The mating system and alternate mating strategies of a marine bioluminescent Caribbean ostracode

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In shallow reef areas in the Caribbean there is a wide array of complex and formalized light displays at dusk. Each consists of patterns of bioluminescence secreted into the water by small (<2mm) myodocopid ostracodes (Crustacea). These displays are species-specific, produced only by the males, and are used for courtship. Observations of a grassbed species, of a new genus [*Photeros* sp], at Southwater Caye, Belize, indicate that they are the first crustacean species in which all criteria for a classic lek mating system are satisfied. The development of new observational techniques has allowed us to observe the swimming and display behavior of individual ostracodes in both the laboratory and the field. We find that males are able to switch readily between producing luminescent displays and “sneaking” on other males’ displays as an alternative mating strategy, and do so multiple times during a single night of courtship. Our study will increase our understanding of the rapidity and plasticity of alternate mating strategies. This is one of the first in-depth behavioral studies of the complex signals of any bioluminescent marine invertebrate, and could yield invaluable insights into the evolution of behavior of bioluminescent organisms in general, and of crustaceans in particular.