Advanced reproductive phenology of an urban bird is not mirrored in the underlying reproductive physiology

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Introduction

For seasonally breeding animals, the decision of when to begin breeding each year has considerable effects on fitness. To synchronize breeding with optimal conditions, birds use environmental cues that predict conditions favorable for reproduction. Environmental conditions in urban areas of Phoenix differ from those of outlying desert areas in many respects.

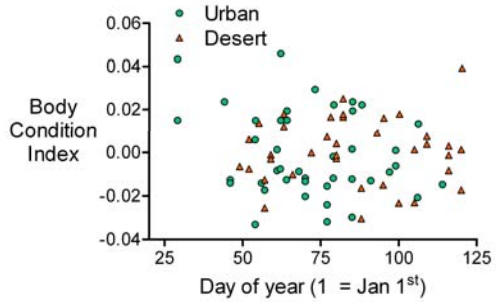
We hypothesized that environmental differences between urban and non-urban areas of Phoenix, AZ are associated with differences in the timing of development of reproductive morphology and physiology between urban and desert birds.

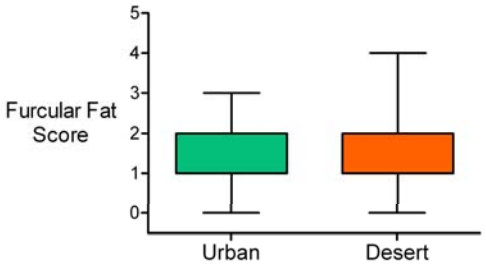
Methods

To test this hypothesis, we compared the development of gonads and cloacal protuberances (a secondary sexual characteristic in male birds) between urban and desert adult male Abert's Towhees, *Melozone aberti.*

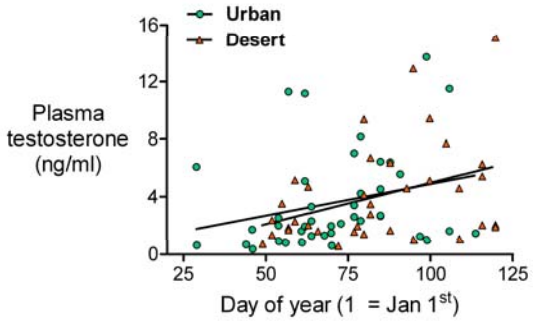
To investigate the mechanism controlling reproductive development, we also measured plasma concentrations of the key reproductive hormone testosterone, which promotes development of the cloacal protuberance and expression of reproductive behavior.

Results

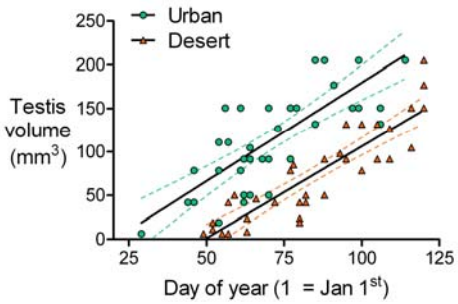


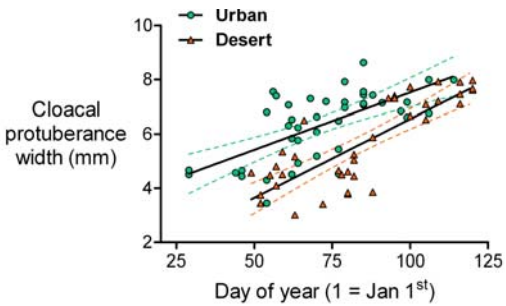


Body condition and fat scores were similar in urban and desert Abert's towhees. This finding suggests that the earlier initiation of reproductive development was not due to urban birds being in better condition or having greater energy stores.



The increase in plasma testosterone was similar in urban and desert Abert's towhees





Development of the testes and cloacal protuberance was advanced in urban Abert's towhees relative to desert conspecifics

Discussion

That urban birds initiated reproductive development earlier than non-urban conspecifics, despite similar energy stores, suggests that the environmental cues used by birds to time reproductive activity differ qualitatively and/or quantitatively (magnitude and/or timing) between the two habitats.

The observation that the development of reproductive morphology (testis volume and cloacal protuberance width) was advanced in urban birds despite similar testosterone levels between the two habitats is unclear. It may reflect the lability of plasma over short periods and/or it may suggest that physiological processes other than or in addition to reproductive hormones transduce environmental information to reproductive development.