be rested unfed in fish cages for less than 15 days before their quality as sashimi products declines. 2) [Postmortem autodigestion of juvenile sardines during cold storage] Postmortem autodigestion of juvenile sardines during cold storage is an obstacle to distribute juvenile sardines for consumption as raw fish. I investigated the changes in total protease activity and types of primary proteases in the whole body of juvenile sardines during cold storage and the effect of physical attrition and compression on the body during fishing on its autodigestion. The juvenile sardines pressed with plates by hand as a pressed fish model showed faster autodigestion. The total protease activity of body of juvenile sardines increased remarkably corresponding to the temperature during cold storage. Results of the protease inhibitory spectrum suggested that the activation of total proteases activity was caused by the autodigestion of precursors of trypsin and chymotrypsin. 3)[Suppression effect of essential oil from pomelo *Citrus grandis* on histamine accumulation in dried whole red-eye round herring(RRH), *Etrumeus teres*] Accumulated histamine in dried whole sardines causes an allergic symptoms of food poisoning. I investigated the processing method to depress histamine accumulation in it. A histamine-producing bacterium was isolated from dried whole RRH. The closest phylogenetic neighbor of this bacterial strain was *Photobacterium angustum*, which shares a 99.15% similarity based on 16S rRNA gene sequencing. An essential oil prepared from pomelo rind showed strong inhibition of growth of *P. angustum* isolated from dried whole RRH. Histamine accumulation was also strongly depressed in dried whole RRH by the addition of the essential oil to the brine used in the salting process. Application of this citrus essential oil therefore effectively suppresses histamine formation in whole dried sardines.

I expect that these research results contribute greatly to develop the fishery industry in Kagoshima