WATSONIA

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THE *TARAXACUM* FLORA OF THE BRITISH ISLES

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Contents

Introduction

HISTORICAL

The first attempts to differentiate the British and Irish species of *Taraxacum* were made at the beginning of this century when Beeby, Marshall, Druce and others attempted to apply a few 'macrospecies' names to a number of forms. This met with mixed success, and the situation did not improve with the appearance of works by Handel-Mazzetti (1907) and Raunkiaer (1906). The complications arising from efforts to impose a 'macrospecies' system onto an agamospermous group have dogged the taxonomy of this and other genera ever since.

Later, Druce became aware of the work of Dahlstedt, Lindberg and Palmgren, who, following the discovery of agamospermy in *Taraxacum* by Murbeck in 1904, delimited 'microspecies', and later created sections in the genus. In the 1920's, Druce and Johnston sent a very large number of British collections to Dahlstedt, who described no less than 72 species from this material. Dahlstedt's determinations were all reported in the *Reports of the Botanical Society and Exchange Club of the British Isles*. Of these 72 new species, only 20 are recognised in the present work. Another 32 are synonyms, 12 are *nomina nuda* without types or descriptions (some resulting from Druce's mis-spellings of Dahlstedt's names), and 8 are, in my opinion, worthless due to the inadequacy of the type material.

In addition, Dahlstedt recorded another 81 species from the British Isles. Of these, I accept 53, although not all from the original Dahlstedt records. Of the remainder, 25 are mis-identifications, or are identified from material that I consider inadequate, and three are long-standing synonyms. This inauspicious start to the understanding of British and Irish *Taraxaca* has been instrumental in retarding interest in this important genus in the British Isles.

In 1933, Degelius, a colleague of Haglund at Stockholm, paid a visit to Ireland and Wales in search of lichens, and returned with a number of seed-packets of *Taraxacum*. These were grown at Lund, and the results published (Haglund 1935). Two new species were described (one of which is a synonym) and seven new species were recorded (one of which is a synonym for another unrecorded species). Eight new species were thus added to the British and Irish lists.

No further work was published until the late 1950's when van Soest, of the Hague, revised the collections of Oxford, Kew and the British Museum. This excellent work has done much to clarify problems of synonymy and mis-identification, and provides the corner-stones upon which the present work is based. Van Soest was able to identify 15 species new to the British Isles, making a total of 96 accepted species by 1960. Nearly 200 names had appeared in the literature for the British Isles by then. Since that time, with much help from Professor van Soest and Dr Lundevall, of Stockholm, I have recorded 28 more species from the British Isles and, in addition, described a further seven. Altogether 132 species are known at present.

With such a chequered history, it is not surprising that *Taraxacum* has earned

an equivocal taxonomic reputation in Britain. This is not true elsewhere. Scandinavia, in particular, has seen many competent Taraxacologists (at least 40 in as many years). Many of them, such as Gustafsson, Sørensen, Wendelbo, Persson and Hultén are well-known botanical personalities. They have used *Taraxacum* microspecies in geographical, ecological and genetic studies with some considerable effect.

In my opinion, such confidence is well-placed. I first approached the genus with a view to 'lumping' the microspecies into aggregates through the techniques of experimental taxonomy and taximetrics. Although this work produced results of interest, I became increasingly convinced that the microspecies obeyed all the dictates of 'good' species, being well-defined by constantly correlated characters, each microspecies with its own diagnostic geographical, ecological and genetic behaviour. It seemed that taxonomic difficulties had arisen, not so much as a result of the inherent difficulty of the genus, but more through a history of uncritical work. In particular, leaf characters seem to have caused confusion.

PHENOTYPIC PLASTICITY

All species, but particularly those belonging to the section Vulgaria, produce leaves of a wide variety of shapes during the life of the plant (Fig. A). Juvenile leaves are atypical, usually being ovate-spathulate and somewhat entire. These persist through to the second year, and even longer in some cases (e.g. the *T. croceum* group, nos. 52–57). It is likely that the leaves of (for instance) 17. *T. oxoniense*, 36. *T. faeroense*, 49. *T. lainzii* and 57. *T. hypochaeris* represent neotenous forms, never reaching, at least in some instances, the adult dissected condition. This argument can be carried further to suggest that the occurrence of various degrees of leaf-dissection found in individuals, in species and in groups of closely related species may be regarded as various phases on an ontogenetic scale. This ontogeny may be interrupted by habitat: plants from unusually shaded sites usually have rather entire leaves and cannot be identified. Conversely, plants from mown or grazed turf, paths or particularly exposed sites usually have very dissected leaves, which, combined with their dwarfness, renders identification very difficult. An additional difficulty is that in most species the ontogenetic pattern is recapitulated each year. The first leaves to emerge after the winter frosts are small, rather undissected, and bear what may be usefully regarded as the basic theme of characters in a simple form. These leaves, which are usually found around the outside of a plant in full spring flower are most important taxonomically, both for purposes of identification, and as a basis for the understanding of the phenotypic potential of the later leaves. These latter, usually more dissected, always bigger, and much more plastic, are dominant during the main flush of flowering. As flowering ceases, they die back, and are replaced by the summer leaves, of a phenotype which is maintained for the remainder of the season. These are still larger in most cases, and often even more dissected. In these summer leaves, the characteristic leaf morphology of each species is usually lost, and identification depends on other characters. However, these (for instance the posture, shape and colour of exterior bracts) can also become unreliable late in the season. For these reasons the identification of individuals from abnormally exposed or shaded sites, or from outside the main flowering period (April and May, except at altitude)

should never be attempted. Small juvenile forms should also be ignored in most cases, particularly in sections Spectabilia and Vulgaria.

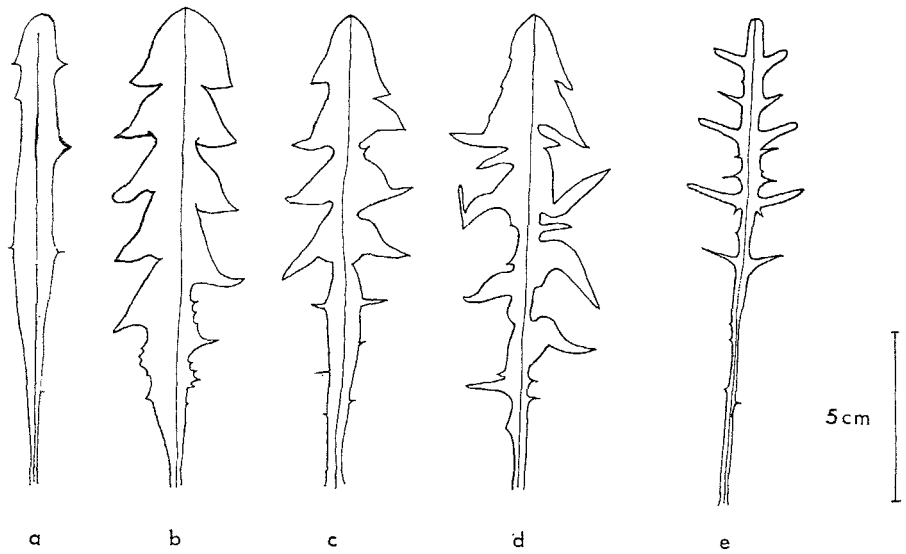

FIGURE A. Plasticity in leaf-shape in *Taraxacum nordstedtii* Dahlst.
(a) Juvenile leaf from Bix Bottom, Nettlebed, Oxford, 17/5/1968.
(b) Mature leaf from shade, Hexham, Northumberland, 14/5/1971.
(c) Mature leaf from meadow, Bråborg, Östergotland, Sweden, 10/6/1967.
(d) 'Summer form' leaf, Hexham, Northumberland, 19/9/1970.
(e) Cultivated plant, originally from Bontddu, Dolgellau, Merioneth. All plants transplanted to greenhouse conditions assume this morphology.

CULTIVATION

If identification is required of individuals in an unsuitable phase, the only solution is cultivation. *Taraxaca* grow very readily from seeds or roots, and spring-flowering individuals in the experimental garden or greenhouse can usually be identified. Summer and autumn-flowering specimens, however, show the usual difficult phenotypes (often accompanied by mildew), but the spring phenotypes can be induced in a greenhouse by subjecting the plants to a 12 hour day.

While cultivation is important as an aid to the identification of difficult material, it is also valuable as a taxonomic tool, for it is only through the comparison of two plants in standard conditions that sound conclusions may be drawn as to their relationship. For instance, cultivation has enabled many 'species' to be relegated to synonymy. However, the frequent criticism that *Taraxacum* species have not been tested in this way, and only represent phenotypic modifications of the same genotype (often made in the same breath as another frequent criticism, that *Taraxacum* species are untenable because there is an infinity of different genotypes!) is not on the whole justified. Although it is true that a number of *Taraxacum* species have not been tested in cultivation, this has been due to the lack of material suitable for cultivation, rather than any

shortcomings on the part of the taxonomist. Indeed, all the major *Taraxacum* taxonomists have been great cultivators, and the nature of the plasticity of *Taraxacum* leaves has been described by several of them. The poor quality of the British Dahlstedt species can be blamed on the quality of the material sent to him (the quality of *Taraxacum* material collected by the British has changed little in 50 years!) and his failing powers in later years. His early work, the foundations of *Taraxacum* taxonomy, is excellent and clearly shows his full understanding of phenotypic modifications.

SEXUALITY

One basic chromosome number is found throughout *Taraxacum*, $x=8$. Diploid ($2n=16$) species are invariably sexual, and usually self-sterile. It is thought that about 10% of all *Taraxacum* species may be of this type (Richards 1970a). These are mostly confined to Asia, but are also found in North Africa, Greenland, South America and in Europe. Two are native to the British Isles (1. *T. brachyglossum* and 67. *T. subcyanolepis*), but neither are restricted to the diploid state, and both can be agamospermous. Also, 5. *T. austriacum* and 66. *T. obtusilobum*, which have been found as casuals in this country, are diploid and sexual. It is not improbable that a rare type of facultative agamospermy described by Sørensen (1958) is also found in this country, although there is as yet no evidence of it. This might be found in some disomic triploid individuals ($2n=23$).

Triploid species ($2n=24$, or rarely 25, 26, 27, 28) are usually obligate agamosperms, that is to say that they are invariably apomictic in reproduction, producing seeds and progeny of an identical genotype to the parent, without sexual fusion, and with little if any recombination and segregation. This has the effect of minimising genetic variation within a species. Indeed, it may well be that many species are virtually genetically uniform and are unchanged since their origin as agamosperms.

However, triploids ($2n=24$) in species which have diploid members can be partially sexual. These are known as facultative agamosperms. This mechanism, which is found in the British species *T. brachyglossum* and *T. subcyanolepis*, is more fully explained elsewhere (Richards 1970a). These facultative agamosperms share with diploid sexuals the characters of small, regular pollen (due to a relatively regular male meiosis) and poor seed-set (due to self-incompatibility in sexual ovules).

Tetraploids ($2n=32$), pentaploids ($2n=40$) and hexaploids ($2n=48$), all found among British species, are, as far as is known, invariably obligate agamosperms.

