High-Quality Lighting for Corals

○Kazuo Oda[1], Kiyotaka Yokoi[1]
1.KYOCERA Corporation

Zooxanthellae are dinoflagellates that live in symbiosis with corals. When photosynthesizing, zooxanthellae provide corals with essential nutrients for coral growth. Normal coral growth depends heavily on the health of their symbiotic zooxanthellae. To test the effect of light on coral growth, zooxanthellae abundance and photosynthetic pigments (chlorophyll a and peridinin) were studied in corals maintained at 24 ºC and illuminated with Kyocera's Natural White's LEDs (KNW) and a conventional LED (CLED) at 400 µm/cm^2/sec. Trials were conducted for two months, for each lighting regime, using two coral species, *Montipora digitata* and *Acropora* spp., obtained from Okinawa. Corals incubated under KNW retained their original color, while corals incubated under CLED became pale over the two-month trial. Zooxanthellae density, chlorophyll a, and peridinin increased by 32 - 47%, 17 - 44 %, and 26 - 125%, respectively, when incubated using KNW, as compared to CLED. Results indicate that the similarity of KNW to natural sunlight provide a highly suitable environment for the long-term growth of corals. It is anticipated that KNW will provide a great tool to study and better understand coral physiological responses, as well as mechanisms of coral bleaching.