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## The biogeographic basis of Ebola-virus disease outbreaks: A model for other zoonotic diseases?

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We first determined the differential role of favorability of environmental conditions and mammalian chorotypes in explaining the presence of the Ebola virus in Africa. We then combined environmental factors and chorotypes using fuzzy logic, which better explained the distribution of Ebola virus. The core area for the virus was associated with human infections of known animal origin, with infections of unknown source detected in areas that are biogeographically more peripheral. Variation in the environmental favorability for disease outbreaks may be monitored using indices of macroclimatic oscillations. This may provide the basis for an early warning system based on the variation in macroclimatic indices and the locations where human contact with multiple animal species tend to occur. We propose to study the biogeography of zoonoses by: 1) determining the potential spatial distribution of these diseases, according to environmental factors and the biogeographic structure of animals linked to the zoonosis cycle; 2) search for relationships between disease outbreaks and global atmospheric oscillations to forecast periods of higher risk of emergence of the infectious diseases.

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## Are we reaching the end for the taxonomy of mammals? A case from the revision of a most common and dominant wild rat species complex in China (Rodentia, Murinae)

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Mammals represent one of the best studied group of animals in the world; however, the taxonomy of several small-sized taxa remains lagging behind, particularly in regions that are short of extensive exploration and systematic revisions. It is worrying that the team of taxonomists largely shranked in recent years even though there are a large number of taxa remaining poorly explored and unstudied. We present one example for the necessity of a comprehensive revision on these animals. The *N. confucianus* species complex (NCSC) is one of the most common and dominant, but taxonomically ambiguous, small mammal taxa in southeast Asia and China. More than 20 species or subspecies had been described in historical literature. Based on extensive sampling and integrating information from molecular data and morphological data, we verified their distribution range and tested the genetic divergence, morphological differentiation among different species, and subspecies. Distribution of molecular voucher specimens revealed previous studies largely overestimated the distribution of *N. confucianus* with a large number of misidentifications in the literature and museum collections. Morphological analysis demonstrated significant divergence amongst genetic clades and geographical populations, highlighting quick diversification of these taxa. Taxonomic revision modified the species status of several taxa and established two new species from Tibet and China.

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## Individual identity in hind and calf contact calls of Siberian wapiti *Cervus elaphus sibiricus* during separation

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Mother-offspring vocal recognition is critically important for survival of the young for many mammal taxa. Vocal identity in contact calls facilitates mothers-offspring reunions and prevents allosuckling. Hind and calf calls encode identity in many cervids, but not Siberian wapiti, *Cervus elaphus sibiricus*, an important animal farmed for velvet antlers, this information is lacking. Contact calls of mothers and 5-6 month old offspring were collected on the farm during 5 days after separation for winter keeping in December 2015. We recorded and analysed 134 oral (open-mouth) calls from 9 hinds (14-15 per individual) and 129 oral calls from 9 calves (10-15 per individual). The maximum fundamental frequency of hind calls (1.44±0.25 kHz) was as high as in calf calls (1.46±0.24 kHz; $F_{1,16}$=0.04, p=0.85). Vocal identity was well expressed in both hinds and calves; discriminant analysis based on 11 acoustic variables accurately classified individuals in 92.5% hind calls and 96.9% calf calls (chi-square test, p=0.19). Variables contributing most to vocal individuality (duration, start and maximum fundamental frequency) were the same in hind and calf calls. Distinctive to Siberian wapiti, in Iberian red deer *C. e. hispanicus*, the maximum fundamental frequency of hind calls (0.21±0.04 kHz) was significantly lower than in 4-month-old calves (0.57±0.05 kHz). In Siberian wapiti hinds and calves, vocal individuality exceeded those of Iberian red deer hinds (77.0% calls of 22 mothers) and calves (61.1% calls of 17 young). We discuss the role of individuality and differences in contact calls across subspecies of red deer. Supported by RSF, grant 14-14-00237.