The sexual species of Asia and southern Europe are no less critical taxonomically than the agamosperms. They form local races and clines and show polymorphism, and are in some cases but poorly separated. They occur in areas in which agamosperms are comparatively local, but in northern Europe, sexual species result in taxonomic chaos when growing with agamosperms. Populations in northern England containing *T. brachyglossum* and *T. subcyanolepis* cause considerable problems, and this has been shown to be due to hybridisation of the sexuals with polliniferous agamosperms (Richards 1970b). Sexuality was first suspected in *T. obtusilobum* on account of the wide range of phenotypes occurring in some Swedish populations (Gustafsson 1937). More recently, the

variation in the *T. punctatum* A. J. Richards—*T. austriacum* complex in Slovakia has been shown to be due to sexuality (Richards 1970c). It is not unlikely that the complexity of the *T. laetum*—*T. obscurans* Hagl. group in Sweden will be found to have a similar cause. However, sexuality is not common, and at most sites the individuals of a microspecies will show no variation, being probably of one genotype (see Fürnkranz (1966) for the opposite opinion). What is very probably the same genotype can be found throughout Europe, well-defined, and separated from its nearest relatives by a considerable taxonomic distance.

This situation is one for which I was unprepared, and which will sound remarkable to those not acquainted with the genus. Tradition says 'sexual species are not critical; agamosperms are'. Here we find the converse. Why should this be the case? I think it is likely that the sexual progenitors of the British species evolved in isolation in southern Europe or western Asia during the glacial periods. They did not evolve isolating mechanisms and are interfertile when they meet. At the close of the last glacial period they may have migrated north as an enormous 'hybrid swarm', meeting ancestral arctic agamospermous species (now placed in the sections Ceratophora Dahlst. and Arctica Dahlst.), and becoming 'fixed' as agamosperms as a result of hybridisation with them. Thus a vast hybrid swarm would have been 'frozen' in a short space of time, as inviolate genetic units in a vast morphological continuum (this model will be argued more fully in a forthcoming paper). The reason that this continuum has not been passed down to the present-time unscathed, is the same as that controlling the discreteness of sexual species. Natural selection operates on agamosperms just as efficiently as it does on sexual species, and we can only expect the fittest genotypes to have survived, resulting in the present morphological discontinuities, or, if it is preferred, species or microspecies.

THE STATUS OF *TARAXACUM* SPECIES

The principles governing the taxonomy of *Taraxacum*, and other genera containing obligate agamosperms, have long been a source of vigorous controversy. The two schools of thought can be briefly designated as 'splitters', who believe in describing agamospecies or microspecies, invariable genetic units of 'low' status such as are to be found in this account; and 'lumpers', who prefer to look for wider discontinuities which may be used to describe 'macrospecies' or 'circle-species'. These are frequently of a similar nature, or even identical to the sections used by the splitters. It must be admitted that the large number and the critical nature of microspecies found in such genera as *Hieracium*, *Rubus*, *Sorbus*, *Alchemilla*, *Crataegus* and *Ranunculus auricomus* agg. (and, to a great extent, in *Taraxacum*) are not suited for general use by the non-specialist. Just when they can be used is not readily stated. Many leading field-botanists have become proficient at the identification of critical groups, as the maps of *Hieracium*, *Sorbus* and *Alchemilla* in the *Critical Supplement to the Atlas of the British Flora* testify, and such expertise is of value especially when one or more specialists in the groups are willing to give fully of their time in aiding more difficult identifications and acting as a control and guide. Phytogeographical studies, and phytosociological work will undoubtedly benefit from the use of microspecies; and one must expect workers on physiological, genetic and cytological problems in the genera to be conversant with the microspecies taxonomy. At the same time, more general studies can quite usefully be restricted to taxa of a wider

scope, and here the 'macrospecies' can be defended. My personal opinion is that in most cases taxa of wider scope, the sections, already exist and should be used.

DISTRIBUTION OF SPECIES IN THE BRITISH ISLES

Although some Watsonian vice-counties have been fairly thoroughly covered, our knowledge of the distribution of the species over most of the country is at best uneven, and is mostly very inadequate (see p. 12). We are not yet anywhere near a state in which *Taraxacum* species can be mapped on a 10km grid. It is hoped that this goal will be achieved in the fairly near future, and it is towards this that this work is aimed, at least in part. Only then will we be able to make meaningful phytogeographic conclusions, based on an objective and thorough system. At present, many anomalies appear, and these will no doubt be seized upon by critics of this work, and of agamospecies in general. For instance, during this work I have resided at Durham (v.c. 66) and Oxford (v.cs 22 and 23). Not only do these counties figure prominently in the distribution lists, but many rare species are found to be restricted to one or more of them.

Although I admit this bias, and although these are among the few counties which I consider have received an adequate coverage, there are a few points to be made in defence. Firstly, the bias in favour of the Thames Valley basin is due more to the work of Druce, 50 years ago, than to mine. Secondly, other areas which I have worked thoroughly (Buckinghamshire (v.c. 24), Northumberland (v.cs 67 and 68) and Cumberland (v.c. 70) for instance) and which other people have worked (Cambridgeshire (v.c. 29), Channel Islands (v.c. S) and Mull (v.c. 103) do not show a concentration of rarities; while other, relatively little-known counties (Fife (v.c. 85), Mid-Perth (v.c. 88), Forfar (v.c. 90) and West Sutherland (v.c. 108) for instance) do show such a concentration. Furthermore, Durham and the Thames Valley have localities of some botanical renown, and it is in these (Upper Teesdale, the Thames meads etc.) that the rare dandelions are found. The bias is, I suspect, not important in the rare and local native species. These, being mostly of a relict nature, are found in well-known areas, favoured by botanists, much as rare and local species in other genera are. The bias is rather important in many of the commoner species however. There is no doubt that some of these are very widespread and may occur in every county, but at present they are recorded from only those counties for which there is adequate coverage. This is particularly true for species in the section Vulgaria. The distribution of the remainder is better known, and in many cases, although in no way exhaustive, the coverage may give a reasonable picture of the species' distribution in Britain. In Ireland, however, the coverage is totally inadequate, and most counties have no records whatsoever.

The recording bias can also be detected in the rare species that are thought to be introduced. These are plants of waste, man-made places, which are local, scattered and without a coherent distributional pattern in this country. Although in no case can recent introduction through the agency of man be proven, early records being far too scanty, in a number of species recent introduction can be very strongly suspected. Here there is a natural tendency for a recording bias in favour of the most thoroughly worked areas.

There are two groups of species belonging to the section Vulgaria restricted

in the main to the south Midlands, and centred around Oxford, which appear to be genuinely localised to this area. The 'mead' dandelions (85. *T. subundulatum*, 86. *T. sublaeticolor*, 108, *T. melanthoides*, 109. *T. tamesense*, 110. *T. fulgidum* and 111. *T. haematicum*) are confined to water-meadows mown for hay, principally in the Oxford area of the Thames Valley. The second is a group of local, south Midlands endemics (72. *T. stenacrum*, 82. *T. lacerabile*, 92. *T. cherwellense*, 122. *T. hemipolyodon* and 132. *T. cophocentrum*). This supposition is reinforced by the occurrence of other local endemics which are commonest in the south Midlands, but also found elsewhere (89. *T. valdedentatum*, 95. *T. porrectidens* and 104. *T. adsimile*). Two other species, 101. *T. mucronatum* and 126. *T. reflexilobum*, display what seems to be a genuine localisation to the south Midlands (they are conspicuous species that are locally common in this area) and are only otherwise found, locally, in eastern Fennoscandia. Whether this remarkable disjunction is a result of introduction is not clear.

In the other sections of *Taraxacum* occurring in the British Isles, the distributional patterns are more complete (presumably because the species look more 'interesting' and have therefore been more frequently collected), and some useful geographical distributions have emerged. There seem to be two 'Lusitanian' species, being restricted to western regions of the British Isles and the Iberian Peninsula (10. *T. hispanicum* and 49. *T. lainzii*). There is an arctic contingent, mostly restricted in Britain to high mountains in Scotland. This can be subdivided into 'general arctic' species found in Scandinavia, Iceland, Greenland and some of the arctic islands (52. *T. croceum*, 53. *T. ceratolobum* and 54. *T. cymbifolium*); non-Scandinavian species, occurring in Iceland, the Faroes and, in one case, Greenland (39. *T. reclinatum*, 56. *T. pycnosticum*); and Scandinavian species all of which occur also in Iceland (50. *T. naevosum*, 55. *T. craspedotum* and 57. *T. hypochaeris*). Species centred on western Scandinavia (e.g. 43. *T. maculigerum* and 44. *T. praestans*) are frequent. There are a few species which are centred on the Baltic (11. *T. gotlandicum*, 28. *T. obliquum*, 29. *T. platyglossum*); these are commonest in eastern Scotland. There are a few thermophilous species from France and Germany (e.g. 18. *T. retzii* and 24. *T. placidum*). However, on the whole our *Taraxacum* flora is Scandinavian, and there are very few species which are centred elsewhere. In particular, there are no examples of Alpine, Mediterranean or Pontic species native to the British Isles (5. *T. austriacum* is Pontic in affinity, but is almost certainly introduced).

The *Taraxacum* flora of Fennoscandia, the Netherlands and Switzerland is well known, and many species have been accurately mapped in these areas. That of northern France, northern Germany, the Baltic States of the Soviet Union, Poland, Czechoslovakia, Austria, Greece and Turkey is known to some extent. However, that of the Iberian peninsula, southern France, Italy, Yugoslavia and much of the Balkans and of Germany and the Soviet Union is at present very little known. It is to these areas that particular attention must be paid before an accurate picture of the overall distribution of European species can be obtained. These shortcomings must be borne in mind in considering the extra-British distribution quoted after each species. However, it seems likely that the European distribution of many species found in the British Isles, western Scandinavia, the Netherlands, Belgium, France and Germany, but absent from the Iberian Peninsula, the Mediterranean region and central and eastern Europe, is genuine.

It is surprising that relatively few of our species are endemic (compared with those of the Alps (van Soest 1969) or the genera *Hieracium*, *Rubus* and *Sorbus* in this country). Altogether, 25 out of 132 species appear to be endemic (19%). These are either widespread (34. *T. fulvicarpum*, 51. *T. laetifrons*), or local and apparently with specialised habitat requirements (22. *T. acutum*, 45. *T. anglo-larssonii*, 65. *T. cambriense* and several others, perhaps including the south Midlands endemics already referred to). A few are restricted to Orkney and/or Shetland (39. *T. acrifolium*, 41. *T. calophyllum*, 47. *T. subsimile* and 131. *T. orcadense*), but the pattern of local endemics so conspicuous in *Hieracium* and *Sorbus* is noticeably absent in *Taraxacum* in the British Isles. This suggests either that the genus is efficiently dispersed by seed (but so is *Hieracium*?), or, more probably, that the species are older, perhaps dating back to the end of the last glacial period in most instances, and that speciation has, at least for the present, effectively ceased.

