

Holistic approaches through a marine groundbreaking plant-animal symbiosis: the Green Worms

Basic elements of the 2014 Exhibition at SCI-PI



Dr. Xavier BAILLY, CNRS – France,
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Based on the biology and ecology of Roscoff and Ushimado worms, a panel of scientific works realized during the last 15 years and still ongoing will be presented.

They combine applied, pedagogical and artistic approaches.

Animal photosymbioses - sustainable functional associations between photosynthetic organisms such as unicellular algae and animals – do not unusually partner in the living world. The history of biological life on Earth is unequivocally based on highly integrated combinations of distinct biological entities whose interactions - result in emergent properties. Photosymbiosis is not an exception in the oceans; coral species, although most emblematic of the ocean environment, are not the only animals coexisting with microalgae in their tissues. On some sandy beaches of Japan and France live colonies of small worms, Ushimado and Roscoff green worms. Their bright green color results from the presence of microalgae under their epidermis, in their tissues.

To understand the molecular bases, physiology and ecology of photosymbioses, it is necessary to have access to reference or proxy species whose life cycle is controlled in captivity: access to all stages of development, from early embryogenesis to the



Researchers and students of Roscoff Biological Station of Sorbonne University and the Ushimado Marine Institute of Okayama University, collaborate and exchange, conceptually and technically, to elucidate the biological mechanisms driving the establishment and life of photosymbioses of these two species, in their natural, sometimes disturbed environment.

Inquiry

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To understand the molecular bases, physiology and ecology of photosymbioses, it is necessary to have access to reference or proxy species whose life cycle is controlled in captivity: access to all stages of development, from early embryogenesis to the adult gravid stages, including the non-symbiotic states and the culture of free-living microalgae, allows us to follow holistically a large number of biological processes.

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