

Synchronicity in survival of four insectivores in a wetland in South Africa

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Abstract: Most demographic studies focus on a single species, but species are part of an ecological community in which several sympatric species occupy similar niches. The populations of these species face the same environmental changes and utilize similar resources. What drives population dynamics of similar species within a community is still a subject of debate. Compensatory-dynamics states that population dynamics are driven by competition: one species declines and others increase (Houlihan *et al.* 2007). This assumes that each species responds differently to environmental change - response asynchrony. If environmental change regulates population dynamics, species respond synchronously.

In Africa, data to estimate abundance are scarce (particularly for common, non-threatened species), but capture-recapture data to estimate survival are available through a public ringing scheme. We used ringing data (1999-2013) collected at Darvill Bird Sanctuary - a wetland near Pietermaritzburg in the east of South Africa - of four resident insectivores: Lesser Swamp-Warbler *Acrocephalus gracilirostris*, Levillant's Cisticola *Cisticola tinniens*, Tawny-flanked Prinia *Prinia subflava*, and Spectacled Weaver *Ploceus ocularis*. We investigated the (a) synchronicity in survival with a state-space model with a variance term per species and year (asynchronicity) and a common temporal variance (synchronicity) following Lahoz-Monfort *et al.* (2011).

The common temporal variance was not substantially larger than the species-specific temporal variance for the species that depend all year round on wetlands/vicinity of water (logit scale: 0.61, 95% Credible Interval (CRI): 0.08-1.326; swamp-warbler - 0.42, 95% CRI: 0.02-1.24; cisticola- 0.54, 95% CRI: 0.02-1.49; prinia - 0.43, 95% CRI: 0.08-1.43). This suggests that their survival is influenced by both competition and an asynchronous response to environmental factors. Survival of the spectacled weaver appears to be less influenced by competition than the other species (temporal variance: 0.92, 95% CRI: 0.04-2.43). It prefers well-wooded areas with abundant cover and only breeds near water.

References

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