IDENTIFICATION

If I have given the impression that *Taraxacum* species are readily identified, then I have misled. Through an understanding of genetic processes in a genus, and through an examination of distributional patterns, it is possible to interpret taxonomic problems in the light of knowledge of the evolutionary history of the morphological units. Thus we can expect *Rubus*, with not infrequent sexual behaviour in apomictic segregates, and *Rosa*, in which part of the genome is sexual and the remainder apomictic, to present extremely difficult taxonomic problems which may not lend themselves to artificial 'parcelling' in a taxonomic system. We must expect *Hieracium*, with many local endemics, which may be of rather recent origin, to display a bewildering array of forms, which, although distinct, are but slightly separable from their relatives. In this case natural selection may not have had sufficient time in which to 'weed-out' poorly adapted genotypes. In *Taraxacum*, at least in the British Isles, we find, for the most part, rather old, well-defined and stable species. However, due to the sheer number of species that occur, and also as a result of the complex patterns of leaf plasticity, correct identification is not easily achieved. In 1968 I circulated to some interested British botanists a duplicate key to the British and Irish species as they were then understood. It is true that this key had many imperfections, and at least some of these have been improved as a result of this experience. Also, no descriptions, illustrations or distributional notes were supplied, and in most cases no herbarium specimens were available. Most experienced field botanists (although without knowledge of *Taraxacum*) identified about 40% of specimens correctly. I hope that in the present work a much higher success rate may be achieved. Trials at the Department of Botany at Newcastle suggest that an 80% success rate is not being over optimistic. However, this is a critical and very plastic genus, and a useful level of correct identification by the inexperienced will only be achieved through the careful selection and preservation of material; the thorough examination of specimens (with particular emphasis on the characters of the involucre and achenes) and through being prepared not to name the often considerable amount of inadequate material. However, in all cases, there is no substitute for the use of a good reference herbarium. Reasonable collections are now to be found at the Botany Departments of the British Museum, and

Cambridge, Oxford and Newcastle Universities. Other collections of some substance exist at the Liverpool and Cardiff museums. However, the most important and substantial collections are to be found outside Britain, and it is necessary for the serious student of the genus to visit Leiden and Stockholm. The herbaria of Copenhagen, Helsinki and most other Scandinavian botanical centres also have excellent collections, and there is a fine living collection maintained at Uppsala.

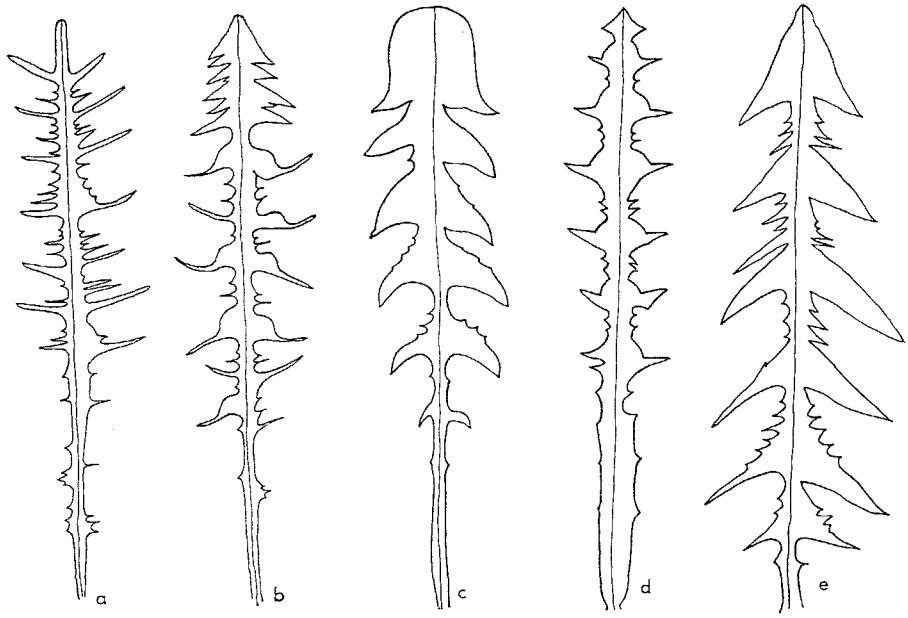

FIGURE B. Leaf characters in *Taraxacum.*

(a) Leaf narrow, oblong, laciniate; lateral lobes 5–6, narrow, ± linear, acute, patent or forward-pointing; terminal lobe tripartite; interlobes with large teeth and lobules. Petiole approaching ½ length of leaf, somewhat winged.

(b) Leaf rather narrow, oblong-lanceolate; lateral lobes 5, forward-pointing, patent or recurved, with linear processes, distal margin with a convex hump near the base; terminal lobe acute, sub-divided; interlobes long-acuminate, dentate. Petiole not or scarcely winged, ⅓ length of leaf.

(c) Leaf rather broad, lanceolate; lateral lobes 4, recurved, acute, with filiform teeth below, distal margin convex; terminal lobe rounded, helmet-shaped. Petiole ⅓ length of leaf, unwinged.

(d) Leaf narrow, oblong; lateral lobes 6, patent or somewhat forward-pointing, short, deltoid, distal margin with a concave angle; terminal lobe small, diamond-shaped; interlobes dentate. Petiole ⅓ length of leaf, winged.

(e) Leaf broad, lobate almost to base; lateral lobes 4 (5), recurved, long, narrowly triangular, straight-sided, acute, entire above, large-dentate below; terminal lobe sagittate, acute, entire; interlobes large-dentate and ± lobulate. Petiole very short, ± winged.

GLOSSARY

achene — The fruit (strictly speaking, a cypsela and not an achene). Measurements are of length, and exclude the cone and rostrum (Fig. C).

arachnoid Hairy, with the indumentum having the appearance of a spider's web.

blotched Interlobes coloured black or purple.

coloured Reddish or purple with anthocyanin.

cone The appendage to the achene, connecting the body of the achene to the rostrum (Fig. C).

corniculate The presence of a small appendage on the abaxial side near the apex on the exterior and interior bracts of species in the sections Erythrosperma and Obliqua.

exterior bracts The smaller external row of bracts surrounding the involucre; these may be adpressed (to the involucre, i.e. to the interior bracts), erect, spreading or recurved; these positions and intermediate ones represent the entire range from all exterior bracts pointing directly upwards to all being recurved. In the case of spreading bracts, individual bracts may be sub-erect or sub-recurved. Exterior bracts may have a white, scarious or coloured border.

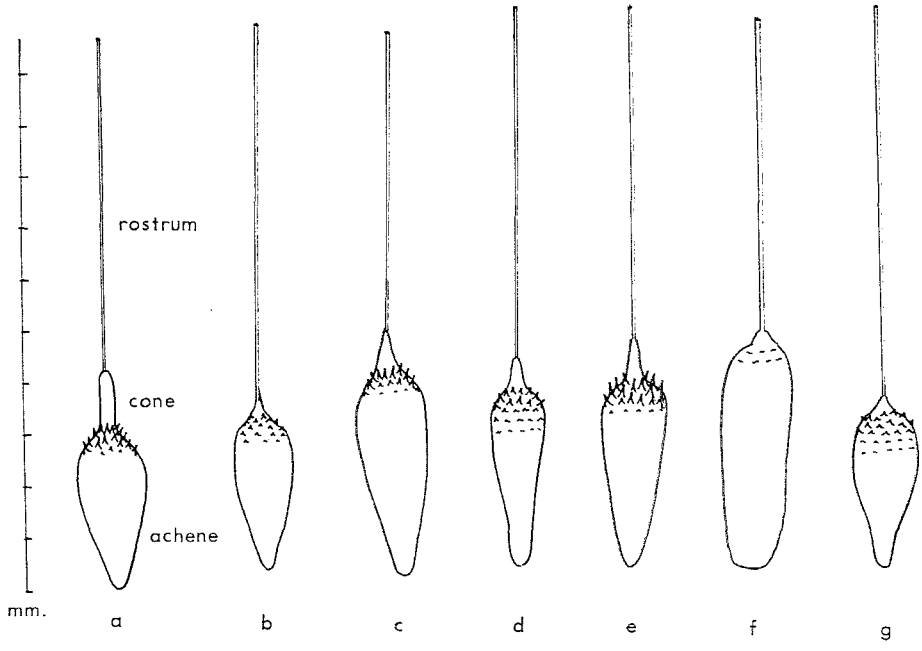

FIGURE C. Basic fruit-shapes in British *Taraxaca.*

(a) Section Erythrosperma.
(b) Section Obliqua.
(c) Section Palustria.
(d) Section Spectabilia, Naevosa group.
(e) Section Spectabilia, Crocea group.
(f) Section Spectabilia, Euspectabilia group.
(g) Section Vulgaria.

filiform-dentate Leaves with teeth which are narrowly linear and frequently flexuose.

interlobes The narrow parts of the leaf between the lobes.

laciniate Highly and irregularly divided and cut (as opposed to lobate).

leaf-lobes The lateral leaf-lobes.

lobule A leaf segment intermediate in size between a lobe and a tooth; often found on laciniate leaves.

leaves crisped Lobes crinkled.

pollen present The emerging style brushes past the anthers carrying pollen from the hidden anthers to the exterior. The presence of pollen is readily determined in fresh or dried plants by examination of the style with a lens.

processes The distal (usually linear) part of a leaf-lobe when clearly differentiated from the rest of the lobe (base) (Fig. B(b)).

rostrum The beak of the fruit, connecting the cone of the achene to the pappus (Fig. C).

spinulose Most species have small spines or tubercles on the achene near the cone (i.e. 'above').

spotted Some of the Spectabilia species (nos. 36–50) and 110. *T. fulgidum* have black spots on the leaf-lobes. This character seems to be under genetic control, but it is only manifested in certain conditions, one of which seems to be high insolation. Only the presence of spots is, therefore, of taxonomic significance.

striped The ligules of the outer florets of nearly all *Taraxacum* species have a single coloured stripe (usually red, grey or purple) on the back.

style discoloured or yellow This character refers to the colour of the style *in a dried condition.* In a few species it is clear or pale yellow; in the remainder discoloured: greenish, greyish or blackish. However, fungal attack or age can result in discolouration in yellow material. It is as well to examine several heads if possible.

style exserted Emerging above the level of the central florets.

terminal lobe The terminal, often ± entire, leaf-lobe; this may be subdissected, when it is incised like the lateral lobes, but to a lesser degree.

colours Fairly good matches on the Royal Horticultural Society and British Colour Council chart can be found for the following colours:—
violet 033, carmine 025, chestnut-red 014 (but darker), purple 1028, red 821, chestnut 013, brown 00918, pale green 860/3 pale yellow 2/2, orange-yellow 9, cinnamon 013/2, dark green 000861, deep yellow 7, straw 07/3.

The colour cinnamon is traditionally termed fulvous in *Taraxacum* (as in *T. fulvum*). However, this colour is not fulvous, as I understand the term, but is closer to cinnamon.

NOTES

1 MEASUREMENTS

All measurements are of length (in mm) unless otherwise stated, except those of the capitulum which are of the diameter when fully open. Measurements of scapes and exterior bracts are taken at the time of flowering.

