

The Potential for Chilean Plants in Cultivation®

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INTRODUCTION

There is little doubt that the introduction of Chilean native plants has made an enormous contribution to British and Irish amenity horticulture. Although the collectors responsible for these introductions are well documented, the precise locations from where they made many of their collections, are very sketchy. The vast majority of plants were introduced during the early to mid part of the 19th century by William Lobb and Richard Pearce, who were employees of the celebrated nursery firm, Veitch and Sons. In the 1920s there was a revival of interest in Chilean plants when Harold Comber and Clarence Elliott made further notable introductions. Much of their collecting was carried out in the Valdivian Rainforests of southern central Chile and in the case of Harold Comber, the neighbouring forested and alpine regions of Argentina. The legacy left by these dedicated collectors has meant that gardeners throughout the world have been left with a rich and diverse range of Chilean plants to grow, estimated to total almost 800 taxa (Maxwell and Gardner 1997). This figure includes the many hybrids and named cultivars that have been bred using introduced wild species from such genera as *Alstroemeria*, *Berberis*, *Escallonia*, and *Gaultheria*. For various reasons some Chilean plants have not been used to their full horticultural potential and/or are not widely available in the commercial trade. There needs to be a re-evaluation of how plants should be selected and propagated. Some new species and selections have been introduced through the International Conifer Conservation Programme (ICCP) based at the Royal Botanic Garden Edinburgh. The ICCP is exploring ways in which these plants can be released into the commercial domain but at the same time working within the spirit of Article 15 of the Convention on Biological Diversity (CBD), which promotes the fair and equitable sharing of benefits of genetic resources.

COMMONLY CULTIVATED CHILEAN PLANTS

Some of our most commonly cultivated garden plants are Chilean, of which *Berberis darwinii* is a prime example. There are numerous other Chilean species that have also gained popularity and these include, *Alstroemeria aurea* (syn. *A. aurantiaca*), *Araucaria araucana*, *Buddleja globosa*, *Embothrium coccineum*, *Escallonia rubra* var. *macrantha*, *Fuchsia magellanica*, *Gaultheria mucronata* (syn. *Pernettya mucronata*), *Solanum crispum*, and the scores of named hybrids derived from the wild species of *Berberis* and *Escallonia*. Many other species also thrive on the western seaboard of Britain and Ireland, where the climate tends to be milder in the winter months and the annual rainfall is relatively high. Such species include *Corynabutilon vitifolium* (syn. *Abutilon vitifolium*), *Desfontainia spinosa*, *Drimys winteri*, *Luma apiculata*, *Podocarpus salignus*, and *Tropaeolum speciosum*, to mention just a few. One reason why many Chilean plants are relatively widely cultivated is that they are all readily propagated by either vegetative or sexual means. Some species, such as *Berberis darwinii*, are so well suited to the climates of Britain and Ireland, that they freely produce viable seed and in places have become naturalised.

CHILEAN PLANTS WITH UNTAPPED POTENTIAL

There are a number of very attractive Chilean plant species that have a long history of cultivation in Britain and Ireland but for various reasons they are limited to botanic gardens, national arboreta or specialist collections (see list below). Such plants include *Berberis valdiviana*, which was first introduced to cultivation in 1902 and later by Clarence Elliott in the 1930s (Bean, 1976). To my knowledge, the only known wild origin plants in cultivation were introduced in 1990 and again in 1993 by Gardner and Knees (under the collecting numbers GAK 4675 and 5606 respectively). It is a very handsome evergreen shrub to about 5 m tall with large glossy green leaves and hanging racemes of saffron-yellow flowers in May. The reason for its scarcity in cultivation is because it is difficult to propagate, coupled with the wrong assumption that it is not particularly winter-hardy. There is little doubt that with the appropriate propagation trials it will be possible to make this very attractive species more widely commercially available.

Other examples include *Campsidium valdivianum*, which has an even longer history of cultivation (introduced by William Lobb sometime between 1840 and 1857 which flowered for the first time in April 1874 (Veitch, 1906) but due to its indifferent performance as a flowering climber it again has remained isolated to a few specialist collections. Little is known about its cultural requirements but in the wild it is one of the most vigorous climbers in the Valdivian Rainforests, occurring at relatively high altitudes of up to 900 m. In the wild it flowers throughout the winter months but is perhaps at its best in late winter and early spring when it is one of the very few forest plants in flower. Its stunning fuchsia-pink flowers are produced in profusion and in late winter and early spring the fallen corollas litter the forest floor. More introductions from the wild need to be made and trials need to be undertaken to understand more about its cultivation and propagation requirements.

Of the nine Chilean *Nothofagus* species, *N. nitida* is undoubtedly the most attractive, yet it is rarely cultivated due to the difficulty in obtaining viable seed. Unlike the previous two examples this evergreen tree, which has the most attractive young bronze-coloured foliage in early spring, may prove to be somewhat winter-tender in some of the colder regions of Britain and Ireland. It is a tree to 60 m in the wild with diamond-shaped, deep glossy green leaves. Propagation experiments are currently under way at Royal Botanical Garden (RBG) Edinburgh using late summer semi-ripe cuttings.

