

HIMALAYAN WOLVES WITH HYPOXIA ADAPTATION ARE SEPARATE SPECIES

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Himalayan wolves, also called as Tibetan wolves, which live at more than 4,000 metres altitudes are genetically distinct from grey wolves, according to a study published in the *Journal of Biogeography*. The divergence of Himalayan wolves relates to past uplift of the region, the authors of the paper note.

Living at such high altitudes, these wolves have genetically adapted themselves to live in low oxygen (hypoxic) conditions. While effective oxygen availability at sea level is nearly 22%, at 4,000 metres altitude, the effective oxygen availability is nearly half — 12.7%.

The researchers collected 280 wolf faeces from across the Tibetan Plateau of China, Kyrgyzstan and Tajikistan and studied the mitochondrial DNA. A subset of 110 samples was genotyped too. The genetic analysis revealed a clear divergence of Himalayan wolves and marked them as separate breed. There was considerable admixture at the lower edges of the range.

The study based on mitochondrial DNA supports an early divergence for the Himalayan wolves, making them the sister taxon to the grey wolves. The nuclear genome markers analysed also suggests differences between Himalayan wolves and grey wolves. But other studies suggest a recent ancestry for all extant wolf lineages.

Interestingly, unlike the grey wolves that inhabit the lower elevations the Himalayan wolves showed clear hypoxia adaptation. The admixed wolves had a mixture of genes belonging to Himalayan wolves and grey wolves but always carried the Himalayan wolf hypoxia adaptation.

The specialised genes for hypoxia adaptation allowed the animals to overcome the lack of oxygen at such high altitudes. Such adaptations are seen in dogs and humans to mitigate the deleterious effects of free radicals that are produced in response to low oxygen availability. While the precise genetic mechanism that facilitates humans to live in hypoxic conditions remain poorly understood, interbreeding of wolves and dogs is how the dogs might have acquired high-altitude adaptation.

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The WHO had to come up the name in line with the 2015 guidelines between the global agency, the World Organisation for Animal Health and the Food and Agriculture Organization.

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