

INTRODUCTION

Over the last 200 years or so, nearly as many alien plants have been recorded in Ireland as there are native taxa. Although many were and are only of temporary occurrence, others such as Sycamore and Montbretia are characteristic plants in the Irish landscape. Alien plants now form an important part of the country's biological diversity. This Catalogue is the first annotated check-list of the approximately 920 alien plant taxa recorded in Ireland, past and present. The majority are flowering plants. Catalogue entries include comments on frequency of plants, whether they are established or not, habitats where found, possible means of introduction, historical records and vice-county distribution. Details of records and supporting references are given in many cases, allowing the reader to see where generalizations have come from. The Appendix includes a further 48 taxa excluded from the main work. Based on the Catalogue entries, a brief historical overview and description of the current alien flora (some 645 taxa recorded between 1987 and 2001) follow this introduction.

The main sources of information are published and herbarium records, personal field work and personal communications. For a broader context and much additional information, the Catalogue should be used in conjunction with *Alien plants of the British Isles* (Clement & Foster 1994) and *Alien grasses of the British Isles* (Ryves *et al.* 1996). Those works include, for example, countries of origin, sources of introduction into the British Isles and references to plant descriptions and illustrations. To complement distribution information given in Catalogue entries, the maps in the Botanical Society of the British Isles *New atlas of the British and Irish flora* (Preston *et al.* 2002) should be consulted.

Historical records

For the purposes of this work, the earliest reference usually cited is Moore and More's (1866) *Contributions towards a Cybele Hibernica*, which was based on Watson's (1847-59) *Cybele Britannica*. *Cybele Hibernica* outlined the geographical distribution of plants in Ireland and summarized earlier work. Many plants now considered alien were included, for example, garden escapes and relics of cultivation, arable weeds and casuals introduced with agricultural seed, as well as others which were only known as planted or "not thoroughly established beyond the influence of man". Thirty-two years later, Colgan and Scully (1898) produced the second edition of *Cybele Hibernica*. According to Praeger (1901a), the authors did an immense amount of critical sifting, getting rid of errors and settling innumerable doubtful points since the first edition. The authors also made considered statements about individual species and changed the status of some, for example, from 'possibly

introduced' in the first edition to 'certainly introduced' in the second. Alien plants considered established were included in the main body of the work, but a new feature was the relegation to an appendix of all the "Errors, casuals, and aliens not fully naturalized".

Towards the end of the 19th century and in the early 20th century, considerable botanical activity resulted in Floras for Cork (Allin 1883), Howth (Hart 1887), the north-east (Stewart & Corry 1888), Donegal (Hart 1898), Dublin (Colgan 1904b), the west (Praeger 1909a) and Kerry (Scully 1916). These all contained information about alien plants. In addition, the *Irish Naturalist* was founded in 1892, and its monthly appearance encouraged the publication of even quite casual observations. In retrospect, such observations and records have greatly helped build up the long-term picture.

In 1895, Robert Lloyd Praeger realized that there was a need for an Irish 'Topographical Botany' giving county distribution of plants, a companion work to *Cybele Hibernica*. Because of the varying sizes of the counties, the larger ones were divided, resulting in 40 vice-county divisions. Following five years of intensive field work and gathering together all available 'modern' records, *Irish topographical botany* was published in 1901, and it has formed the basis for subsequent vice-county recording. Unlike earlier works, many casuals and alien plants naturalized in only one locality were omitted because Praeger considered that their claim to admission to the flora may have depended only on local and temporary influences.

Around the turn of the century, several botanists became interested in the exotic plants found near docks, or which appeared near flour mills, distilleries and hen runs, introduced with foreign grain (e.g. Praeger 1893g, 1900c, Stewart & Praeger 1894-95, Scully 1895b, Knowles 1903, 1906). Not only were records usually published but, more importantly, voucher specimens were often collected, and this has allowed the records to be confirmed or amended. Knowles (1906) especially encouraged the reporting of "these foreigners" because they might become more or less permanent members of the flora, and it seemed desirable to record the date of their arrival, as well as the manner in which they were introduced and the sources whence they had come. Referring to her paper, Praeger (1908) wrote that alien immigrants "deserve more attention than they have hitherto received", and in the first number of the *Irish Naturalists' Journal* in 1925, the editors included among subjects which called for treatment from time to time "the hordes of immigrant alien plants which are continually landed on our shores".