Other plants that are already in cultivation but worthy of wider cultivation include: *Berberis ilicifolia*, *Blepharocalyx cruckshanksii*, *Caldcluvia paniculata*, *Drimys winteri* var. *andina*, *Gaultheria tenuifolia*, *Maytenus magellanica*, *Senecio candidans*, and *Wendtia gracilis*.

THE IMPORTANCE OF CLONAL ORIGIN AND SELECTION

In some cases horticulturists have not fully exploited Chilean plants already in cultivation. Poor forms are sometimes cloned, largely because there is only a single clone in cultivation making seed propagation impossible because of self-incompatibility. One good example of this is the evergreen climber *Ercilla volubilis* (Phytolacaceae) which is limited to specialist collections. I have vivid memories of seeing plants growing through a tree of *Maytenus boaria* on the coast of southern Chile. It had hundreds of clusters of bright orange-red fruits, something that I have not seen on cultivated plants. A group of three plants raised at RBG Edinburgh from the

seed of these wild plants have produced flowering forms ranging from almost white to pale pink and clusters of fruits similar to those encountered in the wild. There are several possible explanations why these particular plants have produced fruit in cultivation. Even though this species is monoecious it is possible that it is self incompatible and therefore requires other genotypes to out-pollinate with in order to produce the colourful fruits described here. Another possible explanation is that the clones traditionally cultivated are sexually disfunctional.

There are clones of *Hydrangea serratifolia* which really do not do justice to this beautiful flowering climber. The frequently cultivated female clone has extraordinarily dull flowers compared with those clones with male flowers. The latter has inflorescences up to 15 cm × 9 cm composed of masses of creamy white exerted stamens. To my knowledge there are no named clones of this climber, therefore, it would be beneficial to the horticultural industry if it gives the male form a cultivar name.

NEW GARDEN PLANTS FROM THE FORESTS OF CHILE

Even though many of the horticulturally worthy Chilean plant species are now in cultivation some have slipped through the net (see list below). The reasons for this are various, including the difficulty of visiting remote areas where some narrow endemics occur. Species such as those belonging to the Myrtaceae produce ripe fruits sporadically, sometimes during the winter which is a time of the year when overseas plant collectors rarely visit Chile. The fleshy-fruited members of this family have also proved to be difficult to transport in a viable state. Since 1996 the International Conifer Conservation Programme has been working with colleagues at the RBG Edinburgh to develop the Chilean rainforest project at RBG Edinburgh's Benmore Botanic Garden on the west coast of Scotland. This project aims to represent all elements of a typical Valdivian Rainforest focusing particularly on establishing viable populations of threatened species.

In working towards this goal many new plants have been introduced and most are now growing happily on site. Of these it is worth making a particular mention of *Latua pubiflora*. It was first introduced to cultivation in 1859 by the Veitch collector Richard Pearce but there is little reference to its cultivation and it is presumed that Pearce's introduction died out in the early part of the 1900s (Gardner and Knees, 2000). A recent introduction by the ICCP is proving to be of great garden merit especially as it adds to the limited number of winter-flowering shrubs that are in cultivation. This semi-evergreen, winter-hardy shrub has urn-shaped flowers, reminiscent of those of the Chilean climber *Sarmienta repens*, and these are produced from January to late March. On plants 3 m tall one can expect see up to 300 magenta flowers, each up to 4 × 1.5 cm. It is easily propagated at any time of the growing season by soft tip cuttings, and plants will start to flower within a period of 4 years.

Besides newly introduced species there are also several new forms of well established cultivated plants. For example, there are several flower colour forms of *Desfontainia spinosa* and a form with a very slender corolla. Others include the yellow-flowering form of *Embothrium coccineum*, blue-foliage forms of *Fitzroya cupressoides* and there are still very good wild forms of *Berberis darwinii* which would be worth introducing to cultivation.

Chilean Plants Newly Introduced to Cultivation.

***Amomyrtus meli* (Myrtaceae).** An elegant large tree up to 20 m tall, with smooth whitish trunks. The leaves are strongly aromatic and the flowers are creamy white. It thrives in poorly drained soils and has so far proved to be a little less winter hardy than the cultivated Chilean species *A. luma* (syn. *Myrtus lechleriana*).

***Anemone hepaticifolia*.** Perennial with a thick rhizomatous stock. Leaves up to 17 × 19 cm, marbled white (reminiscent of *Cyclamen hederifolium*). Flowers borne on 40-cm-long stalks, petals white (or sometimes lilac-blue), anthers rosy pink. Native of mountainous coastal forests in deep shade.

***Cortaderia araucana*.** A pampas grass to 2.5 m tall. The male plants have plumes of pale creamy pink, up to 1m long

***Elytropus chilensis*.** Early spring-flowering, evergreen climber with saucer-shaped, cream flowers often with deep pinkish-red veins. Flowers persist for up to 6 weeks.

***Latua pubiflora*.** Semi-evergreen, winter-hardy shrub to 4 m. Flowers borne on the main stems, urn-shaped, magenta, 4 × 1.5 cm. Flowers late January to early April.

