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Dr. Martin Stevens

Department of Zoology, University of Cambridge

Host: A/P Li Daiqin

Host-parasite arms races and egg mimicry through avian eyes



Cuckoos and other brood parasites are cheats – they lay their eggs in the nests of other bird species, leaving all parental care to the host parents. One of the most striking outcomes of coevolution between species is egg mimicry by brood parasites, resulting from rejection behaviour by discriminating host parents. However, a number of key questions in this area remain. For example, how exactly do host parents detect a parasitic egg in their nest, what features of host egg appearance should parasites mimic most closely, and how can the arms race escalate over time? To answer these questions it is crucial to analyse the markings from a bird's, rather than a human perspective. For example, birds can see ultraviolet light, which humans cannot, and they probably see many more colors than we can. I will begin by discussing work in the common cuckoo, *Cuculus canorus*, and its various European hosts, investigating how the level of cuckoo egg mimicry, in terms of bird vision, is influenced by host rejection behaviour. I will also discuss how different scenarios in Australian cuckoos and hosts have arisen, specifically the evolution of cryptic cuckoo eggs to prevent detection by hosts with dark nests, and remarkable cases of chick mimicry. I will then discuss work on the African cuckoo finch, *Anomalospiza imberbis*, and its primary hosts. Both the cuckoo finch and its hosts have breathtaking diversity in egg appearance. Within species, egg colors laid by females can range from red, blue, white, to olive (to human eyes), overlaid with a stunning range of pattern types. I will discuss egg rejection experiments in Zambia and analysis of egg appearance to investigate how hosts can improve their defenses against the parasite, and how such high phenotypic diversity in egg coloration is the outcome of an ongoing arms race between the cuckoo finch and hosts.

About speaker: Martin Stevens undertook a PhD at Bristol on animal camouflage and bird vision. He is currently a BBSRC David Phillips Fellow based in the Department of Zoology, University of Cambridge. He is also a Fellow of Churchill College. Martin's research focuses on sensory ecology and behaviour, including animal coloration and vision, usually in birds but also in other organisms. Much of his work has investigated how different types of camouflage work from the perspective of a predator's visual system. Currently, a major area of research involves brood parasitism and cuckoos, in particular egg mimicry by parasites and rejection behaviour by hosts. In addition, he has also investigated how animal eyespots, common on fish and lepidoperans, work to deter predators, what makes an effective warning signal (aposematism), and the role of primate coloration as sexual signals of fertility and dominance. His work combines analysis of animal vision and field experiments.

