Short Paper

Spectroscopic Observation on the Orange Discolored Meat of Canned Tuna Fish

Recently tuna canneries in Japan are often troubled with orange discoloration of the pre-cooked meat of skipjack, *Katsuwonus pelamis*.¹⁾ The technicians at the canneries are of common opinion that the discoloration has become obvious since the brine freezer came into wide use in skipjack fishing boats. The same discoloration is observed on the canned long-fin tuna, *Thunnus alalunga*, at the Pacific coast canneries in America.

As the fish which develops the orange color on cooking can not be visually distinguished from normal one in raw state, the discoloration phenomena are quite resembled those of the "green" tuna, however, are visually different in color of meat and yellow brown coloration of inner liquid.

Spectroscopic features were compared both on the typical discolored and normal colored meat of the canned skipjack which were prepared at the same factory using those brine frozen fish of the same school. Absorption spectra were determined²⁾ on the meat which had been ground down with small quantity of water a) directly, b) after reduction with hydrosulfite, and c) after addition of nicotinamide and hydrosulfite. As seen in Fig. 1, in the case of normal colored meat a distinct, though small, absorption maximum was observed in the Soret region, and was increased in absorbancy by the addition of hydrosulfite. When nicotinamide and hydrosulfite were added at a time, the sample developed strong pink color and showed two distinct maxima characteristic of hemochrome at around 555 and 525 nm. In the case of orange

discolored meat, no maximum was noted in the Soret region, though a small maximum was revealed by reduction with hydrosulfite. On addition of nicotinamide and hydrosulfite the discolored meat tinged with pink, however the developed tinge was far less than that of normal one. The phenomena reflect to two weak maxima at around 555 and 525 nm in the spectrum. The same phenomena have also been observed on orange discolored tuna meat.

These results suggest that heme compounds in the discolored meat almost lost their reactivity with nicotinamide to form hemochrome and that not a less modification occurred in the heme moiety of the heme compounds in the discolored meat.

It should be left to future studies that if or not the modification of heme moiety directly related to the formation of the pigment responsible for the undesirable orange color though, as the modification seems to be an important clue for the further studies, spectroscopic examination is now in progress on a lot of orange discolored samples.

Junsaku NONAKA and Chiaki KOIZUMI*
Tokyo Univ. Fish., Konan-4, Minato-ku,
Tokyo

References

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カツオ・マグロ缶詰のオレンジ・ミートに関する一知見

* 野中順三九・小泉千秋：東京水産大学

Fig. 1. Absorption spectra of orange discolored and normal colored canned skipjack meat. A: normal meat, B: discolored meat. a): homogenized meat, b): reduction of a) with hydrosulfite, c): addition of nicotinamide and hydrosulfite to a).