



Everyone is talking about aliens at the moment – not little green men from Mars but those introduced invasive plants that are devastating natural habitats around the world. There was a conference in Tromsø, Norway, last July (see PLANT TALK 7, p. 14); there was a workshop on alien invaders at the IUCN World Conservation Congress in Montreal in October; and some are even predicting that aliens will be the greatest threat to wild plants in the next century.

Most botanists will know examples of plant invasions. One that struck me most forcefully was a frightening case on the beautiful island of Jamaica. A handsome shrub in the Acanthaceae with the name of *Goldfussia isophylla*, originally introduced as an ornamental in Jamaica, has invaded gullies in the Blue Mountains at 1200–1400 m to such an extent that you can see its deep bluish-purple foliage from far away. When you look closely at one of these gullies, you realize how perfectly these invaders have done their job. Over hundreds of metres, all the mosses, filmy ferns and vascular plants have been totally wiped out. I estimate it would take a troop of 100 soldiers two years to remove the native plants so effectively from one single gully.

However, botanists tend to forget just how many of these plants they have themselves introduced. One of the main entrance gates for aliens has always been and still is botanical gardens. Statistics on exotic timber species and shrubs show

Botanists to blame?

BY KLAUS AMMANN

that most of these woody species have been introduced on purpose through botanical gardens.

Nor is this process slowing down: on the contrary, it is increasing due to the mobility created by modern technology even in the last few decades. I see no indication that botanical gardens appreciate the harm which their well-intentioned activities are causing. The exchange of seeds and living plants is still merrily going on with only one restriction – the Convention on International Trade in Endangered Species (CITES). But of course few invaders are threatened species in their natural habitats and so few are listed on the CITES Appendices. Nor does CITES stop all movement of plant propagules. Exemptions include plants propagated artificially or plants moved for conservation purposes. What is frightening is that some of these plants have a lag time of 200 years before they turn invasive, as shown in studies by U. and H. Sukopp for some 3000 woody exotics over the last 300 years in Berlin.

We have to reconsider all those beloved habits and traditions that gardeners still follow, such as seed exchange and building up 'conservation collections' of a single genus. Indeed, I consider such collections of species in a single genus to be very efficient sites for the destruction of species through the hybridization that is unavoidable in the long run.

Anyhow, in botanical gardens, we should be shifting our approach to a proper combination of aiding *in situ* conservation and providing *ex situ* facilities within an integrated approach, taking into account modern insights in population genetics. If we did this, we would automatically prevent the sort of damaging introductions that can do so much harm. For example, at Bern Botanical Garden, we have a project to restore the only wild population of *Viola elatior* in

Switzerland. Before we start propagating plants from the wild source in the garden, we shall remove all the other *Viola elatior* populations that we have, so as to wipe out all possibilities of unwelcome hybridization with plants of unknown origin. As a result we will be sure that the plants we propagate and reintroduce are guaranteed to be of the right origin.

If we want to succeed in plant conservation, we have to be far more careful about those introductions that we make. We must accept that each plant we grow outdoors in a botanical garden is in effect a field release and is a test as risky as those we do with transgenic plants or GMOs (crops or ornamentals with genes introduced by genetic engineering methods).

I believe that we should introduce a scheme of long-term observation and quarantine for each introduction. This way we can at least prevent introductions under our control that could be harmful. And how can we convince governments of the need to act if we ourselves are part of the problem? We should also stop perpetuating the mentality that people managing botanical gardens are somehow above these problems and that exceptions should be made for them.

Once an introduction has taken hold, as in Jamaica, it is almost impossible to reverse. For some key plant areas, it is now too late. But for others major damage can still be prevented. We need a new international legal agreement to control potentially damaging introductions and eradicate those that can be removed. Even more important, we need much increased public awareness of the problem and the dangers. But first we botanists have to put our own house in order.

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