2 CHROMOSOME COUNTS

These are all my own, unless otherwise stated; those asterisked are from British material. Observations on breeding behaviour are also my own.

3 DISTRIBUTION

The list of numbers following the notes on habitat and distribution are of Watsonian vice-counties (see Perring & Walters 1962, Dandy 1969), the total number being in brackets, e.g. (36, H2, S), H referring to Ireland and S to the Channel Islands. The abbreviations for European countries and the distributional areas, e.g., North-west Europe, are those used in *Flora Europaea* (Tutin *et alia* 1964).

4 TYPOLOGY

The typology of the British and Irish species is as yet incomplete, but it is hoped that an account of this will appear at a later date. The types of most of Dahlstedt's species are at Stockholm and some of his species have been lectotypified by Haglund. Those published in *Reports of the Botanical Society and Exchange Club of the British Isles* and in *Transactions and Proceedings of the Botanical Society of Edinburgh* are at Oxford and Edinburgh respectively. In these cases the lectotype is the specimen bearing Dahlstedt's manuscript description. Haglund's types are all at Stockholm. Those of van Soest are at Leiden. Those of the Finnish authors Lindberg, Palmgren, Brenner and Marklund have not been investigated, but are probably at Helsinki.

5 ILLUSTRATIONS

These are mostly drawn by Mrs K. Miller of the Botany School, Oxford. All are taken from herbarium specimens, mostly from the Fielding-Druce Herbarium at Oxford, but a few from Cambridge and the British Museum. The scale represents 5 cm.

6 VICE-COUNTY RECORDING

As mentioned above, the cover is most uneven. A few vice-counties, notably 22, 23, 66 and 67, have been fairly thoroughly worked, although there may still be some species to be found. The following are reasonably adequately covered, although further work will doubtless reveal many new records in every case:—
9, 12, 17, 20, 22–24, 29, 32, 39, 41, 45, 49, 58–60, 62, 66–68, 82, 88, 90, 92, 94, 96, 99–101, 103, 105, 108, 111, 112, S.
All records reported in this work have been checked personally.

COLLECTING

It is most important that specimens of *Taraxacum* be collected carefully and selectively if identification is to be feasible. For reasons stated earlier, specimens should only be collected during the first flowering period (until late May in lowland areas, and rarely after the end of June, even on mountain-tops). Specimens should be well-grown, and should not come from shaded, heavily trodden, mown or grazed areas, in which abnormal phenotyes are often adopted. If possible, and especially with small material, several specimens should be collected. It is useful if the style colour of the fresh specimen is noted, although this is not essential.

The specimen should be excised at the very top of the root. In many cases, it is necessary to divide the specimen to ensure that leaves do not overlap, and that adequate drying is permitted. The removal of small buds in the rosette may also facilitate drying. If possible, the specimen should show both flowering and fruiting capitula (the latter will often mature in the press). Young leaves may also be removed, but all old leaves should be preserved, and pressed as well as possible. Each leaf should be flattened individually revealing the complete outline, and they should be arranged symmetrically without overlapping. Capitula should be pressed from the side, rather than from above or below. Remnants of dried ligules from old capitula, and loose achenes should be preserved in separate packets; loose leaves and scapes should also be preserved, although individual ones are rarely sufficient for identification. Plants are best preserved if pressed immediately after collection. Although often staying fresh in a polythene bag for some days after collection, they curl up very rapidly and are not suitable for pressing. The press should be well-aerated and a generous amount of drying paper is essential; it is usually necessary to change the paper daily for at least 5 days, and for many specimens, especially in the section Vulgaria, twice-daily changes may be advisable.

Specimens which are submitted for identification should be pressed as described above; specimens which have become blackish or mouldy are usually impossible to name. Material should be loose or mounted with detachable mounts, not glued or mounted with adhesive strip. All material from the British Isles should be accompanied by a grid reference as well as other details.

Key to the Sections

1 Plant small, delicate with strongly dissected leaves; exterior bracts usually corniculate (plants of dry places) 2
Plant robust; exterior bracts never corniculate although sometimes with a small callus 3

2 Achenes pale brown; leaf-lobes 6–10; capitula deep yellow or orange-yellow, often involute (plants of dune-slacks etc.)... **Obliqua** (p. 40)
Achenes of varying colour, often reddish or purple; leaf-lobes 3–6 (– 10); capitula pale yellow or yellow, rarely involute **Erythrosperma** (p. 27)

3 Leaves linear, smooth, green, entire or ± lobed; exterior bracts, adpressed, ovate, with a broad scarious border (plants of fens etc.) ... ... **Palustria** (p. 42)
Leaves never linear, usually lobed; exterior bracts recurved to adpressed, linear to ovate-lanceolate, never with a broad scarious border ... 4

4 Leaves spotted, often dark, with a red petiole and mid-rib, sometimes green throughout; exterior bracts to 10 mm, ovate-lanceolate to lanceolate, spreading to adpressed; ligules often striped carmine or purple; pollen often absent; achenes 3·0–5·0 mm (plants of wet places)... ... ... **Spectabilia** (p. 45)
Leaves never spotted; exterior bracts 7–18 mm, erect to recurved, lanceolate to linear; ligules usually striped grey-violet, sometimes purple, never carmine; pollen usually present; achenes to 3·5 mm ... ... **Vulgaria** (p. 62)

There is some overlap between the sections Vulgaria and Spectabilia in the British Isles due to a number of species placed in the Vulgaria which are morphologically intermediate. The other sections are quite distinct, although 34. *T. fulvicarpum*, has affinities with both the Erythrosperma and Spectabilia, and 32. *T. anglicum* can be placed in either the Palustria or Spectabilia.

Sectional keys to the species

SECTION OBLIQUA

Leaves pale green; lobes obtuse; capitulum 25–30 mm, usually involute **28. obliquum**

Leaves dark green; lobes acute; capitulum 30–40 mm, sometimes involute **29. platyglossum**

SECTION PALUSTRIA

Pollen absent; leaves variable, extremely narrow; if lobed, then lobes very short, distant, deltoid; exterior bracts 7 mm, with a broad, scarious border **30. palustre**

Pollen present; leaves never lobed, narrowly spathulate, denticulate; exterior bracts 5 mm, with a greenish border ... **31. austrinum**

Pollen present; leaves shortly lobed, lobes 3–4, sagittate; exterior bracts 7 mm, with a clear, narrow, white border ... ... **32. anglicum**

SECTION ERYTHROSPERMA

1 Mature achenes straw-brown or pale brown, without a reddish tinge 2
Mature achenes purple, reddish, chestnut or cinnamon* 9

2 Petiole and midrib clear purple; leaf-lobes short, deltoid; exterior bracts to 5 mm, recurved ... ... **24. placidum**
Petiole green or dull purple, midrib usually green; leaf-lobes various, rarely short and deltoid; exterior bracts *c* 7 mm 3

3 Leaves laciniate; lobes linear, often variously directed 4
Leaves lobed; lobes triangular 6

4 External bracts to 7 mm, recurved; leaves grey-green ... **26. canulum**
External bracts to 10 mm, spreading to erect; leaves pale or dark green 5

5 Leaves dark green; petiole purple; involucre dark, suffused purple; ligules striped purple; pollen present ... ... **25. pseudolacistophyllum**
Leaves pale green; petiole green, or lightly suffused rose; involucre pale green with conspicuous white borders to the exterior bracts; ligules striped pale grey or unstriped; pollen usually absent ... **23. degelii**

6 Petiole narrowly winged; styles yellow or pale grey ... **27. proximiforme**
Petiole unwinged; styles darker 7

7 Exterior bracts recurved; leaf-lobes slightly recurved, the lower filiform-dentate ... ... **21. simile**
Exterior bracts spreading or erect; leaf-lobes triangular-dentate or scarcely dentate 8

* see note p. 11.

8 Leaf-lobes strongly recurved, terminal lobe acute; exterior bracts not clearly bordered ... ... **22. acutum**
Leaf-lobes scarcely recurved, terminal lobe rounded or tripartite; exterior bracts clearly bordered ... ... **23. degelii**

9 Achenes cinnamon 10
Achenes chestnut, red or purple 14

10 Exterior bracts erect, ovate-lanceolate... 11
Exterior bracts recurved, lanceolate 12

11 Leaf-lobes recurved, broad; pollen absent ... ...**16. fulviforme**
Leaf-lobes patent, narrow, terminal lobe often broad and long; pollen present ... ...**17. oxoniense**

12 Leaves narrowly oblong; lobes 7–10, short, lobules present; pollen absent **19. glauciniforme**
Leaves spathulate or lanceolate; lobes 4–6; pollen present or absent 13

13 Leaves rather broad; lobes long, scarcely dentate; exterior bracts to 10 mm; achenes 3·5 mm ... ... **18. retzii**
Leaves narrow; lobes short, acute, dentate; exterior bracts to 7 mm; achenes 3·0 mm ... ... **15. fulvum**

14 Styles clear yellow; petiole and midrib usually green 15
Styles discoloured (except in 7. *T. commixtum*); petiole and midrib with some red or purple (except in 13. *T. laetiforme*) 17

15 Achenes dark purple; leaves pale green ... ... **12. laetum**
Achenes brick-red; leaves dull green 16

16 Pollen present; styles always pure yellow ... ... **11. gotlandicum**
Pollen absent; styles dull yellow or greyish ... ...**13. laetiforme**

17 Petiole green; styles pale grey; exterior bracts recurved, linear **13. laetiforme**
Petiole coloured; styles usually discoloured, but not pale grey; exterior bracts rarely recurved or linear 18

18 Achenes *c* 3·5 mm; leaf-lobes linear, variously directed 19
Achenes *c* 3·0 mm; leaf-lobes not linear, or, if so, not variously directed 20

19 Achenes reddish; involucre robust; exterior bracts to 10 × 3 mm, erect; styles yellow ... ... **7. commixtum**
Achenes purple; involucre delicate; exterior bracts to 7 × 2 mm, recurved; styles discoloured ... ... **14. dunense**

20 Ligules involute; stigmas included; leaves dark, with 4, patent, acute, triangular lobes ... ... **2. argutum**
Ligules flat; stigmas exserted; leaves paler, or, if dark, not regularly triangular lobed 21

21 Exterior bracts not corniculate, adpressed; leaves pale green with 3–4, ± entire, short, wide-based, deltoid lobes ... ... **10. hispanicum**
Exterior bracts usually corniculate, not adpressed (sometimes erect); if leaves pale green, lobes narrow, dentate 22

22 Achenes dark purple-brown (puce); pollen absent; leaf-lobes 5–6, rather long, regular, acute, dentate ... ...**20. proximum**
Achenes sometimes dark purple, never puce; pollen present or absent; leaf-lobes rarely exceeding 4 23

23 Achenes warm chestnut-brown; exterior bracts 6 × 2 mm, recurved, clearly bordered; leaf-lobes 3, long, triangular-acute, strongly dentate ... ... **8. disseminatum**
Achenes sometimes chestnut-red, but scarcely brownish; exterior bracts and leaves various; leaf-lobes 4 or more 24

