

Behavior of coral observed by Fluorescence Monitoring System camera and application to deep sea biological research

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The purpose of this presentation is to describe the intensity of fluorescence images that we got using a coral Fluorescence Monitoring System camera and its relationship with environmental fluctuations, and feeding damage from a snail. Moreover, we describe applications to deep sea biological research of the fluorescence photographing technique. Then, in this Japan Geoscience Union Meeting 2012 (Coral Reefs: Life, the Earth and Human Beings), we present a paper about the following results.

Development of coral Fluorescence Monitoring System camera. (FMS_Camera)

Relationship between light intensity of coral fluorescence image and environmental fluctuations.

Apparatus-photographed influence of feeding damage by a snail (*Drupella* spp.).

Application to deep sea biological research of photographing technique.

We developed a time-lapse camera that makes fluorescence photographing of coral possible using a Blue Block filter and fluorescence excitation filter. In-situ observations with the FMS Camera were accomplished in Sekisei lagoon three times. By *in-situ* experimentation, we succeeded in taking time series photographs of coral fluorescence. Regardless of night or day, we were able to produce fluorescence and normal images hourly for 26 days (620 images). The numerical information provided from an image must be correlated with environmental data. We consider the strength and weakness of light intensity to be an indicator of a coral's health. Consequently, we will first extract the light intensity from a part of the fluorescence image. Then we will compare the value with environmental data (for example, water temperature and current velocity).

Recently, we used the filter set from this apparatus and carried out photography of deep sea organisms in the laboratory. Fluorescence photographing was possible with many organisms. Consequently we considered that this photographing technique could be applied to investigation of deep sea organisms.

Yasuo Furushima would like to thank Japan Society for the Promotion of Science (JSPS), Grant-in-Aid for Scientific Research (C), No.21580238, for their partial support for this research.

Keywords: coral Fluorescence Monitoring System camera, coral fluorescence image, intensity of fluorescent image, feeding damage, deep sea organisms