Prevent culture-driven invasive species spread

Authors: Xiong Li, Supriyo Basak, Rui Zhou, Wei-zhe Zhang, Yao Fu, Xin-mao Zhou, Chao Shi, Hou-Cheng Xi, Yong-ping Yang, Yong-ping Yang

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Abstract

Regional culture (such as religious, dietary, or tourism culture) can sometimes drive the spread of invasive species; we must take measures to prevent invasive species from integrating into popular culture.

Full Text

Preamble

Preventing Culture-Driven Invasive Species Spread

Xiong Li[12], *Supriyo Basak[23], Rui Zhou , Wei-zhe Zhang , Yao Fu[3], Xin-mao Zhou , Chao Shi[1], Hou-cheng Xi , Yong-ping Yang[12]*

[1]Key Laboratory for Plant Diversity and Biogeography of East Asia, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650201, China
[2]China Germplasm Bank of Wild Species, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650201, China
[3]Department of Economic Plants and Biotechnology, Yunnan Key Laboratory for Wild Plant Resources, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming 650201, China
Institute of Ecology and Geobotany, Yunnan University, Kunming 650091, China
Fairy Lake Botanical Garden, Shenzhen & Chinese Academy of Sciences, Shenzhen 518004, China
Gardening and Horticulture Department, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Xishuangbanna 666303, China

Correspondence to: X. Li, E-mail: lixiong@mail.kib.ac.cn; Y. P. Yang, E-mail: yangyp@mail.kib.ac.cn

Biological invasions are known to threaten global biodiversity, economies, and human health (1, 2). Nevertheless, human activities have greatly contributed

to biological invasion processes (3).

In some cases, regional culture (e.g., religion, food, and/or tourism culture) plays a driving role in the spread of invasive species. For example, the alien plant *Cosmos bipinnatus* is often mistaken for the Chinese Tibetan culture' s rumored holy plant "Galsang flower" (4), which causes large-scale cultivation and establishment of natural populations of the former in and around the Tibetan Plateau, thereby threatening local plant populations. Each year, billions of animal and plant individuals are translocated and released into settings worldwide (partly driven by religious beliefs and/or unscientific environmentalism), resulting in massive inflow of alien species into wild populations (5). Moreover, ethnic and rural communities in some countries occasionally consume wild animals and/or plants (excluding protected species) (6, 7), and their harvesting, breeding, and trading behaviors inevitably promote further invasion of those edible invasive species (8).

Compared with the limited availability of human resources (scientists, government departments, and/or commonweal organizations) for controlling invasive species, the culture-driven public' s contribution to the spread of invasive species can cause incalculable ecological consequences. Thus, we must implement measures to prevent invasive species from becoming part of public culture. First, distribution ranges of alien invasive species must be promptly monitored and risk assessments made. Then, the concept of invasive species and their harmful impacts can be publicized through popular media (e.g., via social media, news websites, and TV ads) and governments can publicize on billboards areas within the ranges of invasive species. Additionally, scientists can help abbots, imams, and priests to learn and then disseminate relevant biological knowledge to religious believers, and tour guides can be trained to disseminate invasive species information to tourists. Finally, appropriate policies or laws must restrict blind use of invasive species.

We hope that scientists can focus on this issue before the upcoming International Day for Biological Diversity (May 22nd, 2019) and discuss relevant policies and initiatives on the fifteenth Conference of the Parties to the Convention on Biological Diversity in 2020 in Kunming, China (9).

References

1. Mazza, G., Tricarico, E., Genovesi, P. & Gherardi, F. Ethol Ecol Evol 26, 112-129 (2014).

3. Hulme, P. E. J Appl Ecol 46, 10-18 (2009).

4. "Galsang flower" spreads in Lijiang. Experts warn that it belongs to invasive species and may lead to ecological disasters (ThePaper.cn, 2014); https://www.thepaper.cn/newsDetail_forward_1273770.

5. Laikre, L., Schwartz, M. K., Waples, R. S., Ryman, N. & Ge, M. W. G. Trends Ecol Evol 25, 520-529 (2010).

7. Milner-Gulland, E. J., Bennett, E. L. & Meat, S. A. m. W. Trends Ecol Evol 18, 351-357 (2003).

8. Nuñez, M. A., Kuebbing, S., Dimarco, R. D. & Simberloff, D. Conserv Lett 5, 334-341 (2012).

9. The Fifteenth Conference of the Parties to the Convention on Biological Diversity will be held in Kunming (People' s Government of Yunnan Province, 2019); http://www.yn.gov.cn/yn_ynyw/201903/t20190301_65935.html.

Note: Figure translations are in progress. See original paper for figures.