Medical Xpress

In the firefly's flash, seeking new insights on evolution

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From loud calls to flashing lights, animals use a wide array of signals to attract mates. Although these signals play a very important role in whether the organisms will mate and reproduce, scientists don't fully understand how new mating signals arise through evolution. A new study uses the firefly flashes that light up dark summer nights to gain insight into the evolutionary mechanisms that might have brought about the large assortment of signals displayed across the animal kingdom.

Fireflies are ideal for studying signal evolution because their flashing signal is not only obvious, but also varies among and within firefly species. Additionally, scientists have identified the primary genes and proteins involved in signaling and the reception of those signals: luciferase, which is involved in the chemical reaction producing the light , and opsin, the light-sensitive proteins found in eyes.

For the new study, researchers from Cornell University and the University of Georgia sought to find out if the genes involved in firefly signal production and reception showed variation that matched with changes in signal color, which would indicate that natural selection was acting on these genes. Using 192 individual North American fireflies from 12 populations of the same species, the researchers analyzed variations in the luciferase and opsin genes. They found that variations in light color didn't correlate with variations in either gene, which points to the possibility that natural selection might be acting on sequences of DNA that don't directly code for protein or on an unknown mechanism to induce variations in light color within this firefly species.

Sarah Sander will present this research on Thursday, July 14 from 5:30-5:45 p.m. during the James F. Crow Symposium in Crystal Ballroom J1 as part of The Allied Genetics Conference, Orlando World Center Marriott, Orlando, Florida.

Provided by Genetics Society of America