20th century records

Records of alien plants continued to be published throughout the 20th century, in journals as well as in regional Floras for the north-east (Praeger & Megaw 1938, Hackney 1992), Wicklow (Brunker 1950), Carlow (Booth 1979), Connemara and the Burren (Webb & Scannell 1983), the Lough Neagh area (Harron 1986), a group of islands in West Cork (Akeroyd 1996), Dublin (Doogue *et al.* 1998) and Cavan (Reilly 2001). At a more local level, annotated lists were made for Dublin Port by H.J. Hudson in the mid-1930s (Reynolds & Nash 2001) and for the Guinness Brewery in Dublin (Brunker 1944b). Towards the end of the century, urban floras of Dublin (Wyse Jackson & Sheehy Skeffington 1984) and Belfast (Beesley & Wilde 1997) were published. In addition, three all-Ireland recording schemes were organized by the Botanical Society of the British Isles. Field work for the first was undertaken in the 1950s (Perring & Walters 1962), and most recently the results of the 1987-88 Monitoring Scheme (Rich & Woodruff 1990, Rich *et al.* 2001) were incorporated in the distribution maps for the *New atlas of the British and Irish flora* (Preston *et al.* 2002) for which field work was completed in 1999.

Many alien plants occur only as casuals, exciting little general interest, and the history of many others is often not well known. However, some aliens took the fancy of botanists and their spread was well documented; see, for example, *Matricaria discoidea* which was first noted in Co. Dublin in 1894. The progress was also followed of other less common plants such as *Sarracenia purpurea* which had been deliberately introduced onto various midland bogs and *Artemisia stelleriana*, an obvious garden escape. The latter was monitored over 25 years at its only sand dune site which was eventually washed away. In contrast, the spread of the very conspicuous *Rhododendron ponticum* went virtually unreported until the mid-20th century. Webb and Scannell (1983) suggested that until then it had not been considered a 'respectable' alien, and so was not chronicled with the loving care shown to the Wallflower and Cornflower.

Taxa included in the Catalogue

What is considered an alien plant? In the first edition of *Cybele Hibernica*, Moore and More (1866) made decisions about the status of each taxon they included, using symbols for 'possibly introduced', 'probably introduced' and 'certainly introduced'. These categories have continued to be used to the present day when plant records are published. The whole issue of plant status was addressed by Adams (1909c) and again, in more depth, by Webb (1985). They both laid down a number of criteria which needed to be considered before a decision about native or any other status was made. Webb (1985)

defined an alien plant as one which reached the British Isles as a consequence of the activities of neolithic or post-neolithic man or of his domestic animals. Because it is impossible to know whether some plants were weeds of neolithic crops or not, arbitrary decisions were made about their status. After the middle of the 16th century and influx of plants brought back from voyages of discovery, it was easier to trace the introductions. Clement & Foster (1994) and Ryves *et al.* (1996) define 'alien' in the British Isles in a broad sense, to denote "all plants, whether established or not, that are thought to have arrived as a result of human activities". However, following the tradition of British floras, species probably introduced in ancient times with the advent of cultivation are treated by them as though native. By contrast, in Ireland many arable weeds are considered alien plants.

With changing and increased knowledge since the 19th century, there has been considerable re-evaluation of plant status. Using the same status categories first laid down by Moore and More (1866) in *Cybele Hibernica*, Praeger (1934b) summarized the vice-county distribution of the Irish flora in a Census List in *The botanist in Ireland*. It is this Census List which formed the basis for Scannell and Synnott's (1972) *Census catalogue of the flora of Ireland*, with an updated second edition in 1987. However, the status of many taxa in the latest edition of *An Irish flora* (Webb *et al.* 1996) differs from those given in earlier editions and from those in the second edition of the *Census catalogue*. Most recently, the status of taxa in the British Isles as a whole has been reassessed for the *New atlas of the British and Irish flora* (Preston *et al.* 2002).

In the early stages of the present work, a pragmatic decision was made to include: (1) all the taxa marked 'certainly introduced' in the second edition of the *Census catalogue* (Scannell & Synnott 1987); (2) definite introductions not listed in the *Census catalogue*, but which were found growing in the wild, or which were relics of cultivation; (3) a small number of taxa considered alien in the British Isles (Clement & Foster 1994) but not so in Ireland; and (4) cultivated alien taxa recorded in gardens, parks, plantations etc. which have often become well naturalized in such situations, but not obviously spreading elsewhere. Also included are (5) taxa marked 'probably introduced' in the *Census catalogue*, and (6) alien taxa for which there are erroneous, unreliable or unconfirmed published records.

Although it is usually known whether a cultivated species was originally introduced or not, the status of others, such as some arable weeds and casuals, is less clear. For this reason, taxa considered 'probably introduced' are included. It also allows comparison between related species, for example, *Fumaria bastardii* and *Melilotus officinalis* are considered certain

introductions in the *Census catalogue*, while *F. officinalis* and *M. altissimus* are only probable introductions. Another such group are those whose status is still being debated, for example, *Ceratophyllum submersum*, *Erica ciliaris*, *Luronium natans* and *Poa infirma*.

