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African alarm clocks: Hadeda ibises' sixth sense key to range expansion – UCT study reveals

UCT researchers unveil groundbreaking insights into Hadeda Ibis behavior, shedding light on global wetland bird ecology

Dr Carla du Toit and a study individual Hadeda Ibis.

A new study by an all-women research team – Dr Carla du Toit, Professor Anusuya Chinsamy and Associate Professor Susan Cunning from the University of Cape Town (UCT) – has unveiled the extraordinary sensory capabilities of Hadeda Ibises (Bostrychia hagedash), shedding light on their remarkable range expansion across Southern Africa. Published in the prestigious Journal of Avian Biology, the research highlights the pivotal role of human soil irrigation and the ibises' remote-tactile foraging abilities in driving their habitat expansion.

Led by Du Toit, a researcher from UCT's Biological Sciences Department and FitzPatrick Institute of African Ornithology, the study reveals that Hadeda Ibises possess a unique sensory adaptation that allows them to detect vibrations emitted by buried invertebrate prey, such as earthworms. Significantly, this ability is contingent upon the moisture content of the soil. As humans irrigate soils in suburban and agricultural areas, creating wetter substrates, the ibises capitalise on this environmental change to efficiently locate their prey, thereby facilitating their range expansion.

"The findings of our study underscore the crucial interplay between environmental factors and sensory ecology in shaping the distribution and behavior of wetland birds. Hadeda Ibises serve as a compelling example of how species adapt to anthropogenic modifications of their habitats," said Du Toit, whose doctoral thesis this study formed a part of.

Remote-touch, the ibises' sixth sense, enables them to detect vibrations from prey items in the substrate, akin to a fusion of touch, hearing, and echolocation. The research, conducted at the World of Birds sanctuary in Hout Bay, demonstrates that the ibises exhibit enhanced foraging success in wetter soils, where vibrations propagate more effectively.

The rapid adaptation of Hadeda Ibises to changes in soil moisture levels underscores their resilience and adaptability," notes Du Toit. "Understanding the sensory requirements of wetland birds is imperative for effective conservation strategies, particularly in the face of ongoing habitat alterations."

The study not only sheds light on the ecological dynamics of southern Africa but also has broader implications for the conservation of wetland and shorebird species worldwide. The research underscores the importance of considering animals' sensory ecology in habitat management and conservation efforts by illuminating the sensory mechanisms underlying foraging behavior.

Further analysis of the study's data suggests that Hadeda Ibises' range expansion correlates closely with human-induced soil irrigation. This phenomenon has not only facilitated the birds' foraging activities but has also led to their proliferation in suburban and agricultural landscapes. The ibises' characteristic loud calls have become a familiar feature in and around human settlements, marking a notable shift from their historical distribution in eastern regions of South Africa.

"Human activities have inadvertently paved the way for the expansion of Hadeda Ibises into new territories. As we continue to modify landscapes, it's crucial to consider the ecological implications and potential cascading effects on wildlife," added Du Toit.

Current work is looking at the tactile sensory systems of modern birds on a global scale, with the aim of understanding the function and evolution of these senses and the associated organs. Collaboration between UCT scientists and researchers at the University of Cambridge (where Du Toit is now based) and other institutions continues, spearheaded by a group of women and ignited by the study of a common South African garden bird species.

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