

# Effect of the Green Fluorescent Pigment on the Productivity of the Reef Corals

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## Abstract

Already in the last century, several scholars noted the green coloration of reef corals. But the fluorescent properties of the green pigment were first observed about thirty years ago at Palau. The pigment seems to be functional as a filter for strong irradiations under transparent tropical sea water.

The green fluorescent pigment is found only in the ectodermal cells. It is most brilliant when the coral polyps are fully expanded and when they are exposed to bright sunshine. Under an electron microscope the pigment appears as various distributions of dense spherical bodies of  $0.2 \mu$  or less in diameter. It is easily dissolved in distilled water.

The pigment solution is green in reflected light but pink in transmitted light. Its absorption spectrum shows a strong absorption in the ultraviolet region with a sharp maximum at  $330 \text{ m}\mu$ . Fluorescence spectroscopy indicates that the pigment emits green light (ranging  $450\text{--}510 \text{ m}\mu$ ) when it is activated by light of  $380 \text{ m}\mu$ . The same phenomenon is observed also in the intact green coral.

This fact suggests that the harmful ultraviolet light is converted into light useful for the photosynthesis of zooxanthellae in the endoderm.