Alien variants of native species may be accidentally or deliberately introduced in agricultural and other seed mixtures, or accidentally introduced with imported grain and animal feed. However, because there was insufficient information about their origins, there are only a few entries for this group in the Catalogue. Not included are species such as *Trifolium repens* and *Lolium perenne* used for reseeding pastures and road verges, *T. micranthum* probably introduced with grass seed, and *Capsella bursa-pastoris* probably introduced with animal feed.

The Appendix contains a disparate assortment of species which do not belong in the main Catalogue. Most are native species which are also grown in gardens, sometimes from foreign seeds or plants, and which have then escaped into the wild. Included too are a few species marked 'possibly introduced' in the *Census catalogue* which may be relics of ancient cultivation.

Catalogue entries

Many of the plants listed in the *Census catalogue* (Scannell & Synnott 1987) as 'certainly introduced' are now considered part of the established flora, and the sources for that work have already been published (Scannell & Synnott 1989, 1990). In this Catalogue, only additional vice-county records are given for the common taxa, but more details are given for taxa which are considered rare or declining. For alien taxa not listed in the *Census catalogue*, all records are usually given because information has not previously been compiled for them. The date classes post-1970 and post-1987 used in the Catalogue were chosen to correspond broadly with those used in *New atlas of the British and Irish flora* (Preston *et al.* 2002). However, they differ in that post-1970 here means all records between 1970 and 2001, and post-1987 means 1987 to 2001. Also, all post-1987 records were made since publication of the *Census catalogue*.

In Catalogue entries, the emphasis is on the current standing of the plants. Depending on the details available from primary sources, entries include comments on frequency, whether the taxon is casual, merely persisting or established, habitats, possible means of introduction, first or early records, history and vice-county distribution. In many cases, detailed vice-county records are also given. Species protected or prohibited by law are indicated. The format of the entries is described more fully in the Explanatory Notes

and that section also contains information on nomenclature and vice-counties as well as explaining the abbreviations used.

Most alien plant records are for those found in the wild. These may show evidence of either having arrived there by themselves or originating from discards, or which have spread vegetatively or by seed from where they were planted. However, there are also many records of plants in demesnes, large parks, near ruins and on roadsides where it is often not easy to delimit where the managed area ends and the wild begins. For example, in relation to trees, Webb (1979) only regarded them as naturalized if there were self-sown saplings of a reasonable size found among mainly native vegetation and in a community less subject to management than a park or demesne wood. Such criteria are not always strictly adhered to, and the lack of definite information for some plants is reflected in the Catalogue entries.

Sources of information

Over 850 published works were consulted and they are listed in the References and Bibliography. Apart from the major books and Floras mentioned above, the majority of the records were published in the *Irish Naturalist* (1892-1924) and the *Irish Naturalists' Journal* (since 1925) as well as in various publications of the Botanical Society of the British Isles, including *Watsonia* (since 1949) and *BSBI News* (since 1972). Some published records have been re-evaluated. Because the emphasis in the Catalogue is on distribution, fewer references dealing with the ecology or biology of a species are given.

Records were extracted from specimens in the three main Irish herbaria: at the National Botanic Gardens and Trinity College, Dublin (**DBN** and **TCD**, mainly in 1994), and at the Ulster Museum, Belfast (**BEL**, mainly in 1996). An important feature of the Catalogue is that many of the herbarium specimens cited, particularly those in **DBN**, have been checked and some redetermined. As acknowledged elsewhere, much of that work was done by Botanical Society of the British Isles referees and specialists. Many of the specimens are vouchers for published records, so Catalogue entries can be consulted for confirmation or amendment of those records. For example, three records of alien plants in a Dublin gravel pit (Praeger 1894a) were redetermined as were several on lists of grain aliens given in Stewart & Praeger (1894-95) and Knowles (1906). While many problems were resolved, such as the identity of old *Aster* specimens in **DBN**, there remain other groups which still need critical determination, such as *Amsinckia* and *Spiraea*.

A source of recent records was my own field work carried out since 1988, specifically looking for alien plants. Personal communications are also included, and I am grateful to the many botanists who passed on unpublished records. In particular, Ian McNeill and Paul Green provided extensive, detailed and reliable lists, mainly for Counties Tyrone and Waterford respectively. Their interest in recording garden escapes complemented my interest in casuals at ports and on roadsides. Also, since one of the aims of the Catalogue was to provide as complete a current list of alien plants as possible, records made in 2000-01, after field work for the *New atlas of the British and Irish flora* was complete, have been included. This *New atlas* undoubtedly contains many additional map records.

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Such a Catalogue as this is not a definitive work, rather a contribution to an ongoing story. Inevitably there are errors and omissions, for which I take full responsibility. However, it is hoped that other botanists will be stimulated by the Catalogue to examine their own records of Irish alien plants and provide new or more complete information.