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UNIVERSITÀ DI BOLOGNA

DEPARTMENT

EXPERIMENTAL EVOLUTIONARY BIOLOGY - BES

DEPARTMENT OF EVOLUTIONARY AND EXPERIMENTAL BIOLOGY

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present

# ***THE LIGHT FROM THE DARKNESS***

**Responses of zooxanthellate corals to the underwater light field**

Zvy **DUBINSKY**

The Mina and Everard Goodman Faculty of Life Sciences



Bar-Ilan University, Israel

The problems faced by reef building, zooxanthellate corals by the over two orders of magnitude in the underwater light field over their bathymetric range will be discussed on the molecular, biochemical, biophysical metabolic, behavioral and architectural levels. We shall how the high energy striking shallow water reef tables is used, while avoiding its destructive photodynamic potential, and elucidate the means available to dim light, deep water coral colonies to survive on that meager resource.

The following points will be covered:

1. Corals successfully photoacclimate to irradiance levels spanning two orders of magnitude.
2. Photoacclimation involves changes in the light harvesting and utilization of the symbionts.
3. Both host and symbionts mobilize free radical quenching mechanisms and compounds to mitigate high light damage.
4. Colony architecture changes maximizing light available for symbiont photosynthesis under dim light, while increasing tissue area under high light, thereby "diluting" the light reaching the zooxanthellae to optimal levels.
5. High-light growing corals have to rely on prey capture to obtain nutrients, whereas low light colonies have to predate on zooplankton as a source of energy to supplement that translocated from the algae.
6. The susceptibility of corals to Host Factor enhancement of translocation is high in high-light, nutrient-limited shallow water colonies, while low-light, nutrient sufficient ones do not respond to it.

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**AULA MAGNA DI ANTROPOLOGIA**