24 Achenes purple to dark violet; plant small, neat; base of plant clothed with persistent shining leaf-bases 25
Achenes reddish; plant often larger; leaf-bases not obviously persistent 26

25 Cone of achene *c* 1·5 mm; exterior bracts 4 × 1 mm; young scapes ± arachnoid below capitulum ... ... **5. austriacum**
Cone of achene *c* 1·0 mm; exterior bracts *c* 6 × 1·5 mm; scapes always glabrous ... ...**4. rubicundum**

26 Plant robust, pale glaucous-green; exterior bracts 8–10 mm, erect; capitulum *c* 40 mm ... ... **9. glaucinum**
Plant less robust, not glaucous; exterior bracts rarely exceeding 7 mm, ± spreading; capitulum *c* 30 mm 27

27 Pollen absent; leaves pure green; terminal lobe rounded ... **6. silesiacum**
Pollen present; leaves olive-green; terminal lobe acute 28

28 Exterior bracts *c* 6 × 1·5 mm, spreading, not suffused purplish; leaf-lobes usually broad at base ... ... **3. lacistophyllum**
Exterior bracts *c* 7 × 2 mm, spreading-recurved, suffused purplish; leaf-lobes usually narrow at base... ... ... **1. brachyglossum**

SECTION SPECTABILIA

1 Achenes reddish; exterior bracts spreading; leaf-lobes often strongly recurved 2
Achenes not reddish, usually straw-coloured; exterior bracts and leaf-lobes various 4

2 Exterior bracts ovate-acuminate, dark glaucous green, with a clear white border, pink-tipped; leaf-lobes strongly recurved, filiform-dentate ... **33. unguilobum**
Exterior bracts ± concolorous; leaf-lobes various 3

3 Leaf-lobes recurved, coarsely dentate ... ... **34. fulvicarpum**
Leaf-lobes ± patent, entire ... ... **54. cymbifolium**

4 Exterior bracts adpressed to erect in flower; petiole purplish ... 5
Exterior bracts spreading, or, if erect, petiole green 15

5 Leaves often spotted; ligules striped carmine (except 40. *T. acrifolium*); pollen absent; achenes straw-coloured, exceeding 4·0 mm (pentaploids) 6
Leaves never spotted; ligules not striped carmine (sometimes purple); pollen often present; achenes variously coloured, not exceeding 4·0 mm 9

6 Terminal leaf-lobe very long (about ½ length of leaf), narrow, acute ... **40. acrifolium**
Terminal leaf-lobe shorter 7

7 Leaves ± entire, almost glabrous, dark, shining; capitulum *c* 55 mm; achenes exceeding 4·5 × 1·2 mm ... ... **38. eximium**
Leaves lobed, or sometimes entire; capitulum *c* 40 mm; achenes 4·0–4·5 (–5·0) × 1·0–1·2 mm 8

8 Leaf-lobes 2–3, or leaves entire; exterior bracts ovate-lanceolate ... ... **36. faeroense**
Leaf-lobes 4–6; exterior bracts variable, but more usually lanceolate 9

9 Leaf-lobes with sigmoid margins above; achenes 4·0 × 1·3mm, with broad-based spinules above (very rare) ... ... **39. reclinatum**
Leaf-lobes lacking sigmoid margins; achenes 4·3 × 1·0mm, scarcely spinulose (common) ... ... **37. spectabile**

10 Leaf-lobes concave on distal margin 11
Leaf-lobes convex on distal margin 12

11 Exterior bracts clearly bordered; achenes 3·8 mm, straw-coloured (Wales) **65. cambriense**
Exterior bracts not bordered; achenes 3·5 mm, olive-brown (common) ... **61. nordstedtii**

12 Leaf-lobes strongly dentate (Orkney) ... ... **41. calophyllum**
Leaf-lobes scarcely or sparsely dentate 13

13 Ligules long, striped grey-purple (common) 14
Ligules short, striped purple (very local species) 15

14 Leaves pale green; lobes short, strongly recurved (W. Ireland) ... ... **64a. hibernicum**
Leaves dull, blue-green; lobes not as above (widespread) ... **64. adamii**

15 Pollen present; leaf-interlobes very narrow (Upper Teesdale) ... ... **60. pseudonordstedtii**
Pollen absent; leaf-interlobes broader... 16

16 Leaf-lobes 2–3, distant, ± sagittate (water-meadows, Oxford) ... ... **63. litorale**
Leaf-lobes 4–5, neither distant nor sagittate (Glen Clova) ... ... **59. caledonicum**

17 Leaves pale to mid-green, rarely spotted; petiole green; capitulum deep yellow or orange-yellow 18
Leaves dark green (except in 51. *T. laetifrons*), often spotted; petiole purple; capitulum pale yellow or yellow 24

18 Leaves small; lobes recurved, distal margin convex (marshes, Kent) ... **62. hygrophilum**
Leaves medium-sized; leaves entire, or, if lobed, lobes patent ... 19

19 Leaves oblong, obtuse, coarsely dentate (Inverness)... **57. hypochaeris**
Leaves lanceolate, lobed 20

20 Leaf-lobes 2–3, long, sagittate (N. Scotland) ... ... **47. subsimile**
Leaf-lobes 4–8, shorter (high mountains) 21

21 Exterior bracts spreading-recurved, narrowly lanceolate, scarcely bordered **54. cymbifolium**
Exterior bracts spreading-erect, ovate-lanceolate, clearly bordered... 22

22 Leaf-lobes 6–9, narrow ... ... **53. ceratolobum**
Leaf-lobes 3–5, broader... 23

23 Terminal leaf-lobe short, often rounded; achenes *c* 3·5 mm ... ... **55. craspedotum**
Terminal leaf-lobe not very short, acute; achenes *c* 4·0 mm... **52. croceum**

24 Terminal leaf-lobe rounded 25
Terminal leaf-lobe acute 26

25 Leaves large, stiffly erect, grey-green; lobes strongly recurved, long ... **58. stictophyllum**
Leaves smaller, weak, yellowish-green; lobes patent, short... **48. drucei**

26 Pollen present 27
Pollen absent 28

27 Leaves narrow; petiole unwinged ... ... **43. maculigerum**
Leaves broader; petiole winged ... ... **42. euryphyllum**

28 Leaves smooth, unspotted; lobes short, narrow, deltoid; achenes 3·0 mm **35. landmarkii**
Leaves rough, spotted; lobes longer, not deltoid; achenes 3·5 mm... 29

29 Capitulum *c* 30 mm; plant small, delicate; leaves spathulate, entire or shortly lobed ... ... **49. lainzii**
Capitulum *c* 40 mm; plant robust; leaves lanceolate, lobed... ... 30

30 Leaf-lobes strongly recurved ... ... **46. naevosiforme**
Leaf-lobes patent or slightly recurved 31

31 Leaves never spotted, pale green; lobes strongly dentate ... **51. laetifrons**
Leaves often spotted, dark green; lobes entire, or filiform-dentate... 32

32 Petiole winged; leaves rough 33
Petiole unwinged; leaves smooth 35

33 Involucre large; capitulum *c* 50 mm ... ... **50. naevosum**
Involucre smaller; capitulum *c* 40 mm 34

34 Leaves narrow, pure green; involucre 'thistle-like' (with overlapping rows of stiff, glaucous bracts) ... ... **56. pycnostictum**
Leaves broader, dull green; involucre not thistle-like... **42. euryphyllum**

35 Achenes 3·0 mm; leaves unspotted; lobes short, narrow, deltoid ... ... **35. landmarkii**
Achenes 3·5 mm; leaves often spotted; lobes rarely deltoid... ... 36

36 Leaves shining, dark green, usually with red, purple or black markings; lobes regular, patent (rare) ... ... **45. pseudolarssonii**
Leaves dull green with black markings or unspotted; lobes irregular (widespread) 37

37 Petiole and midrib purple, shining; terminal leaf-lobe about $\frac{1}{3}$ length of leaf, subdivided into lobules ... ... **44. praestans**
Petiole and midrib dull violet or purple; terminal leaf-lobe short, entire .... **43. maculigerum**

SECTION VULGARIA

1 Pollen absent 2
Pollen present 5

2 Stigmas yellow in living and dried condition... 3
Stigmas orange-yellow, dirty yellow or discoloured in living condition, discoloured when dry... 4

3 Leaf-lobes short, recurved, usually with one tooth ... **107. duplidens**
Leaf-lobes longer, ± patent, with up to 4 teeth ... ... **88. tanylepis**

4 Terminal leaf-lobe helmet-shaped, long, entire ... ... **73. inane**
Terminal leaf-lobe not helmet-shaped, short, usually dentate ... ... **124. parvuliceps**

5 Petiole white or green, or occasionally faintly rose at base, mid-rib usually green 6
Petiole and mid-rib with some red or purple colouration 31

6 Exterior bracts strongly suffused with purple... 7
Exterior bracts colourless, or almost so 10

7 Leaves grey-green, entire, or if lobed, lobes short, entire, obtuse ... ... **66. obtusilobum**
Leaves green, lobed; lobes longer, acute 8

8 Leaf-lobes distant, patent, narrow; exterior bracts spreading-erect ... **91. laciniosum**
Leaf-lobes recurved, broader; exterior bracts recurved 9

9 Leaf-lobes markedly convex on distal margin; exterior bracts violet-purple ... ...**68. cyanolepis**
Leaf-lobes straight-sided or distal margin slightly convex; exterior bracts reddish-purple ... ... **67. subcyanolepis**

10 Petiole broadly winged 11
Petiole unwinged, or almost so... 19

11 Leaf-lobes 5–8 12
Leaf-lobes 2–4 17

12 Leaf-lobes strongly recurved ... ... **77. pallescens**
Leaf-lobes variously directed 13

13 Leaf-lobes obtuse; exterior bracts spreading-erect ... ... **84. insigne**
Leaf-lobes acute; exterior bracts recurved 14

14 Leaf-lobes with large teeth; petiole ± absent ... **80. aequisectum**
Leaf-lobes lacking teeth, or with filiform teeth; petiole about ¼ length of leaf 15

15 Capitulum *c* 45 mm, orange-yellow ... ... **81. croceiflorum**
Capitulum *c* 60 mm, mid-yellow 16

16 Leaf-interlobes lobulate; terminal lobe short, deltoid ...**79. lingulatum**
Leaf-interlobes without lobules; terminal lobe longer, sagittate ... ... **74. procerum**

17 Leaf-lobes large, usually 2, distal margin convex-rounded... ... ... **70. ancistrolobum**
Leaf-lobes smaller, 3–4 (–5), distal margin straight-sided or convex... 18

18 Exterior bracts 4–6 mm wide, pale green; leaves pale green... ... ... **83. expallidiforme**
Exterior bracts 3 mm wide, glaucous, pink-tipped; leaves darker... ... **78. alatum**

19 Leaf-lobes 3–4, long, narrow, proximal and distal margins strongly dentate; capitulum 35–40 mm ... ... **89. valdedentatum**
Leaf-lobes 4–6, proximal margin entire; capitulum 35–60 mm ... 20

