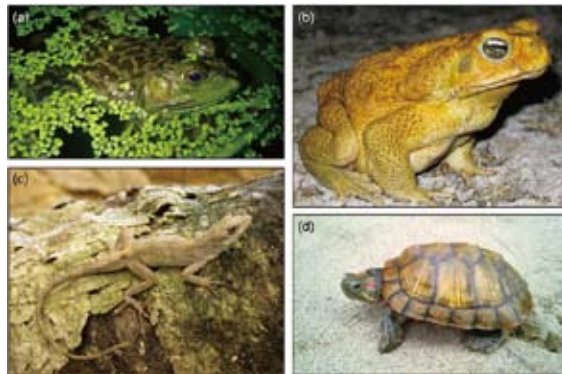


Biodiversity Hotspots More at Risk of Alien Invasion, Study Finds

Biological invasion is a major threat to global biodiversity and ecosystem functioning. Understanding where invasion hotspots are located and how they overlap with biodiversity hotspots is crucial for prioritizing conservation efforts to prevent or mitigate the impacts of alien species on global biodiversity.

Using an ensemble of five species-distribution models based on climate, anthropogenic predictors, vegetation and water resources, a research team led by LI Yiming from the Institute of Zoology, Chinese Academy of Sciences recently predicted global potential invasion hotspots, such as environmental conditions suitable for numerous alien species for alien herpetofauna (including 98 amphibian species and 181 reptiles species) under current and projected climates – the 2050s and the 2080s. The alien herpetofauna included a number of the most notorious globally invasive species, for instance the American bullfrog (*Lithobates catesbeianus*), Cane toad (*Rhinella marina*), Brown anole (*Anolis sagrei*), and Red-eared slider (*Trachemys scripta elegans*), which can exert serious ecological, evolutionary and societal impacts upon their invaded regions.

Models show that under the current climate, the areas liable to invasion by the greatest number of alien herpetofauna occur in western Africa, South and Southeast Asia, Caribbean, eastern South America, Mediterranean region, and eastern Madagascar. Under future climates, meanwhile, these hotspots will expand toward the north of South America, into central Africa and toward high latitude areas of Europe, where newly suitable environmental conditions will be created. In contrast, some areas such as western South America, the countries bordering the Red Sea, and northern and southern Africa may become less susceptible to invasion. Herpetofaunal invasion hotspots are mostly



Four species of invasive herpetofauna. (a) The American bullfrog (*Lithobates catesbeianus*) is responsible for spreading the chytrid fungus that has caused amphibian population declines and is a predator and competitor of many small vertebrates; (b) the cane toad (*Rhinella marina*) has poisoned native predators in Australia; (c) the brown anole (*Anolis sagrei*) outcompetes and consumes native lizards; and (d) red-eared sliders (*Trachemys scripta*) hybridize with and compete with native turtles.

distributed in biodiversity hotspots. The potential richness of alien herpetofaunal species per unit area in a biodiversity hotspot is 1.4 times higher than those in ordinary regions. Furthermore, the invasion hotspots are projected to occupy a large proportion of total area within biodiversity hotspots.

These results suggested that biodiversity hotspots are more at risk from alien herpetofaunal invasion than are other regions. They provided key information for globally targeting early detection and rapid-response programs to reduce the negative effects of alien herpetofauna on biodiversity under current and projected future climates.

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