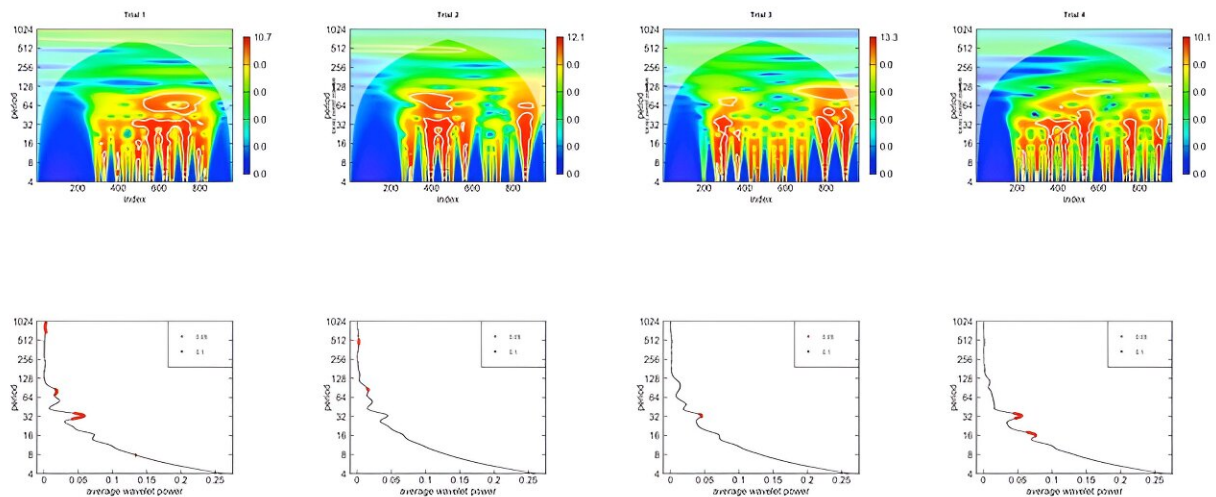


'Sea firefly' ostracods demonstrate collective synchrony with bioluminescent mating signals

November 29 2023, by Bob Yirka



Top row: Wavelet transformation of count observations over time from Trials 1–4, from left to right respectively. Bottom row: Average wavelet power for each observation trial. Strong signals are found in lower periods for each, with a consistent periodicity every 32 sec, and with secondary periods at 16 and 64 seconds. Periods are measured in seconds, corresponding to the sampling interval of the time series. Credit: *Proceedings of the Royal Society B: Biological Sciences* (2023). DOI: 10.1098/rspb.2023.2311

A team of evolutionary biologists and limnologists affiliated with multiple institutions in the U.S. has described the synchronous

bioluminescent signals they observed being produced by a type of marine ostracod (Crustacea; Luxorina). In their paper [published](#) in the journal *Proceedings of the Royal Society B*, the group describes their study of the synchronized mating behavior of the tiny creatures.

In 2017, members of the current research team were snorkeling off the waters of Panama when they happened upon a tiny [light](#) show displayed in the sea below them. Living in the seagrass were tiny ostracods that were bioluminescing in a way that the researchers had not seen before. Intrigued, they videotaped the behavior of the sand-grain-sized creatures and brought back samples to study in the lab. In so doing, they found an example of bioluminescent mating signaling that had not been documented before.

Taking a closer look at the tiny creatures, the research team found that they looked like tiny shrimp encased in round, see-through cases. The male had a unique organ situated just above the mouth. Watching the males in action, the team found that they exuded two types of mucus from the unique organ that when merged became bioluminescent.

The resulting bioluminescent mucous was then released in a way that the researchers describe as sort of a dance. The tiny creature would swim up out of the grass, then allow itself to fall gracefully back down following a corkscrew path—trailing mucus as it went. The result was reminiscent of a shooting star in [slow motion](#).

But there was more to the story. In watching the colony of ostracods, the research team found that their movements were orchestrated. They would interact with one another as they fell, creating a synchronized light show—presumably for the benefit of the females watching below.

The researchers suggest the entire light show was a mating ritual of a type that has not been seen before. They noted that individuals in the

show who were farther apart tended to produce more mucous, perhaps as a ploy to attract attention from a prospective mate. They also found that the characteristics of the light [show](#) were highly susceptible to foreign influence—a fish swimming by, for example, could change how it transpired.

More information: Nicholai M. Hensley et al, Collective synchrony of mating signals modulated by ecological cues and social signals in bioluminescent sea fireflies, *Proceedings of the Royal Society B: Biological Sciences* (2023). [DOI: 10.1098/rspb.2023.2311](https://doi.org/10.1098/rspb.2023.2311)

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