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## Host-parasite interactions drive the evolution of nestling ornamentation in birds – UCT research

A new study by researchers at the University of Cape Town's (UCT) [FitzPatrick Institute of African Ornithology](#) has found that coevolution with brood parasites has led to an increased rate of evolution in nestling ornamentation in a species rich group of finches (family Estrildidae). The research, published in the journal *Evolution*, sheds light on the complex interplay between hosts and parasites in shaping the evolution of juvenile traits in birds.

While the nestlings of most birds are cryptically patterned to avoid predators, the young of these Estrildid finches have bright and ornamented appearances. The Estrildid finches are a diverse family of small passerine birds that exhibit a remarkable variety of nestling mouth markings. Many estrildid finch species are hosts to brood-parasitic indigobirds and whydahs (*Vidua* finches), which mimic the appearance, begging calls and movements of host nestlings. This mimicry is a crucial adaptation for the parasites, as chicks with mismatching begging displays are fed less by host parents and have poorer survival.

The study examined the role of brood parasitism, predation, sibling competition and signaling environment in the diversification of nestling ornamentation. Researchers found that parasitised lineages of estrildid finches exhibit higher rates of nestling ornamentation evolution compared to unparasitised lineages. This key finding supports the hypothesis of a host-led coevolutionary arms race, where hosts evolve away from the mimetic parasite phenotype to better discriminate between their own offspring and the parasitic chicks. Interestingly, the study did not find that parasitised lineages had higher levels of ornamentation, suggesting that the evolutionary pressure is on changing the ornamentation, not necessarily increasing its complexity.

"Our findings provide rare empirical evidence for host-led coevolutionary diversification," said Dr Gabriel A. Jamie, lead author of the study. "This research helps us understand the evolutionary dynamics between brood parasites and their hosts, and how these interactions drive the diversification of nestling traits."

The authors highlighted that their results contrasted with studies on egg evolution, where coevolution often leads to increased complexity in host traits.

The research also revealed that species occupying denser habitats had increased nestling ornamentation. This suggests that the light environment plays a role in the evolution of

begging displays, potentially influencing the visibility and effectiveness of these signals in attracting parental care. However, the study found no evidence that predation pressure or sibling competition significantly influenced the evolution of nestling ornamentation in this group of finches.

This study provides compelling evidence for host-led coevolutionary diversification within an aggressive mimicry system. The research offers valuable insight into the dynamic and ongoing evolutionary battle between species by demonstrating the accelerated rate of evolutionary change in host nestling ornamentation driven by brood parasitism. "It highlights the intricate ways in which parasitic relationships can shape the biodiversity we observe and underscores the importance of studying these interactions to understand the mechanisms of evolutionary change," said Jamie.



A nestling Locust Finch (*Paludipasser locustella*) showing its ornamented mouth markings. Photo: Gabriel A. Jamie

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