

## VIEWPOINT

# Revised Taxonomic Binomials Jeopardize Protective Wildlife Legislation

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## Abstract

Due to revised phylogenies and newly discovered biogeographic distributions, scientific binomials are being amended continuously. Problematic is that wildlife protection legislation tends not to keep pace with these reappraisals, creating a wide range of legislative loopholes and potentially compromising ability to prosecute illegal wildlife trade (IWT). This serious and growing international problem proves particularly challenging in China because binomials used on China's national legislation have not been updated since 1989, alongside the enormous issues of IWT in this megadiverse nation. Here, we focus especially on mammals, because these support lucrative criminal markets and receive the greatest international policing efforts; however, all protected taxa are vulnerable to this misnaming ambiguity. To date, the names of 25 threatened species, including 18 mammals, have become incongruent with Chinese law. Additionally, two primate species, newly discovered within China, have not yet been incorporated into Chinese law. A further six mammalian species are known by different synonyms between Chinese law and CITES, hindering international policing and compilation of data on IWT. Taxonomic revisions similarly undermine legislation in other megadiverse countries; posing a critical risk to wildlife protection worldwide. We recommend that scientific binomials must be updated systematically across all 181 CITES signatory nations.

*"What's in a name?"* To prevent prosecutions being dismissed or acquitted inappropriately, it is essential that fauna and flora vulnerable to wildlife crime can be identified clearly and unequivocally by a legally binding name, recognized by both national laws and international conventions. Changes to taxonomic binomials (generic and specific), arising through newly discovered geographical distributions and phylogenetic relationships therefore necessitate corresponding updates to protective legislation (Zhou *et al.* 2015). In developing countries, such as China, failure to amend legislation risks legal ambiguity, threatening ability to prosecute illegal wildlife trade.

China's List of Fauna under Special State Protection (LFSSP, 1989) has not been updated since it was implemented in 1989. Consequently, the taxonomic names of 18 of 232 vertebrate taxa (including 13/82 mammals) no longer concord with Species+ (<http://www.speciesplus.net/>, a database defining the legal names, protection status, and distributions of all CITES Appendix species; Appendix S1, Table S1), with ramifications jeopardizing the effective prosecution of wildlife crime globally.

A further complication is whether species are—legally—considered native or exotic. Twenty-one vertebrate species (18 mammals) that do *not* appear on China's

LFSSP are now considered native to China according to Species+ (Table S2), arising from the discovery of new population distributions and phylogenetic relationships.

For instance, currently only the Chinese pangolin (*Manis pentadactyla*) is listed as native on China's LFSSP, with other exotic pangolin species receiving protection under CITES Appendix II. However, taxonomists now propose that Malayan (*M. javanica*) and Indian (*M. crassicaudata*) pangolins are actually native to China—with population distributions corroborated by Species+. This reappraisal of the geographic status of these pangolins means that if they are confiscated within China their trade can no longer be claimed to be implicitly international and in automatic violation of CITES Appendix II, unless being trafficked unequivocally across China's borders. Therefore, unless China adds these pangolin species to its LFSSP as natives, trade in *M. javanica* and *M. crassicaudata* will inevitably become completely unrestricted and “legal” in China; although this defense has yet to be used in a Chinese court (Zhou et al. 2014). A similar situation exists for the Burmese Python, where only *Python molurus* is listed on the LFSSP, but *Python bivittatus* is also now recorded as native to China by Species+.

A related problem involves name inconsistencies. For instance, the Chinese goral (a goat-like ungulate), is listed on the LFSSP under the name “*Naemorhedus goral*,” which Wilson & Reeder (2005) split into three species; the Himalayan goral (*N. goral*) in southern Tibet (still protected under the LFSSP), the Long-tailed goral (*N. caudatus*) in the northeast of China, and the Chinese goral (*N. griseus*) throughout the rest of China; where this latter pair are currently not named on the LFSSP.