20 Leaf-lobes rather broad, slightly recurved, not ending in linear processes; capitulum *c* 40 mm 21
Leaf-lobes patent or variously directed (rarely recurved), ending in linear processes; capitulum 40–60 mm 23

21 Terminal leaf-lobe attenuate; petiole about $\frac{1}{2}$ length of leaf... ... ... **75. pannucium**
Terminal leaf-lobe short; petiole about $\frac{1}{4}$ length of leaf 22

22 Exterior bracts 7×2 mm, stiff, spreading, dark green ... ... **87. tenebricans**
Exterior bracts 10×2 mm, lax, recurved, often suffused violet ... ... **69. sellandii**

23 Linear processes strongly recurved, especially at tip... **90. spilophyllum**
Linear processes variously directed, not strongly recurved... ... 24

24 Exterior bracts spreading or erect 25
Exterior bracts recurved 28

25 Linear processes of leaf-lobes often recurved; terminal lobe distinct, obtuse, often rounded or elongated ... ... **76. linguatum**
Linear processes of leaf-lobes patent or variously directed; terminal lobe indistinct, dissected 26

26 Linear processes of leaf-lobes often pointing forward, rather short; exterior bracts to 3·5 mm wide 27
Linear processes of leaf-lobes never pointing forward, long; exterior bracts 4–6 mm wide ... ... **82. lacerabile**

27 Plant robust; involucres *c* 18 mm wide; exterior bracts 12×3 mm ... **85. subundulatum**
Plant slender; involucres *c* 10 mm wide; exterior bracts 8×2 mm... ... **86. sublaeticolor**

28 Leaf-lobes somewhat obtuse; capitulum 40 mm ... **92. cherwellense**
Leaf-lobes acute; capitulum 55–60 mm 29

29 Terminal leaf-lobe rather long, sagittate ... ... **74. procerum**
Terminal leaf-lobe shorter, not sagittate 30

30 Leaf-lobes recurved; exterior bracts 4–5 mm wide ... **71. sublaciniosum**
Leaf-lobes patent; exterior bracts 2–3 mm wide ... ...**72. stenacrum**

31 Leaves very narrow; terminal lobe long, $\frac{1}{3}$–$\frac{1}{2}$ length of leaf; exterior bracts erect ... ... **97. copidophyllum**
Not as above; terminal leaf-lobe always less than $\frac{1}{3}$ length of leaf .. 32

32 Terminal leaf-lobe ± rounded 33
Terminal leaf-lobe obtuse or acute, but not rounded 35

33 Leaves not spotted or blotched; petiole dull purple; exterior bracts recurved ... ... **132. cophocentrum**
Leaves sometimes spotted or blotched; petiole shining purple; exterior bracts spreading 34

34 Involucre 10 mm wide; capitulum 40 mm ... ... **110. fulgidum**
Involucre 15 mm wide; capitulum 50 mm ... ... **131. orcadense**

35 Leaves dark green; lobes 3–5, recurved, distal margin convex; exterior bracts spreading or erect (the *T. hamatum* group, nos. 108–118) ... 36
Not as above; exterior bracts usually recurved 45

36 Exterior bracts suffused with purple; terminal leaf-lobe obtuse, apiculate 37
Exterior bracts green, or partially or lightly coloured; terminal leaf-lobe usually acute 39

37 Leaves mid-green, without dark blotches; mid-rib green ... ... **118. oblongatum**
Leaves dark green, often blotched dark on interlobes; mid-rib purple 38

38 Leaf-lobes 3, short, entire or filiform-dentate (rare) ... **109. tamesense**
Leaf-lobes 4, longer, shortly dentate (common) ... **116. marklundii**

39 Exterior bracts erect; achenes *c* 3·5 mm 40
Exterior bracts spreading; achenes *c* 3·0 mm... 41

40 Exterior bracts dark green, the outermost 1 mm wide... **113. bracteatum**
Exterior bracts very dark, glaucous green, the outermost 2·5 mm wide ... **114. hamatum**

41 Exterior bracts with clear, white borders ... ... **112. christiansenii**
Exterior bracts not obviously bordered 42

42 Leaf-lobes 3, distant; interlobes usually blotched dark, bearing teeth and lobules ... ... **105. longisquameum**
Leaf-lobes 4–5, not distant; interlobes sometimes blotched dark (in 111. *T. haematicum*), entire or filiform-dentate 43

43 Petiole bright purple; distal margin of leaf-lobes straight-sided or even concave, not convex ... ... **111. haematicum**
Petiole dull purple; distal margin of leaf-lobes usually convex, occasionally straight-sided 44

44 Leaves and lobes rather narrow; petiole unwinged; exterior bracts erect-spreading ... ... **115. hamatiforme**
Leaves and lobes rather broad; petiole ± winged; exterior bracts spreading-recurved ... ... **117. latisectum**

45 Leaf-lobes with linear processes 46
Leaf-lobes not differentiated into base and linear processes 50

46 Linear processes of leaf-lobes recurved ... ...**99. aurosulum**
Linear processes of leaf-lobes patent or variously directed 47

47 Capitulum *c* 35 mm; leaves decumbent 48
Capitulum *c* 55 mm; leaves erect 49

48 Leaves grey-green; processes linear, ± obtuse ... **128. canoviride**
Leaves dark green; processes very narrow, tapering to an acute apex ... **127. crispifolium**

49 Leaf-lobes 5–9, distal base lacking a convex hump; interlobes dentate, but lacking lobules... ... ... **93. aequilobum**
Leaf-lobes 7–10, distal base often enlarged with a convex hump; interlobes with conspicuous narrow lobules ... ... **98. pectinatiforme**

50 Upper leaf-lobes conspicuously dentate 51
Upper leaf-lobes entire, or with a few filiform teeth... 57

51 Exterior bracts spreading-erect, 14 × 4 mm ... ... **122. hemipolyodon**
Exterior bracts variously directed, less than 10 × 3 mm 52

52 Leaf-lobes 6–8, strongly recurved; interlobes usually with dark blotches... **126. reflexilobum**
Not as above; leaf-lobes never strongly recurved 53

53 Leaves dark green, lacking dark blotches on the interlobes; exterior bracts spreading 54
If leaves dark, then with dark blotches on the interlobes; exterior bracts recurved 55

54 Mid-rib dull purple; terminal leaf-lobe ± entire ... **121. duplidentifrons**
Mid-rib green; terminal leaf-lobe dentate ... ... **123. obscuratum**

55 Leaves olive-green, lacking dark blotches, oblong; terminal lobe sub-dissected, indistinct ... ... **129. obliquilobum**
Leaves dark green, with dark blotches on the interlobes, lanceolate; terminal lobe ± distinct 56

56 Scapes usually about ½ length of leaves at flowering; leaf-lobes 4–5, longer, distal margin usually somewhat convex ... ... **119. maculatum**
Scapes usually equalling leaves at flowering; leaf-lobes 5–6, short, distal margin never convex ... ...**125. polyodon**

57 Stigmas yellow in living and dried condition... 58
Stigmas orange-yellow, dirty yellow or discoloured in living condition, discoloured when dried 59

58 Terminal leaf-lobe narrow, acute; lobes regular, recurved ... **130. privum**
Terminal leaf-lobe broad, helmet-shaped; lobes irregular, patent or slightly recurved ... ... **100. xanthostigma**

59 Exterior bracts with conspicuous white borders ... **112. christiansenii**
Exterior bracts ± unbordered 60

60 Capitulum exceeding 55 mm; leaf-lobes 2–3 (–5) ... **102. dilatatum**
Capitulum rarely exceeding 55 mm, if so, then leaf-lobes 4 or more... 61

61 Leaf-lobes tapering to a long, acuminate point 62
Leaf-lobes sometimes long and tapering, but, if so, not acuminate 64

62 Leaf-lobes 5–8; involucre more than 20 mm wide; capitulum exceeding 55 mm ... ...**99. aurosulum**
Leaf-lobes 3–5; involucre less than 20 mm wide; capitulum less than 55 mm 63

63 Leaf-lobes strongly recurved; exterior bracts recurved, green ... ... **96. biforme**
Leaf-lobes patent or slightly recurved; exterior bracts spreading, suffused purple ... ... **101. mucronatum**

64 Leaves dark green, with dark blotches on the interlobes 65
Leaves rarely dark green, never with dark blotches on the interlobes 69

65 Exterior bracts *c* 14 × 4 mm, recurved, green ... ... **120. fasciatum**
Exterior bracts rarely exceeding 12 × 3 mm, spreading and often suffused purple 66

66 Leaf-lobes ± convex on distal margin; exterior bracts recurved, suffused purple 67
Leaf-lobes straight-sided or concave on distal margin; exterior bracts ± spreading, green 68

67 Leaves narrow; scapes exceeding leaves at flowering... **108. melanthoides**
Leaves broader; scapes about ½ length of leaves at flowering ... ... **119. maculatum**

68 Leaf-lobes 3, distant; interlobes dentate and lobulate... **105. longisquameum**
Leaf-lobes 4–5, not distant; interlobes entire or filiform-dentate... ... **111. haematicum**

69 Petiole bright purple; terminal leaf-lobe usually rather long, subdivided **106. dahlstedtii**
Petiole dull purple; terminal leaf-lobe short, ± entire (except 129. *T. obliquilobum*) 70

70 Leaf-lobes narrow, lingulate, usually 5–8, crowded; leaves usually pale green 71

Leaf-lobes triangular, usually 4–5, not crowded; leaves usually mid-green 72

71 Involucre more than 20 mm wide; capitulum exceeding 55 mm ... ... **99. aurosulum**
Involucre *c* 15 mm wide; capitulum *c* 45 mm ... **95. porrectidens**

72 Leaves oblong, olive-green; interlobes dentate and lobulate ... ... **129. obliquilobum**
Leaves lanceolate, pure green; interlobes entire or dentate... ... 73

73 Leaf-lobes 2–4, large; terminal lobe large, subdivided ... **94. ekmanii**
Leaf-lobes 4–7, smaller; terminal lobe smaller, entire 74

74 Leaf-lobes recurved, regular, straight-sided ... ... **104. adsimile**
Leaf-lobes patent or slightly recurved, slightly irregular; distal margin somewhat concave ... ...**103. cordatum**

Section Erythrosperma

Section **ERYTHROSPERMA** (H. Lindb. f.) Dahlst., *Acta Fl. Suec.*, **1**: 41 (1921), *emend.* H. Lindb. f., *Acta bot. fenn.*, **17**: 8 (1935)

Erythrosperma H. Lindb. f. *Acta Soc. Fauna Flora fenn.*, **29** (9): 45 (1907)
Section *Dissimilia* Dahlst., *K. svenska Vetenskakad. Handl.*, ser. 3, **6** (3):3 (1928)
Section *Fulva* M. P. Chr., *Bot. Iceland*, **3** (3):253 (1942)

Plants small (—medium-sized), delicate. Leaves never spotted in the British species, strongly dissected; petiole and mid-rib usually coloured. Exterior bracts small, rarely exceeding 7mm, recurved to adpressed, corniculate. Achenes to 3·5mm, narrow, violet, purple, red, chestnut, brown, cinnamon or straw-coloured; cone *c* 1·0mm long and cylindrical. $2n = 16, 17, 18, 22, 23, 24, 32$ (usually 24 or 32). Sexuals, facultative agamosperms or obligate agamosperms, usually the latter. Flowering April or May.

