

Behavior and stress hormone data may stem spread of invasive species

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(Phys.org)—A new University of South Florida study of house sparrows, which have become one of the world's most common invasive species, is providing scientists with physiological and behavior markers that could help keep them a step ahead of the next animal invasion.

In a paper published in an upcoming issue of the [Proceedings of the Royal Society B](#), USF doctoral candidate Andrea Liebl and Associate Professor Lynn Martin of the Department of [Integrative Biology](#) found

behavioral and stress hormone differences among house sparrow populations across Kenya, one of their most recent introduction sites.

The study is anticipated to give scientists a new tool to identify other high-risk invasive species, which can cause serious [economic consequences](#) all around the world and are most effectively controlled soon after they're introduced. If other invasive species - [Asian carp](#) in the Great Lakes, pythons in the [Florida Everglades](#) and [lionfish](#) in the Caribbean for example - also demonstrate these patterns, the scientists said it may be possible to contain the invasion by selectively culling the most adept individuals from populations.

"Anything we can use to stem a population before it gets out of control, it will save time and resources," said Martin, whose lab focuses on ecological physiology and how it influences species changes and adaptations. "Predictors of invasiveness - it's what resource managers are always looking for."

These findings are timely given [climate change](#) is forcing more species to seek new habitats and researchers seek new tools to determine how well native species are adapting to shifting environments. Those species or populations with the strongest exploratory tendencies or greatest ability to release stress hormones may endure climate changes best, the USF researchers said.

The study is based on fieldwork conducted by Liebl and Martin in 2010 and 2011 in Kenya. The common house sparrow is an adorable yet damaging species that originated in Eurasia and spread throughout the world. Often outcompeting native species, the house sparrow is blamed for driving out native birds in many places including Kenya and the United States. Liebl and Martin sought to understand what traits facilitated the birds' range expansion throughout Kenya and what makes it such a successful invader.

Comparing birds caught from the city of Mombasa, where the house sparrow was initially introduced in the 1950s, to cities further away such as Nairobi, Nakuru and Kakamega - which are 500 to 885 km from Mombasa - the scientists were able to note two key differences among eight populations. They found the birds farthest from Mombasa were more exploratory in novel environments and also released more [stress hormones](#) after being caught.

Liebl said glucocorticoids allow the birds to react to and survive stressors – allowing for a quicker response to new environments, potentially increasing their success there.

"As the climate changes, even more species will have to adapt to new environments," she said, and those that are most exploratory and/or responsive with their glucocorticoids may be the most successful.

Martin said the findings may allow scientists to test individual animals to determine which ones are more prone to spreading, and focus eradication efforts there.

The full text of the study can be found at the *Proceedings of the Royal Society B*: [rspb.royalsocietypublishing.org ... rspb.2012.1606.short](https://rspb.royalsocietypublishing.org/.../rspb.2012.1606.short)

More information: [doi: 10.1098/rspb.2012.1606](https://doi.org/10.1098/rspb.2012.1606)

Provided by University of South Florida

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