

Biodiversity in a rapidly changing world

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ABSTRACT :

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*Bioluminescence induction in *Amphiura filiformis**

Bioluminescence is the capability to emit visible light thanks to a biochemical reaction. About 80% of the known luminous species live in the marine environment. Among luminous substrates, coelenterazine is the most widespread luciferin found in at least eight phyla. The broad phylogenetic distribution of this light-emitting molecule led to the hypothesis of its dietary acquisition, so far demonstrated in one cnidarian and one lophogastrid shrimp species. Within Ophiuroidea, the dominant class of luminous Echinoderms, *Amphiura filiformis* is a brittle star model species known to use coelenterazine as substrate in a luciferin/luciferase reaction. A previous study performed long-term monitoring of *A. filiformis* luminescent capabilities maintained in captivity under controlled conditions. Our results showed (i) depletion of luminescent capabilities within five months when the ophiuroid was fed with a coelenterazine-free diet and (ii) after 15 months in captivity, *A. filiformis* showed a quick recovery of luminescent capabilities when fed with coelenterazine supplemented food. The results strongly support for the first time the trophic acquisition of coelenterazine in one brittle star. Work is in progress on *A. filiformis* to find: (i) does seasonal variations of luminescence capabilities exist; (ii) what is the natural source of coelenterazine in the sea, (iii) the transfer mechanism of coelenterazine from the stomach to the luminous cells, and (iv) how often the brittle star has to refill the stock of luminous substrate.

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