

# Bountiful blooms

*The world's botanic gardens should work together to conserve plants at risk of extinction.*

“There are three things which have stimulated men throughout the ages to travel far and wide over the surface of the globe,” wrote Arthur Hill, assistant director of the Royal Botanic Gardens, Kew, in 1915. “And these are gold, spices and drugs.” (A. W. Hill *Ann. Missouri Bot. Gard.* 2, 185–240; 1915).

It was these last two, Hill went on to argue, that served as the impetus to create some of the earliest botanic gardens. Yet over the years the remit has shifted and expanded, as the medicinal and culinary repositories of old has given way to complex institutions tasked with delighting and educating the public — while providing a hub for research and conservation.

A study published this week in *Nature Plants* highlights the fruits of those efforts: a survey of 1,116 botanical collections shows that they hold representatives from about 30% of the world's plant species (R. Mounce *et al.* *Nature Plants* <http://dx.doi.org/10.1038/s41477-017-0019-3>; 2017). It is a testament to the resourcefulness of their staff that such gardens are able to foster so much diversity in the face of mounting pressures to boost revenue.

But with 20% of the world's plant diversity threatened with extinction, the study also suggests that there is room for improvement when it comes to conservation. The collections, for example, are unbalanced: 76% of the missing species are from tropical regions. Less than 5% of non-vascular genera, such as mosses, are represented at all. (And although seed banks can pick up some of the slack, certain species are still best preserved as living specimens.)

Some of this reflects bias in the data. Only about one-third of the world's botanic gardens were included in the study, and gardens with fewer resources are less likely to upload information about their collection to a database. But the data also point to a need to focus conservation efforts on neglected taxa.

Given limited resources, the best way to do this is to coordinate efforts between botanic gardens. Many zoos have long done this. The

crop research community came together in 2011 to preserve plant genetic resources that are important for agriculture. And botanical gardens around the world have embraced the Global Strategy for Plant Conservation, adopted in 2010 by the United Nations Convention on Biological Diversity. But to realize the strategy's goal of protecting at least 75% of threatened plant species in botanical collections by 2020, gardens must come together to structure and bolster their conservation efforts.

There are signs that such an approach would take off. Botanic gardens, despite the occasional outbreak of one-upmanship, have a history of collaboration that will provide fertile soil for a targeted approach to conservation. These gardens should embrace an active role in plant conservation, and should not limit themselves to educating the public about the need for it. Who else has the ability to coax the world's most finicky plants to thrive in new ground, or to force a recalcitrant seed to germinate?

A good example is a meeting planned for April 2018, when experts in rhododendron cultivation will meet botanic-garden staff from areas of the world that host endangered rhododendron species. The effort could provide an excellent test case for botanic gardens: rhododendrons are charismatic megafauna — their showy flowers are prized by gardeners around the world, which means that the public cares about their preservation. At the same time, they are particularly vulnerable to climate change, and their seeds often do not remain viable in storage, making live cultivation particularly important.

As efforts such as this take off, more botanic gardens can legitimately sell themselves to the public as protectors of the world's plants, and entice visitors to view their rare specimens. Kew Gardens executed this beautifully when it saved a tiny Rwandan water lily (*Nymphaea thermarum*) from extinction in 2009 by painstakingly working out how to germinate its seeds. The media campaign around the lily enticed crowds to come and see one of the world's few living samples. (In this case, the strategy worked perhaps too well: so great was the public's thirst for the lily that a thief made off with one in 2014.)

More botanic gardens can and should put their unique skills to work to preserve plant diversity. Many have already grown to be much more than collections of spices and drugs. With better coordination, more could yet strike gold. ■

# Catalan crisis

*The upcoming vote on independence is unsettling scientists.*

There has been a run on George Orwell's dystopian novel *1984* in this era of alternative facts. Orwell also wrote the 1938 *Homage to Catalonia*, in which he described his admiration for the region's distinct character. It, too, may be worth a reread.

The region's centuries-long struggle for independence from Spain is in acute crisis. The Catalan government in Barcelona is holding a referendum on the issue on 1 October. The central government in Madrid says the vote is illegal.

Reverberations from the chaotic stand-off can be felt even in research labs, where many scientists have told *Nature* they hold conflicting views: science would have a lot to gain from independence, but also a lot to lose.

Catalonia has upped its scientific game since the economic boom of the late 1990s. It created a handful of high-level research centres and an agency that recruits and pays the salaries of top scientists, who can choose their host Catalan institute or university. These moves,

among others, have allowed Catalonia to overtake the rest of Spain in some measures of scientific achievement. In the most recent round of European Research Council (ERC) starting grants, for example, 10 of the 22 awarded to researchers in Spain went to the region, which is home to just 15% of the Spanish population. Of those ten, most of the recipients were foreigners, testimony to the region's international attractiveness.

Many scientists believe that an independent Catalonia could change the scientific landscape even more fundamentally, not least by releasing universities from old-fashioned and inflexible national laws. Yet in the event of independence, Catalonia would automatically leave the European Union, and Spain would make sure it never got back in. That would weaken the region's research. For one thing, it would no longer be allowed to host those plentiful ERC grants.

Still, many Catalan researchers say they will vote 'yes'. Their emotions have only been fanned by Madrid's move in mid-September to block the budgets of public bodies, including research institutes and universities, in an attempt to stop financing of the referendum.

The political uncertainty is likely to escalate whatever the result. And this is damaging. The independence debate has distracted Catalan politicians from other issues, including science. Frozen budgets threaten the world-class status of the institutes that the region has so carefully built up — and that it will need, whatever political solution emerges. ■