

Invasive sparrows immune cells sharpen as they spread

November 20 2013, by Vickie Chachere



When invasive species move into new areas, they often lose their natural enemies, including the microbes that make them sick. But new research from evolutionary biologists at the University of South Florida has found that adjustments in the immune system may help house sparrows, one of the world's most common bird species, thrive in new areas.

In research published this week in *Proceedings of the Royal Society B, Biological Sciences*, Associate Professor Lynn Martin and Assistant Professor Aaron Schrey from Armstrong Atlantic State University found that on the molecular level, the immune systems of house sparrows at the edge of the species' range in Kenya were more attuned to finding dangerous parasites than birds from older sites in the same country.

These differences may help keep invading birds from becoming sick in new areas where pathogens are more likely novel.

"A major function of the [immune system](#) is distinguishing self from non-self, and [immune cells](#) do this with special receptors that look for molecules made by microbes that animal cells don't make," Martin said.

"In the range edge populations, sparrows' immune cells expressed a lot more of the surveillance molecule for microbe components than in old sites. So, perhaps their immune systems are more attuned to finding particularly harmful parasites in new regions where parasites are more likely novel."

USF graduate student Courtney Coon and recent Ph.D. graduate Andrea Liebl, now post-doctoral researcher with the University of Exeter-Cornwall, were part of the research team.

Martin's lab has focused much of their efforts understanding how invasive species spread across the globe. Their main study species, also known as the English sparrow, spread rapidly across North and South America as well as Australia and now Africa and Southeast Asia since they were introduced from Western Europe more than 150 years ago.

Aggressive and often crowding out native species, the small but charismatic songbird is both adored, having been mentioned in Shakespeare's sonnets, and reviled for its voracious and destructive appetite for grain. In the United States, the house sparrow was often the target of organized eradication programs and is now implicated in the declines of other species because of its role in cycles of certain diseases.

Martin has focused on Kenya's sparrow population because it is one of the world's newest invasions of sparrows. Martin's newest research looked at how interactions between hosts and parasites influenced the

success of host species' introductions and range. Although other factors were important to predicting immune system variation, such as whether individuals were infected by malaria, the best predictor of was population age: birds from newer sites searched more for parasites than birds from old sites.

The ultimate goal of Martin's research is to understand what gives [invasive species](#) their edge, which could help government agencies focus resources on eradicating those species with the most potential to do damage to natural environments and influence how [species](#) are managed with respect to climate change and other anthropogenic factors such as urbanization.

More information: [rspb.royalsocietypublishing.org ...
1/1774/20132690.full](https://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2013.2690)

Provided by University of South Florida

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