Instances where a subspecies native to China has become elevated to full species status complicate this issue further, where the new scientific name must be added to the LFSSP to ensure ongoing protection. For example, the LFSSP still lists just the obsolete Chinese mainland serow (another goat-like ungulate), as *Capricornis sumatraensis*, despite in 2005 this species having been split taxonomically into the Chinese serow (*C. milneedwardsii*) and the Sumatran serow (*C. sumatraensis*), which is indigenous to Indonesia, Malaysia, and Thailand (Wilson & Reeder 2005), and thus subject to CITES.

Revisions to genus classification also have broad implications when the abbreviation “spp.” is used to denote all species in a genus. For instance, the LFSSP includes all leaf monkeys in China under the generic name of “*Presbytis* spp.,” provided with the highest legal protection. However, in 2005, Chinese leaf monkeys were reassigned into two genera: *Trachypithecus* and *Semnopithecus*. Those retaining the generic name *Presbytis* spp. now occur only outside China, in other Southeast Asian countries (Wilson & Reeder 2005). Alarming,

because these new generic names do not appear on the LFSSP, leaf monkeys are now completely devoid of any formal protected status in China.

Despite these anachronisms, lawyers and courts in China are currently still managing to secure prosecutions under the LFSSP, and can apply a maximum penalty of 20 years' imprisonment for trafficking or hunting these threatened species within China (compared to life imprisonment for smuggling across borders). Of concern, however, is that criminal cartels perpetrating wildlife crime are becoming aware that prosecutions under outdated LFSSP names are no longer robust. New litigants will likely soon succeed in creating uncertainty, and sufficient “reasonable doubt” to evade prosecution; also leading those convicted to appeal their sentences.

Indeed, China lags behind its neighbors: Vietnam's List of Rare and Precious Plant and Animal Species was last updated in 2006; Schedule VII to India's Wildlife (Protection) Amendment Act was updated in 2013. Worryingly, among the 17 megadiverse countries (Mittermeier 1997), only five have updated their protected species lists since 2007 (Table S3). Even among countries that apply a more rigorous and frequent review of species names used in wildlife legislation, involving recommendations from taxonomists and biogeographers, national conservation laws are continually outpaced by taxonomic revisions, and become inconsistent internationally.

This was illustrated by a high-profile case, costing millions of dollars in attorney fees, involving a type of wild sheep, the Chinese argali (*Ovis ammon*). When on April 16, 1988, U.S. authorities apprehended hunters at San Francisco Airport returning from Qinghai Province carrying valuable argali trophies, it proved taxonomically ambiguous to decide if these were other native Chinese subspecies or actually the Tibetan argali (*O. a. hodgsoni*) subspecies, listed under the Endangered Species Act.

Although we focus here on vertebrates—and on mammals in particular because they are focal to concerns over cruelty—this issue of reappraising taxonomic status has obvious conservation application to all species. We advocate that all 181 signatory nations to CITES adopt a standardized and coherent naming policy across their national protected lists, mirroring the up-to-date taxonomic classification of globally protected species provided by Species+. We also note similar anomalies in taxonomic names between CITES and the Convention on the Conservation of Migratory Species of Wild Animals and those given on the IUCN Red List (Table S4). It is thus crucial to reach an international consensus to redress legal ambiguities within nations and to alleviate transborder inconsistencies afflicting international wildlife enforcement agencies.

## Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

**Appendix S1.** China's legislative framework and the Species+ database.

**Figure S1.** The cascade of legal jurisdiction and penalties for wild animal crime within Chinese borders in relation to the species' taxonomic name and distribution.

**Table S1.** Name inconsistencies between LFSSP and Species+.

**Table S2.** Candidates for addition to China's LFSSP\*.

**Table S3.** Year in which latest revision of wildlife legislation was made among megadiverse countries.

**Table S4.** Examples of anomalies in taxonomic names between CITES and the IUCN Red List.

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