***Legrandia concinna* (Myrtaceae).** Small tree to 8m tall. Leaves 5 cm × 3cm, brilliant reddish brown when young. Flowers up to 2 cm across, petals white. One of the rarest species of Chilean myrtles which may prove to be slightly frost-tender in cultivation.

***Myrceugenia lanceolata* (Myrtaceae).** An elegant myrtle to 2.5 m tall with lanceolate leaves which are dark grey-green above, yellow-green beneath. Flowers white, each consisting of 100-200 exerted stamens, fruits yellow.

***Myrceugenia chrysoarpa* (Myrtaceae).** Shrub to 3 m tall, with creamy white flowers composed of many exerted stamens. Fruits orange. Said to be the most cold-tolerant species of Myrtaceae in Chile (Landrum, 1988) and certainly this has proved to be the case so far in cultivation.

***Poa borchersii*.** A compact, tussock-forming grass with coarse leaves to 80 cm long and with plumes of creamy brown flowers to 1 m long.

***Ugni candollei* (Myrtaceae).** A shrub to about 2 m tall. Its flowers are broadly saucer-shaped, 1 × 1 cm, white and flushed pink with age. In the wild this species is often associated with *Fitzroya cupressoides* and occurs at some of the highest elevations (900m) in the Coastal Cordillera, therefore, it should prove very winter hardy.

THE CONSERVATION OF CULTIVATED WILD PLANTS

Many cultivated Chilean plants are threatened in the wild. In fact 329 of the 5284 species of plants (6.2%) native to Chile are threatened with extinction (Walter and Gillett, 1998). During a period of 3 days in December 2001, 30,000 ha of native Chilean rainforest was destroyed by fire much of these Andean forests contained *Araucaria* trees.

For many years the ICCP has been working with U.K. and Chilean institutions to help develop research programmes to promote biodiversity conservation. One aim of the most recent project, in collaboration with the Universidad Austral de Chile

Table 1. Chilean plants cultivated out of doors in Britain and Ireland and listed by IUCN as being of Conservation Concern.

Species	Threat category	Species	Threat category
<i>Araucaria araucana</i>	VU	<i>Myrceugenia leptospermoides</i>	VU
<i>Austrocedrus chilensis</i>	VU	<i>Nothofagus alessandrii</i>	EN
<i>Berberidopsis corallina</i>	EN	<i>Nothofagus glauca</i>	VU
<i>Citronella mucronata</i>	R	<i>Nothofagus xleonii</i>	EN
<i>Corynabutilon ochsenii</i>	R	<i>Pilgerodendron uviferum</i>	VU
<i>Eucryphia glutinosa</i>	LR/nt	<i>Pitavia punctata</i>	EN
<i>Eucryphia cordifolia</i>	LR/nt	<i>Podocarpus nubigenus</i>	LR/nt
<i>Fitzroya cupressoides</i>	EN	<i>Podocarpus salignus</i>	VU
<i>Gomortega keule</i>	EN	<i>Prumnopitys andina</i>	VU
<i>Jubaea chilensis</i>	VU	<i>Puya venusta</i>	VU
<i>Laurelia sempervirens</i>	LR/nt	<i>Saxegothaea conspicua</i>	LR/nt
<i>Legrandia concinna</i>	R	<i>Satureja multiflora</i>	R
<i>Lobelia bridgesii</i>	R	<i>Valdivia gayana</i>	EN

Taxa with the new (post 1994) IUCN categories of EN — Endangered, VU — Vulnerable, LR/nt — Low Risk: near threatened, have been taken from Oldfield et al. (1998) and those with R — Rare have been taken from Walter and Gillett (1998).

Valdivia, is aimed at working with the horticultural industry to commercialise new Chilean plant introductions and direct a proportion of the profits derived from their sale to benefit long-term conservation projects in Chile. The project is working with local landowners in Chile to protect priority sites that contain threatened narrow endemics and it is hoped that these will be sites that eventually will directly benefit from the sale of Chilean plants in the U.K. The project, entitled "An integrated conservation programme for threatened endemic forest species in Chile" is being funded by the Darwin Initiative for the Survival of Species, which is administered by the Department for Environment, Food and Rural Affairs. The commercialisation of Chilean germplasm will of course strictly follow the international law of CBD part of which is concerned with the fair and equitable sharing of the benefits of genetic resources.

When the pioneer plant collectors William Lobb, Harold Comber and their contemporaries made their collections there were still extensive tracts of rainforests in the Andean and coastal cordilleras of Chile. As with so many parts of the world this situation has greatly changed and many of these forests have become fragmented due to deforestation and some species are now threatened (see Table 1). Although few in number, there are still new garden-worthy plants to be added to the extraordinary range that already exists in cultivation. Even though present international laws have restricted the introduction of new garden plants from the wild it is hoped that the Darwin Initiative project will help to establish new ground in which novel plants can be marketed and at the same time directly benefit in-situ conservation activities. The horticultural industry can play an important role and make a real contribution to conservation of Chilean plants in the wild.

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