



UNIVERSITY OF SINDH JAMSHORO BARCODES GRASSHOPPERS IN PAKISTAN'S THAR DESERT

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Tracking the shift of non-pests to crop pests, a phenomenon accelerated by anthropogenic pressures in the Thar Desert.

The Thar Desert is considered the seventh largest desert in the world and the third largest in Asia. Although this desert is rich in unique biodiversity, efforts to explore and analyze its fauna and flora have been minimal. The desert harbours some important crop pests, particularly orthopterans, by providing them alternate host plants, overwintering space, and environments for reproduction.

The region provides favourable soil and environmental conditions for the survival of Acridids (grasshoppers and locusts). In particular, it supports the reproduction, development, and outbreak of the desert locust; the gregarious phase of locusts results in attacks on neighbouring regions that cause severe loss to crops and forests.

Around 20,000 orthopterans have been described in the world including 1,750 from India, but the number of known species in Pakistan is merely 161. Our recent surveys of the Thar region have revealed 29 species of grasshoppers that are new to the country indicating the rich grasshopper diversity of this desert.

With expanding agricultural fields, overgrazing and desertification, and changing ecological conditions, biodiversity is also changing. These changes are pushing non-pests to become crop pests, a phenomenon that warrants further investigation using reliable identification methods. An effective, preventive management strategy of these pests relies on an improved knowledge of their biology and ecology, and on more efficient monitoring and control techniques.

The Department of Zoology at the University of Sindh Jamshoro has taken initiative to document and understand the grasshopper fauna in the Thar Desert by coupling DNA barcoding with conventional taxonomy. With funding support from the Higher Education Commission (HEC) Pakistan, the department plans to develop a DNA barcode reference library for grasshoppers in the Thar Desert of Pakistan.

Grasshopper collection and specimen identification is already in progress and, so far, 2,334 specimens have been identified to 22 species while the identity of 300 specimens is yet to be resolved. After the front-end processing (data-basing, imaging, tissue sampling) at the University of Sindh Jamshoro is complete, the identified specimens will be barcoded at the Centre for Biodiversity Genomics, University of Guelph.

This is the first effort towards understanding grasshopper diversity in the Thar using DNA methods and developing a reliable reference library for this important group of pest insects. The generated data will not only be used for the rapid identification of grasshoppers and locusts, it will also provide a useful tool for pest management and biodiversity conservation.

Online:

<https://ibol.org/barcodebulletin/research/university-of-sindh-jamshoro-barcodes-grasshoppers-in-pakistans-thar-desert/>



Cattle grazing in the Thar region.
PHOTO CREDIT: Ahmed Ali Samejo



Field surveys in the Thar Desert with Kumar, Riffat, and Samejo (left to right).
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