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Abstract: Mimicry and deception are two important issues in studies about animal communication. The reliability of animal signs and the problem of the benefits of deceiving in sign exchanges are interesting topics in the evolution of communication. In this paper, we intend to contribute to an understanding of deception by studying the case of aggressive signal mimicry in fireflies, investigated by James Lloyd. Firefly femmes fatales are specialized in mimicking the mating signals of other species of fireflies with the purpose of attracting responding males to become their prey. These aggressive mimics are a major factor in the survival and reproduction of both prey and predator. It is a case of deception through active falsification of information that leads to efficient predation by femmes fatales fireflies and triggered evolutionary processes in their preys' communicative behaviors. There are even nested coevolutionary interactions between these fireflies, leading to a remarkable system of deceptive and counterdeceptive signaling behaviors. We develop here a semiotic model of firefly deception and also consider ideas advanced by Lloyd about the evolution of communication, acknowledging that deception can be part of the explanation of why communication evolves towards increasing complexity. Increasingly complex sign exchanges between fireflies evolve in an extremely slow pace. Even if deceptive maneuvers are played out time and time again between particular firefly individuals, the evolution of the next level of complexity—and thus the next utterance in the dialogue between species—is likely to take an immense amount of generations.

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