Necessary background for studies in the taxonomy of *Onopordum* in Australia

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Summary

In the absence of a recent and informed world revision of *Onopordum* it is very difficult to ascertain just which taxa occur thoroughly naturalized or as casuals in Australia. Three species, *O. acaulon* L., *O. acanthium* L., and *O. illyricum* L., are commonly listed as widespread and hybrids between the two latter have been suggested. In Flora Europaea, various subspecies of these three species have been included. In the Flora of New South Wales, occurrences of *O. acanthium* are restricted to *O. acanthium* ssp. *acanthium* and of *O. illyricum* to *O. illyricum* ssp. *illyricum*. *O. tauricum* Willd., *O. leptolepis* DC. and what I consider to be *O. arabicum* L. (usually known as *O. nervosum* Boiss.) have been found or may possibly occur as casuals in Victoria. In this paper, attention is given especially to difficulties in the typification of *O. illyricum* L. Doubts are expressed as to the validity of using *O. illyricum* for some of the plants so called in Australia and evidence is given suggesting that other taxa not yet recorded here may be involved. Material is also presented relevant to the origins, cultivation and naturalization of the genus.

Introduction

Of the thistles in the tribe Cynareae naturalized in Australia, the taxonomy of *Onopordum* as it occurs in south-eastern Australia is the most complex, particularly as it relates to plants called *O. illyricum* L. (Illyrian thistle) and to plants showing affinities with *O. illyricum* and *O. acanthium* L. (Scotch thistle). These latter are referred to as 'perhaps hybrids' by Michael (1968) and 'this intermediate taxon' by Groves *et al.* (1990). Parsons and Cuthbertson (1992) refer to the existence of 'a complex' consisting of Scotch and Illyrian thistles and their 'intermediates' in New South Wales. This paper is an attempt to place these thistles in proper taxonomic perspective.

Origins and cultivation

The genus *Onopordum* shows greatest diversity in south-western Asia and the Aegean region, extending west in countries to the north (Europe) and south of the Mediterranean Sea (North Africa) as far as the Canary Islands, further north in European Russia and east as far as Pakistan and Kashmir, Mongolia and north-western China. *O. acanthium,* the type of the genus and the most widespread species in Europe and Asia, originated in south-west Asia and is now a plant of disturbed sites, often rather uncommon, almost throughout the whole area specified.

There appear to be some 50 species, but there has been no recent world revision, the last attempt being made by Rouy (1896) who included 24 species with a number of infra-specific taxa of varying and often questionable status. Dress (1966) in his treatment of cultivated species indicated the need for such a revision and Danin (1975) has noted that the genus has been poorly collected. In my examination of regional accounts published since 1920 (Academia Sinica 1987, Arènes 1941, Danin 1975, Eig 1942, El-Karemy and Zahreh 1991, Feinbrun-Dothan 1977, 1978, Franco 1976, Hossain and Aziz-Al-Sarraf 1982, Meikle 1985, Mouterde 1983, 1984, Murbeck 1921, Pérez de Paz 1981, Pignatti 1982, Polunin and Stainton 1984, Rechinger 1979, Sierra *et al* 1992, Sventenius 1960, Tamamshian 1963 and Valdes *et al.* 1987) the need for clarification of some species and their relationships has become acutely obvious.

The intentional use of *Onopordum* as the heraldic or Scotch thistle has undoubtedly led to its inclusion in gardening publications and catalogues. An examination of such publications (Anonymous 1825, Anonymous 1857, Bailey 1901, 1916, 1947, Bailey and Bailey 1941, 1976, Donn 1845, Francis 1859, Fraser and Hemsley 1917, Hellyer 1952, Huxley 1992, Johnson 1852, Loudon 1872, and Stuart and Co. of London and Nice 1911) shows that seventeen species under the names given in Table 1 have been cultivated and indeed some still are.

Occurrence outside Eurasia and North Africa

All species names so far recorded in Australian floras (Willis 1972, Jessop and Toelken 1986, Harden 1992) are included in this list, namely *O. acanthium, O. acaulon, O. illyricum, O. leptolepis* and *O. tauricum,* to which may be added *O. arabicum* collected in central Victoria in 1962. The three latter

Table 1. *Onopordum* species listed with appropriate synonyms and areas of origin. Dates of introduction into the horticultural world are given after some of the names according to Fraser and Hemsley (1917).

Onopordum spp.	Date	Area of origin
O. acanthium L., including var. *alba* Hort. and the cultivar Robert Bruce		South-western Asia
O. acaulon L. (syn. *O. pyrenaicum* DC., *O. uniflorum* Cav.)	1739	South-western France and Spain, north-west Africa
O. alexandrinum Boiss.		Egypt
O. algeriense (Munby) Pomel		Algeria
O. anatolicum (Boiss.) Eig		North-western Turkey and Anatolia
O. arabicum L., sometimes as *O. nervosum* Boiss. which I consider to be a synonym.	1686	Southern and central Iberian Peninsula
O. armenum Grossh.		Armenia, Anatolia, Caucasus, Iran
O. bracteatum Boiss. and Heldr. (syn. *O. insigne* Holmboe)	1901	Southern Balkan Peninsula and Aegean region
O. caulescens D'Urv. (syn. *O. sibthorpianum* Boiss.)		Aegean region
O. heteracanthum C.A. Mey.		Iraq, Iran, Caucasus
O. illyricum (syn. *O. graecum* Gouan, according to Rouy (1896), *O. elongatum* Lam., a superfluous name)	1640	Southern Europe
O. leptolepis DC.		Iraq, Iran, Caucasus, Afghanistan, Pakistan, central Asia, north-west China
O. macracanthum Schousboe	1798	Iberian Peninsula and north-west Africa
O. murbeckii H. Lindberg		Morocco
O. polycephalum Boiss.	1904	Turkey
O. salteri Hort.	1909	Unknown
O. tauricum Willd. (syn. *O. elatum* Sm., *O.virens* DC., *O. viscosum* Schrad.)	1816	South-eastern Europe and south-western Asia

species may still occur as casuals in Victoria.

