

Tail hairs reveal dietary choices of three horse species in the Gobi Desert

November 30 2016

Przewalski's horse, a species of wild horse that has been successfully reintroduced to the Gobi Desert, shares its pasture grounds with wild asses and free-roaming domestic horses. A scarce supply of food could lead to food competition among the different species, especially if they make the same dietary choices. A team led by researchers from Vetmeduni Vienna therefore chemically analysed the tail hairs of the animals to determine the seasonal dietary habits of the three species. While the wild ass switches from being a grazer in the summer to also browse in the winter, the wild and domestic horses eat exclusively grass all year round. In the lean winter months, this leads to increased food competition between wild and domestic horses. This realisation could help improve wildlife management measures for the Przewalski's horse in the future. The study was published in the *Journal of Applied Ecology*.

Przewalski's horses went extinct in the wild in 1968. Successful breeding programmes at zoos around the world helped to reintroduce the animals in the Great Gobi B protected area in southwestern Mongolia since 1992. The wild horses share the extreme habitat of the Gobi Desert with two other equid species: the Asiatic wild ass, also called khulan, and the free-ranging domestic horses of local nomads. For the preservation of the wild Przewalski's horse, it is important to understand if and how the three related species compete for food in the protected area.

Competition between Przewalski's horses and domestic horses in the winter

Martina Burnik Šturm and Petra Kaczensky from the Research Institute of Wildlife Ecology at Vetmeduni Vienna, in cooperation with the Leibniz Institute for Zoo and Wildlife Research in Berlin, used a special method based on the chemical analysis of tail hairs to investigate the [dietary habits](#) of the animals. The analysis allowed them to determine the composition of the diet of each of the three species, which led to the discovery of increased dietary competition in the winter months.

The chemical analysis of the tail hairs revealed that Przewalski's horses and domestic horses are year-round grazers. Khulan, on the other hand, switch from grazing in the summer to a high proportion of foliage in the winter. "When food becomes scarce in the long winter months, competition can be expected especially between the two species of horse," explains Martina Burnik Šturm.

Competition considerably less in the summer

In the summer, the food supply is relatively high. At the same time, the local nomads leave the Gobi and take their horses to the high pastures of the surrounding mountains. "In the hot season, Przewalski's horses mainly graze near sources of water. Khulan, on the other hand, also graze on pastures far from water sources as they are better able to conserve water. The potential for pasture competition in the summer is therefore relatively low among the three species in the Great Gobi B protected area," adds Petra Kaczensky.

Chemical composition of the hairs holds information about dietary choices

The chemical analysis used by Burnik Šturm and Kaczensky measures so-called stable isotopes in the tail hairs. "Stable isotopes are atoms of the same chemical element with the same number of protons but

different number of neutrons and thus with different masses. The [isotope values](#) in the body tissue of living organisms are the result of the isotope values in the environment and of the animal's metabolism," explains Burnik Šturm. Grasses and shrubs in the Gobi Desert exhibit different values of carbon isotopes, which make it possible to differentiate between grazers and browsers.

Because the tail hairs of horses grow at a regular rate, they act as an archive storing the isotope values at each growth stage. The longer the hair, the farther back into the past the researchers can look. "If you know how fast the hairs grow, you can date specific hair segments and clearly assign them to a certain season. Consecutive hair segments therefore provide valuable information about the diet and water balance of an individual animal," explains Burnik Šturm.

Protected area in the Gobi Desert to secure the survival of Przewalski's horse

International research teams, under the direction of Vetmeduni Vienna and in close cooperation with the Great Gobi B protected area, have for years been committed to the reintroduction programme in the Gobi Desert. The long-term goal is to establish a self-sustaining and viable population of Przewalski's horses, but also to protect other key species such as the khulan. An exact understanding of the dietary behaviour of the Przewalski's horse and the khulan are important for improving the conditions in the protected area. The high potential for pasture competition between domestic and wild horses highlights the need for stricter regulation and a restriction on the grazing of [domestic horses](#). The establishment of artificial water sources should be well considered to avoid infringing on the khulan's areas of retreat.

More information: Martina Burnik Šturm et al. Sequential stable

isotope analysis reveals differences in dietary history of three sympatric equid species in the Mongolian Gobi, *Journal of Applied Ecology* (2016).
[DOI: 10.1111/1365-2664.12825](https://doi.org/10.1111/1365-2664.12825)

Provided by University of Veterinary Medicine—Vienna

Citation: Tail hairs reveal dietary choices of three horse species in the Gobi Desert (2016, November 30) retrieved 20 March 2024 from <https://phys.org/news/2016-11-tail-hairs-reveal-dietary-choices.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--