Dry places; rocky and sandy ground and short grassland, usually with a shallow soil and full insolation (south-facing and unshaded). Throughout Europe except for montane regions and the Arctic, but present in all countries except Svalbard. Outside Europe native only in Turkey, Iran and Afghanistan, but introduced into North America (van Soest 1958) and probably elsewhere.

These are among the shortest-lived *Taraxaca*. In cultivation they may flower within 3 months of germination, and they may be biennial in some localities. Certain dark-fruited species (4. *T. rubicundum*, 6. *T. silesiacum*, 5. *T. austriacum*, 12. *T. laetum* and a number of non-British species) can have silver-grey achenes. This is controlled by a single gene (Richards 1970b) and is of no taxonomic significance. These must not be confused with inviable seeds which are very thin, lacking contents, and are also of a silver colour. These latter can indicate sexuality, which is found in at least two British species in this section. The section seems to be a natural one, and may have arisen spontaneously from the Asian and the Mediterranean section Erythrocarpa Hand.-Mazz. *emend.* Dahlst. However, 34. *T. fulvicarpum*, here placed in the Spectabilia, and the Scandinavian *T. intercedens* Markl., sometimes assigned to the Palustria, are of uncertain sectional status.

SPECIES WITH REDDISH OR PURPLISH ACHENES (NOS. 1–14)

1. T. brachyglossum (Dahlst.) Dahlst. in Sernander *et alia*, *Bot. Studier till. F. R. Kjellman*, 183 (1906)

T. erythrospermum subsp. *brachyglossum* Dahlst., *Bot. Not.*, **1905**: 170 (1905)

T. brachyglossum (Dahlst.) Dahlst. in Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 257 (1906)

Leaves 30–200mm, dull green; leaf-lobes 4–6, patent or slightly recurved, narrow, sometimes linear; petiole dull purple, unwinged. Scapes 30–150mm, prostrate to erect, usually suffused purple, arachnoid below the capitulum; *exterior bracts 7 × 2mm*, spreading, *glaucous, usually suffused purplish above*, corniculate, with a pale border; capitulum 20–30mm, yellow; ligules striped purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, chestnut-red; cone 0·9mm. $2n = 16^*, 17^*, 18^*, 20^*, 22^*, 24^*, 26^*$. Sexual, facultative agamosperm or obligate agamosperm. **Fig. 1.**

Dry places: calcareous downs, sandy heaths, sand-dunes, walls etc. Widespread and locally frequent throughout Britain. Not recorded from Ireland. 1–3, 5, 6, 9, 10, 12–17, 20–26, 28, 29, 32–41, 44, 45, 47–49, 52, 55–60, 62, 64, 66–71, 82, 85, 88–91, 93–98, 101, 103, 105, 109, S. (68, S). Native.
Central Europe extending westward to France and Britain, and northwards to southern Scandinavia. Au, Be, Br, Da, Ga, Ge, He, Ho, It, Ju, No, Su.

One of the commonest of the British Erythrosperma species, *T. brachyglossum* is readily recognised by its spreading, glaucous-purple exterior bracts, discoloured, polliniferous styles and reddish achenes. It is the commonest British species to show partial and complete sexuality; hybrids have been reported with 17. *T. oxoniense*, 67. *T. subcyanolepis* and 114. *T. hamatum*. However, sexuals do not seem to be very common and *T. brachyglossum* frequently occurs alone in pure populations. Nevertheless, the possibility of hybrids should always be borne in mind when examining populations of this species.

2. T. argutum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**:619 (1929)

Leaves 50–100mm, dark green, shining; leaf-lobes 4–5, regular, triangular, acute, scarcely dentate; petiole dull purple, scarcely winged. Scapes 100–150mm, erect, arachnoid below the capitulum; exterior bracts 6 × 2mm, spreading, green, scarcely corniculate, unbordered; capitulum deep yellow, *closed; ligules involute; styles inserted, pollen absent*. Achenes 3·0mm, deep red; cone 0·8mm. $2n = 24^*$. Obligate agamosperm. **Fig. 1.**

Dry calcareous places and sandy roadsides under light shade. Local and restricted to southern and north-west England and central Scotland. 9, 15, 17, 22–24, 26, 30, 60, 69, 88, 89, 101. (13). Endemic.

This is the only British Erythrosperma species with habitually closed capitula and involute ligules. This condition is occasionally found in other species, from which it can be satisfactorily distinguished by its dark green, regularly triangular-lobate leaves. Seed production is usually rather poor, and it may be that this species has evolved from triploid facultatively agamospermous forms of 1. *T. brachyglossum*, achieving obligate agamospermy through structural isolation (the closed ligules and capitulum) rather than meiotically (Richards 1970a).

3. T. lacistophyllum (Dahlst.) Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 257 (1906)

T. erythrospermum subsp. *lacistophyllum* Dahlst., *Bot. Not.*, **1905**: 168 (1905)

Leaves 30–200mm, mid-green; leaf-lobes 4–6, patent, narrow, entire, *abruptly widening at base*; petiole dull purple, unwinged. Scapes 50–200mm, erect, rarely coloured, arachnoid below the capitulum; *exterior bracts 6 × 1·5mm*, spreading (to erect), *green*, corniculate, scarcely bordered; capitulum 20–30mm, yellow; ligules striped purple; styles exserted, discoloured, pollen present. Achenes 2·7mm, dark red; cone 0·8mm. $2n = 24$*. Obligate agamosperm. **Fig. 1.**

Dry places: calcareous downs, sandy heaths, walls, paths etc. Commoner in towns than 1. *T. brachyglossum* and rare or absent on sand-dunes. Widespread and locally common in southern England, becoming rare northwards; not recorded from Ireland. 1–3, 6–12, 14–26, 28, 29, 32, 34, 36–42, 44, 45, 49, 52, 54, 55, 57–60, 62, 64–66, 69, 71, 75, 78, 81–83, 85, 90, 96, 106, S. (59, S). Native. Western Europe, southern Scandinavia and the Baltic. Be, Br, Da, Ga, Ge, He, Ho, Hs, Lu, No, Rs(B), Su.

T. lacistophyllum is best distinguished by the abruptly expanded bases to the leaf-lobes, which give the leaf a distinctive appearance. Small forms are not easily distinguished from 1. *T. brachyglossum*, except on involucral characters.

4. T. rubicundum (Dahlst.) Dahlst. in Sernander *et alia*, *Bot. Studier till. F. R. Kjellman*, 183 (1906)

T. erythrospermum subsp. *rubicundum* Dahlst., *Bot. Not.*, **1905**:166 (1905)

A small and delicate plant. Leaves 20–70mm, dull green, *very dissected*; leaf-lobes 4–7, patent or pointing forward, linear; interlobes narrow, straight, dentate; petiole dark violet-purple, unwinged; persistent dark leaf-bases conspicuous. Scapes many, 50–80mm, thin, wiry, purplish, *glabrous; exterior bracts 5 × 1·5mm, erect, ovate, dark glaucous green*, often suffused purple, conspicuously corniculate, bordered; capitulum 15–20mm, pale yellow; ligules, short, striped dark violet; styles exserted, discoloured, pollen present or *absent. Achenes 2·5mm, dark violet*; cone 1·0mm. $2n = 24$*. Obligate agamosperm. **Fig. 1.**

Dry places; mostly restricted to calcareous downland, locally on sandy heaths. Widespread and locally common in southern England, becoming rarer northwards; not recorded from Ireland. 1–3, 6, 7, 9–11, 15–17, 20, 22–24, 26–29, 32–34, 36, 37, 39, 41, 42, 45, 47, 49, 51, 55, 57, 59, 60, 62, 65, 68–71, 82, 90, 95, 96, 101, 108, S. (47, S). Native.
Central Europe, extending westwards to Britain and northwards to southern Fennoscandia. Be, Br, Da, Fe, Ga, Ge, He, Ho, It, Ju, No, Su.

The diagnostic features of *T. rubicundum* include the glabrous scapes (particularly just below the involucre), the erect, ovate exterior bracts and the dark

violet achenes. However, the whole plant has a most distinctive appearance. It is a most attractive species and one of the easiest to identify.

5. T. austriacum van Soest, *Proc. K. ned. Akad. Wet.*, ser. C, **69**(4):434 (1966)

A small and delicate plant. Leaves 30–80mm, dull green; leaf-lobes 4–7, variable, distant, often obtuse and recurved, entire or slightly dentate; petiole dark purple, unwinged; *persistent dark leaf-bases conspicuous*. Scapes 50–80mm, many, thin, wiry, rarely coloured, slightly arachnoid below capitulum; *exterior bracts 4 × 1mm*, spreading (to erect), *pale green*, corniculate, scarcely bordered; capitulum 15–20mm, pale yellow; ligules striped violet; styles exserted, dark, nearly black, pollen present. *Achenes 2·5mm, dark violet purple; cone 1·3mm.* $2n = 16^*$, 24. Sexual or facultative agamosperm. **Fig. 2.**

Clinker path by dock, Haverton Hill, Co. Durham. 66. (1). Almost certainly introduced.
Central Europe. Au, (Br), Cz, Ge, Hu, It, Ju.

This species resembles 4. *T. rubicundum*, of which it may be a sexual ancester, but it differs in leaf morphology, in having scapes which are hairy below the involucre (at least in bud), and very long cones to the achenes.

6. T. silesiacum Dahlst. ex Hagl., *Bot. Not.*, **1938**:500 (1938)

T. silesiacum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**:629 (1929), *nomen nudum*
T. silesianum Dahlst. ex Druce, *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**:124 (1930), *nomen nudum*

Leaves 30–100mm, *pure green*; leaf-lobes 4–5, crowded, slightly recurved, mostly entire, distal margin convex; *terminal lobe rounded*; petiole short, purple, winged. Scapes 30–120mm, arachnoid when young; exterior bracts 6 × 2mm, erect-spreading, green, slightly corniculate, scarcely bordered; capitulum 30mm, yellow; ligules striped purple; styles exserted, discoloured, pollen always absent. *Achenes 3·2mm, dark red*; cone 1·0mm. $2n = 24$. Obligate agamosperm. **Fig. 2.**

Dry calcareous grassland. Local, and confined to southern England, Wales and Co. Galway. 17, 22, 23, 27, 36, 41, 42, 49, 55, H15. (9, H1). Native.
North-west and central Europe extending northwards to southern Sweden. Au, Br, Cz, Da, Ga, Ge, Hb, He, Ho, Hu, It, Po, Rm, Su.

This pretty little species is best recognised by its distinctive, bright green leaves and rather large, dark red achenes.