The three species *O. acanthium*, *O. illyricum* and *O. tauricum* have also been recorded from disturbed sites in California (Hickman 1993). *O. acanthium* is sparingly naturalized over much of the United States and southern Canada (Gleason and Cronquist 1991) and is one of two species recorded for Argentina (Cabrera 1971) the other being *O. arabicum* (Hauman 1928). *O. acanthium* also occurs in Chile (Matthei and Marticorena 1990) and New Zealand where *O. tauricum* has been collected only once (Webb *et al.* 1988). For brief information on the history of *Onopordum* in Australia, accounts are given under *O. acanthium*, *O. illyricum* and *O. acaulon* in Parsons (1973), Parsons and Cuthbertson (1992) and Kloot (1986).

Taxonomy of the most common species.

Occurrences of *O. acanthium* in Australia according to Jessop and Toelken (1986) and Harden (1992) are of *O. acanthium* spp. *acanthium*, but no one has yet examined a wide range of specimens from Australia to see if other infraspecific taxa are involved. Similarly *O. acaulon*, whose occurrences cover the widest distance in Australia, from Western Australia to the New England region of New South Wales, has not yet been examined in detail to see whether subspecies recorded for Europe are also here.

As indicated in the introduction, the main problem concerns *O. acanthium* and *O. illyricum* and forms having affinities with either or both of these species. The use of *O. acanthium* in the floras or treatments already referred to offers few difficulties in interpretation. There are many good illustrations of it in the literature—for example Parsons and Cuthbertson (1992), Cabrera (1971), Jessop and Toelken (1986), Rechinger (1979) and Polunin (1969). It is the species best known in Europe and has been typified by Danin (1975).

With *O. illyricum*, however, there are difficulties which must be resolved in order to understand the plants occurring so abundantly in southern New South Wales. Following the advice of W.T. Stearn, Danin (1975) chose as lectotype the illustration in L'Obel (1581) referred to by Linnaeus (1753), presumably because he could find no satisfactory herbarium specimen to meet the criteria demanded. I have not seen the particular illustration but have seen an earlier one in L'Obel (1576) which is identical with that in Dodoens (1616). There is also a similar illustration in Bauhin (1651), published posthumously. Bauhin (1651) describes how the seed of the plant was procured in Slavonia by Valérand Dourez, and grown in Bauhin's garden in Lyon in France where L'Obel first saw it. There is a later and similar illustration of the plant in Morison (1699).

I believe that all these reproductions clearly represent the same taxon and give a good idea of what the plant in a number of Linnaeus' citations actually looked like. Many plants in southern Australia and in Europe with heads with broad phyllaries, 5 mm or more at their widest part and sharply reflexed and which are called *O. illyricum* today—for example, those illustrated in Parsons and Cuthbertson (1992) and Polunin (1969)—belie this typification.

Accordingly, I believe that these plants with such phyllaries cannot legitimately be called *O. illyricum* L. This does not mean, however, that the name must be abandoned in New South Wales for it seems to be appropriate to use it for many of the plants that appear to have affinities with *O. acanthium* and / or *O. illyricum*. They certainly fit the Latin diagnosis given by Linnaeus (1753)—*O. calycibus squarrosis, foliis laciniis pinnatifidis.* Dodoens (1616), Bauhin (1651) and Morison (1699) also refer to the deeply dissected leaves. The leaves are to be contrasted with those of *O. acanthium* which are much less so, sometimes almost sinuate.

I believe that the error in the application of *O. illyricum* may well be of long standing. When Lamarck (1779) separated his *O. elongatum* (a superfluous name for *O. illyricum*) from *O. acanthium* on the basis of the flowering stems having little development of wings beneath the heads, he probably confused other species from southern France which were similar in this respect. It may be argued that Linnaeus who gave as locality for *O. illyricum* the vague S. Europe, may have had a wider view of the species than I have presented. Morison (1699) however wrote that the plant was spontaneous in Dalmatia, Illyria and Slavonia, areas which can be taken to include the far northern part of the Balkan Peninsula and part of the eastern Adriatic coast, certainly S. Europe to Linnaeus.

Conclusion

What then are we to do with the plants left over? It is important to examine thoroughly the existing literature relating especially to those species which have been cultivated, collect more material where required and to continue close study of specimens. Inspection of authentic material from European and other appropriate herbaria is indispensable. Such studies may well lead to the discovery of taxa not yet recorded for Australia.

There may well be some hybridization within the genus in Australia as there has been reported for Europe (Danin 1975), but I believe that before we invoke hybridization limits must be set on the variation we allow in each species. *Onopordum* is unusual in our thistles and close examination of its many special characters is important. In addition to the obvious features of leaves and phyllaries and the nature of the whole inflorescence, a close study is necessary of the complex corolla consisting of a long more or less S-shaped tube expanding into a campanulate limb variously incised to give rise to five narrow segments. The campanulate base of the limb and the segments may or may not be glandular. Absolute and relative proportions of the structures vary according to species. Pappus hairs may be scabrous, shortly barbed or plumose. The honeycomb-like receptacle may also be worthy of study, not to mention the apical appendage of the anthers and the various features of the achenes.

Without a surer knowledge of the identity of the plants we are working with, how can we communicate with other workers in the field in ecology, control, genetics, serology or whatever study we care to name.

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