

## Collaborative work brings hope for threatened harlequin toads

Distributed in 11 countries in Central and South America, from tropical and montane forests to paramos, harlequin toads *Atelopus* spp. are highly threatened. According to the IUCN Red List, 83% of *Atelopus* species are threatened with extinction, with 40% possibly extinct in the wild and four species already extinct. Most *Atelopus* species have very small populations within severely reduced ranges, often in montane ecosystems, which makes them particularly susceptible to a myriad of threats, including infectious diseases, habitat loss and degradation, invasive species, illegal collection and climate change.

Individuals and organizations from several countries have recently joined forces to establish the *Atelopus* Survival Initiative, a collaborative and coordinated effort that unites and mobilizes a wide range of national and international stakeholders to implement substantial, long-term and comprehensive conservation measures to prevent the extinction of *Atelopus*.

In November 2019, 38 specialists from 11 countries, including seven where *Atelopus* species occur, convened in Medellín, Colombia, to identify and prioritize key strategic actions to ensure the survival of harlequin toads. As a result of this meeting and following 2 years of work, the Initiative was launched on 25 August 2021, together with the publication of the Harlequin Toad (*Atelopus*) Conservation Action Plan. Guided by the scientific expertise of the IUCN Species Survival Commission (Amphibian and Conservation Planning Specialist Groups, and *Atelopus* Task Force) and following the IUCN One Plan Approach, the Action Plan is envisioned as a cost-effective, simple, and dynamic plan to be implemented locally, taking into account the social, political and cultural realities of each country.

The Action Plan proposes the joint development of management and conservation actions agreed, conducted and implemented by all responsible parties, within or beyond the natural range of *Atelopus*. It outlines regional conservation priorities and identifies needs at local, national, regional and international levels that must be implemented over the next 20 years to achieve a shared vision by 2041, the 200th anniversary of the description of the genus.

The Action Plan promotes strategies to synchronize efforts and exchange resources, knowledge, and capacities among stakeholders through regional coordination and inter- and multi-disciplinary approaches to: (1) produce baseline knowledge, (2) ensure viable populations in natural habitats, (3) maintain and manage captive populations for future reintroduction, (4) increase awareness of *Atelopus*, and (5) foster multi-stakeholder collaboration and participation. By incorporating a monitoring and evaluation framework, the Harlequin Toad (*Atelopus*) Conservation Action Plan will advance priorities and strategies for *Atelopus* conservation, updating objectives and actions as threats and conservation successes evolve.

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## *Quercus sichourensis* and *Pinus squamata* fruit for the first time in ex situ cultivation

In July and August 2021, *Quercus sichourensis* (Fagaceae) and *Pinus squamata* (Pinaceae), respectively, planted at Kunming Botanical Garden in Yunnan province, south-west China, were found to be bearing fruits. This is the first time the two species have been recorded to fruit in the Botanical Garden since they were propagated from seeds collected from wild populations in south-east Yunnan 12 and 9 years ago.

Both species are evergreen trees with high ornamental value. The leaves of *Q. sichourensis* are thick, leathery, whitish and pilose abaxially, and the nuts are large, each with one cupule enclosing nearly all of the nut, an arrangement different from most species in the genus *Quercus*. The unique characteristics of *P. squamata* are a straight trunk with white bark, branches sweeping downwards, and five needles per bundle.

With only 17 and 34 fully grown trees known to remain in the wild, respectively, and restricted areas of occupancy, *Q. sichourensis* and *P. squamata* are categorized as Critically Endangered on the IUCN Red List and both are listed in China as Plant Species with Extremely Small Populations. *Pinus squamata* also has grade I priority protection in China's National Key Protected Wild Plants. With these various categorizations and being at risk of extinction, these two species have attracted much attention. The fruiting of the species in Kunming Botanical Garden was



The unusual fruits of *Quercus sichourensis*, with the cupule enclosing nearly all of the nut. Photo: Zhifa Chen.