February 27, 2012 Monday 4 Adarl 5772 11:38 IST Print Back to original article

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'Glow-in-the-dark marine bacteria lure predators'

By SHARON UDASIN
26/02/2012

Hebrew University scientists are first to discover evolutionary justification for such bioluminescence.

Spookily shaped glow-in-the-dark ghouls are apparently not limited to late-night Halloween trick-or-treating, Hebrew University researchers have discovered.

A twinkling contingent of marine bacteria actually uses its light-up capabilities to lure in its plankton predators, who consume – but are unable to digest – the microscopic pathogens that then live off of and continue to glow inside the planktons' guts, according to the researchers. In turn, the now glowing plankton, usually zooplankton, attract the eyes of predatory fish who dine on them.

While the phenomenon of bioluminescence has long since been identified, the researchers have for the first time identified the reason why the marine bacteria glow – so that they might attract the predators that give them an environment of plentiful nutrition. Such conclusions recently appeared in the Proceedings of the National Academy of Sciences of the USA (PNAS), based on research carried out by graduate student Margarita Zarubin at the Inter-university Institute for Marine Sciences in Eilat under the supervision of Hebrew University Prof. Amatzia Genin, the head of the Evolution, Systematics and Ecology Department there.

Although it might seem counterintuitive that zooplankton would continue to be attracted to a species of bacteria that preys upon their digestive system, any luminescence in the water indicates to the plankton that there is a presence of rich organic material, some of which it might want to consume, according to Genin.

"It is worthwhile for the zooplankton to take the risk of becoming glowing themselves when contacting and consuming the particle with glowing bacteria, since the profit of finding rare food there is greater than the danger of exposing themselves to the relatively rare presence of predatory fish," Genin said.

In their research, the scientists discovered that nocturnal fish are able to easily detect and consume glowing zooplankton, but that the fish are not attracted to darker forms of the plankton.

Meanwhile, the bacteria that managed to thrive in the digestive systems of the zooplankton often are able to then prey upon the guts of the larger fish as well.

"As far as the bacteria are concerned, their access to the fish digestive systems is like reaching 'paradise' – a safe place, full of nutrients, and also a means of transport into the wide ocean," Genin said.

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