

Genetic study of plains zebra finds that six subspecies made by appearance-only do not match genetic evidence

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A team of researchers with members from Denmark, the U.S., Portugal and France has found that the six subspecies classifications currently

used to categorize plains zebras living in Africa do not match with genetic evidence. In their paper published in the journal *Nature Ecology & Evolution*, the group describes their DNA analysis of zebras living in several parts of Africa and what they found by doing so.

Zebras are among the iconic animals of Africa. With their black and white stripes, they are one of the more recognizable creatures living on the continent today. They live mostly in the savanna of southern and eastern Africa and survive by eating generally low-quality forage. Unfortunately, like so many other animals, they are at risk due to loss of habitat, and conservationists are looking for ways to help them. That should start, the researchers with this new effort claim, with correctly classifying them.

For many years, conservationists have classified plains zebras by the shape of their head and their pattern of stripes. This has resulted in six broad classifications used when reporting on zebras and developing efforts to protect them, but now, it appears the six categories do not correspond with genetic lineage.

To develop more meaningful classifications, the researchers collected samples from 59 plains zebras representing multiple sites across Africa—they also included samples from three mountain zebras and three Grevy's zebras. Analysis of the DNA evidence suggested that there are actually nine populations of plains zebras with distinct evolutionary properties, only two of which overlap with the traditional categorizations.

Grouping zebras by genetic factors, the team notes, is important for conservation efforts, because it ensures enough diversity among [zebra](#) populations. The team actually found an example of this—two groups of Zebras living in Uganda showed remarkably low diversity, which needs to be addressed if the groups are to survive.

In studying the DNA data, the researchers also found that the extinct creature "quagga" was a subspecies of the plains zebras and not a unique species, as some have suggested. And they also found that the birthplace of the plains zebras was in the wetlands of southern Africa.

More information: Casper-Emil T. Pedersen et al. A southern African origin and cryptic structure in the highly mobile plains zebra, *Nature Ecology & Evolution* (2018). [DOI: 10.1038/s41559-017-0453-7](https://doi.org/10.1038/s41559-017-0453-7)

Abstract

The plains zebra (*Equus quagga*) is an ecologically important species of the African savannah. It is also one of the most numerous and widely distributed ungulates, and six subspecies have been described based on morphological variation. However, the within-species evolutionary processes have been difficult to resolve due to its high mobility and a lack of consensus regarding the population structure. We obtained genome-wide DNA polymorphism data from more than 167,000 loci for 59 plains zebras from across the species range, encompassing all recognized extant subspecies, as well as three mountain zebras (*Equus zebra*) and three Grevy's zebras (*Equus grevyi*). Surprisingly, the population genetic structure does not mirror the morphology-based subspecies delineation, underlining the dangers of basing management units exclusively on morphological variation. We use demographic modelling to provide insights into the past phylogeography of the species. The results identify a southern African location as the most likely source region from which all extant populations expanded around 370,000 years ago. We show evidence for inclusion of the extinct and phenotypically divergent quagga (*Equus quaggaquagga*) in the plains zebra variation and reveal that it was less divergent from the other subspecies than the northernmost (Ugandan) extant population.

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