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Regulation of Color Development of Squid Skin Melanophore by Changing Ion Composition of Artificial Sea Water

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Summary

Skin color is the most sensitive index to know the freshness of squid. Skin color of squid gradually increases and decreases during its storage in air. In the present study, attempts were made to keep the chromatophores of squid skin active after death by soaking in artificial sea water. Especially mineral essential for keeping the activity was studied. Chromatophores of dead squid still responded to L-Glu, and GABA in the artificial sea water. The former developed the color and the latter suppressed the color development. Suppressed color development by GABA was reversibly recovered upon addition of L-Glu. Such reversible response to L-Glu and GABA was kept unchanged for several days. When stored in sea water, color development level was kept unchanged for up to 5 days. Exposure of the samples stored to air induced color development as observed with fresh squid. Thus, soaking in the sea water was the excellent method to keep the activity of chromatophores after death. Important minerals for keeping chromatophores active were studied by elimination test. Removal of Mg did not change the profile. Removal of K slightly affected the profile. However, removal of Ca significantly reduced color level disappeared in 1 day storage. To understand the importance of Ca in controlling color development, studies were performed by varying Ca concentrations in the artificial sea water. A complete removal of Ca by adding EGTA, Ca specific chelator, enhanced the reduction of color index. Ca higher than 1 mM was required to keep the color level. Reduced color index by treated with EGTA was reversibly recovered by soaking in the solution containing 10 mM Ca.