

## **Cuckoos host range is associated positively with distribution range and negatively with evolutionary uniqueness**

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## **Abstract**

1. The evolutionary distinctiveness (ED) score is a measure of phylogenetic isolation that quantifies the evolutionary uniqueness of a species.
2. Here, we compared the ED score of parasitic and non-parasitic cuckoo species worldwide, to understand whether parental care or parasitism represent the largest amount of phylogenetic uniqueness. Next, we focused only on 46 cuckoo species characterized by brood parasitism with a known number of host species, we explored the associations among ED score, number of host species and breeding range size for these species. We assessed these associations using phylogenetic generalized least squares (PGLS) models, taking into account the phylogenetic signal.
3. Parasitic cuckoo species were not more unique in terms of evolutionary distinctiveness than non-parasitic species. However, we found a significant negative association between the evolutionary uniqueness and host range, and a positive correlation between the number of host species and range size of parasitic cuckoos, probably suggesting a passive sampling of hosts by parasitic species as the breeding range broadens.
4. The findings of this study showed that more generalist brood parasites occupied very different positions in a phylogenetic tree, suggesting that they have evolved independently within the Cuculiformes order. Finally, we demonstrated that specialist cuckoo species represent more evolutionary heritage in the Cuculiformes order.

**Key-words:** Cuculidae, distribution range, evolutionary uniqueness, host species richness, worldwide distribution