7. T. commixtum Hagl. in Hylander, *Förteckn. Skand. Växter* (*Lund Bot. För.*), 156 (1941)

T. commutatum Dahlst. in Lindman, *Svensk Fanerogamfl.*, 573 (1918), *pro parte, non* Jordan, *Pug. Pl. Nov.*, 116 (1852)
T. commixtum Hagl. in Holmgren, *Blekinges Flora*, 323 (1942)

Leaves 70–200mm, dull green; leaf-lobes pointing forward, patent or recurved, *linear, often swollen at apex or bifurcate*; interlobes with lobules and long teeth; petiole purple, unwinged. Scapes 150–250mm, rather stout, ascending to erect, often suffused purple, arachnoid; *exterior bracts 8–10mm, erect, dark green,* neither obviously corniculate nor bordered; capitulum 40mm, deep yellow; ligules striped reddish-purple; styles exserted, *yellow*, pollen present. *Achenes 3·5mm, dark red*; cone 1·0mm. **Fig. 2.**

Sandy heaths; known only from Jersey, three stations in southern England and one in Northumberland. 22, 25, 29, 68, S. (4, S). Probably native.
Southern Scandinavia, around the North Sea and into the English Channel. Br, Da, Ga, Ge, Ho, Su.

This is a robust species with characteristic laciniate leaves and large achenes and bracts.

8. T. disseminatum Hagl., *Svensk bot. Tidskr.*, **41**:85 (1947)

Leaves 50–150mm, rather pale green, almost glabrous; *leaf-lobes 2–3, long, triangular, with large teeth on distal margin*; petiole dark violet, unwinged. Scapes 100–200mm, erect, rarely coloured, arachnoid below the capitulum; exterior bracts 6 × 2mm, recurved, slightly corniculate, clearly bordered; capitulum 30mm, pale yellow; ligules striped grey-violet; styles exserted, *blackish*, pollen present. *Achenes 3·2mm, chestnut*; cone 0·8mm. $2n = 24$. Obligate agamosperm. **Fig. 2.**

Short dry grassland. Surrey and Glamorgan. 17, 41. (2). Probably introduced.
From Scandinavia and England southwards to central Europe. Au, (Br), Da, Fe, Ga, Ge, He, Ho, No, Su.

The leaves, blackish styles and chestnut achenes of this species are all quite distinctive.

9. T. glaucinum Dahlst., *Bot. Not.*, **1909**:177 (1909)

Leaves 80–200mm; *pale glaucous green*; leaf-lobes pointing forward, patent or recurved, linear; interlobes with many lobules and teeth; petiole reddish, winged. Scapes 150–300mm, erect, green, arachnoid; exterior bracts 9 × 2mm, erect, *pale glaucous-green, with a clear white border*; capitulum 40mm, pale yellow; ligules *striped red*; styles exserted, discoloured, pollen present. Achenes 3·0mm, red; cone 1·0mm. **Fig. 3.**

Sand-dunes in Lancashire. 59, 60. (2). Probably native.
Local in southern Fennoscandia, England and Germany. Br, Fe, Ge, Su.

This is the only large, glaucous Erythrosperma species with laciniate leaves.

10. T. hispanicum H. Lindb. f., *Acta Soc. Sci. fenn.*, nov. ser. B, **1** (2): 171(1932)

T. vachellii Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1932*, **10**:26 (1933)

Leaves 100–150mm, yellow-green, almost glabrous; leaf-lobes 3–4, *triangular-deltoid, entire*; petiole reddish, winged. Scapes 150–220mm, not coloured, *glabrous*; exterior bracts 7 × 2mm, erect, *dark glaucous green, neither corniculate nor bordered*; capitulum 30mm, yellow; ligules striped purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, red; cone 1·0mm. **Fig. 3.**

Habitat uncertain, but probably dry rocky places in partial shade. Devon, Brecon and Westmorland. 3, 42, 69. (3). Native.
England, Wales and Spain. Br, Hs.

The leaves and exterior bracts of this apparently Lusitanian species serve to distinguish it from all others.

11. T. gotlandicum (Dahlst.) Dahlst., *Bot. Not.*, **1909**:171 (1909)

T. erythrospermum subsp. *gotlandicum* Dahlst., *Bot. Not.*, **1905**: 169 (1905)

Leaves 50–100mm, mid-green; leaf-lobes 4–6, patent, short, often obtuse, usually entire, distal margin concave; *petiole usually green*, winged or unwinged. Scapes rather many, 80–150mm, decumbent to erect, not coloured, arachnoid; exterior bracts 7 × 2mm, erect, glaucous, suffused violet, bordered; capitulum 30mm, pale yellow; ligules striped violet; styles exserted, *yellow*, pollen present. Achenes 3·0mm, *brick-red*; cone 0·8mm. **Fig. 3.**

Dry, rocky places. Angus and Banff. 90, 94. (2). First recorded by Miss M. McCallum Webster in 1967, since when it has been found in a further 5 localities. Probably native.
Scotland, the Oslofjord, the south-east coast of Sweden, Öland, Gotland and Estonia. Br, No, Rs(B), Su.

This species has a most interesting disjunct distribution. Before the Scottish localities were known it was considered by Wendelbo (1959) to be a thermophilous pre-boreal relict. With the exception of 13. *T. laetiforme*, which, however, lacks pollen, *T. gotlandicum* is the only species with green petioles, yellow styles and red achenes. It has a most distinctive leaf shape.

12. T. laetum (Dahlst.) Dahlst. in Sernander *et alia*, *Bot. Studier till. F. R. Kjellman*, 183 (1906)

T. erythrospermum subsp. *laetum* Dahlst., *Bot. Not.*, **1905**:169 (1905)
T. laetum (Dahlst.) Dahlst. in Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 257 (1906)

Leaves numerous, 50–100mm, mid-green; *leaf-lobes 5–8*, regular, recurved, *narrow, acute*; petiole usually green, unwinged. Scapes many, 50–100mm,

green, arachnoid above; exterior bracts 6 × 2mm, erect, pale green, with a purple corniculation, bordered; capitulum 30mm, pale yellow; ligules striped violet or grey; *styles exserted, yellow*, pollen present. Achenes 2·5mm, *dark violet*; cone 0·8mm. **Fig. 3.**

Sand-dunes and sandy grassland; rarely in calcareous grassland, local. 1, 3, 13, 22, 24, 27, 29, 41, 45, 46, 48, 52, 55, 57, 60, 66, 74, 85, 90, 94, 96, 101, 107, S. (23, S). Native.
Britain, southern Fennoscandia and the Russian Baltic coast. Br, Da, Fe, No, Rs(B), Su.

The green petioles and yellow styles distinguish this species from all except 11. *T. gotlandicum* and 13. *T. laetiforme*. The latter two both have reddish achenes and *T. laetiforme* also lacks pollen.

13. T. laetiforme Dahlst., *Bot. Not.*, **1909**: 174 (1909)

T. agauriforme Saarsoo, *ined., nom. in herb.*

Leaves 40–80mm, mid-green; leaf-lobes 5–8, ± recurved, short, acute or obtuse; *petiole usually colourless*, unwinged. Scapes 50–100mm, colourless, arachnoid above; *exterior bracts 7 × 1mm, recurved*, with a purple corniculation, *bordered*; capitulum 30mm, pale yellow; ligules striped violet; styles exserted, *pale yellowish or greyish*, pollen present. *Achenes 2·7mm, reddish*; cone 0·7mm. **Fig. 4.**

Sand-dunes and dry rocks. Norfolk, Derbyshire, Moray and Kintyre. 28, 57, 95, 101. (4). Doubtfully native.
Scattered in northern and north-west Europe. (Br), Da, Ga, Ho, No, Su.

Superficially similar to 12. *T. laetum*, this species differs in its long, narrow, recurved exterior bracts and red achenes.

14. T. dunense van Soest, *Acta bot. neerl.*, **5**: 95 (1956)

Leaves 50–120mm, dark green, *often purplish*; leaf-lobes 5–10, patent, *linear*; interlobes straight, very narrow, often with lobules and teeth; petiole very narrow, dark violet-purple, unwinged. Scapes 50–150mm, decumbent to erect, purplish, arachnoid; exterior bracts 7 × 2mm, spreading, green, corniculate, scarcely bordered; capitulum 30mm, deep yellow; ligules striped purple; styles exserted, discoloured, pollen present. *Achenes 3·5mm, dark violet*; cone 1·2mm. $2n = 24$. **Fig. 4.**

Sand-dunes, extending north to Anglesey in the west and Angus in the east. 14–16, 34, 41, 45, 52, 66, 67, 90. (10). Native.
Britain, Belgium, the Netherlands and southern Sweden. Be, Br, Ho, Su.

T. dunense is a most distinctive species with very narrow leaf-lobes and midribs and large, violet achenes.

SPECIES WITH CINNAMON* ACHENES (NOS. 15–19)

15. T. fulvum Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 258 (1906)

Leaves 50–180mm, dull green; leaf-lobes 4–7, recurved, acute, usually filiform-dentate; interlobes dentate; petiole dull purple, winged. Scapes 60–200mm, erect, arachnoid; *exterior bracts 5 × 1mm, recurved*, dull green, neither corniculate nor bordered; capitulum 35mm, deep yellow; ligules striped grey-violet; styles exserted, discoloured, *pollen absent. Achenes 3·0mm, cinnamon*; cone 0·7mm. $2n = 32$*. Obligate agamosperm. **Fig. 4.**

Dry grassland, occurring in more closed communities than is usual in this section. Locally frequent; not recorded from Ireland. 1, 2, 6, 7, 9, 10, 12–24, 26, 28, 29, 31, 32, 37, 39, 41, 49, 53–55, 57, 60, 62, 64, 67–69, 79, 80, 90, 96, 98, 101, 110, S. (45, S). Native.
Northern Europe extending southwards to Czechoslovakia; widespread and locally common in Scandinavia, occurring further north than the other members of this section. Br, Cz, Da, Fe, Ga, No, Rs (B, N), Su.

Not one of the more attractive members of this section, *T. fulvum* is characterised by its narrow, recurved exterior bracts, absence of pollen and cinnamon achenes. The differences between this species and 18. *T. retzii* are given under the latter.

16. T. fulviforme Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 775 (1923)

Leaves 40–100mm, dull green; leaf-lobes 4–5, recurved, dentate; petiole dull purple, narrowly winged. Scapes 60–150mm, erect, not coloured, arachnoid above; *exterior bracts 7 × 2mm, erect*, dark green, scarcely corniculate or bordered; capitulum 25mm, mid-yellow; ligules striped grey-violet; styles exserted, discoloured, *pollen absent. Achenes 3·0mm, cinnamon*; cone 0·8mm. $2n = 32$*. Obligate agamosperm. **Fig. 4.**

Dry places, especially sand-dunes, cliff-tops and calcareous grassland. Also in paths and lawns. Throughout Britain, but scarce in the north and east; not recorded from Ireland. 1, 3, 6, 7, 10, 13, 14, 16, 17, 22, 23, 30, 31, 35, 37, 39, 41, 42, 45, 48, 49, 52, 54, 55, 57, 59, 60, 67, 74, 90, 96, 98, 101, 110, S. (34, S). Native.
Britain, France and Belgium. Be, Br, Ga.

Well-grown forms have a distinctive leaf-shape; smaller forms from cliff-tops are confusing, especially when growing with 15. *T. fulvum* and 17. *T. oxoniense*, as in Pembrokeshire. It is, however, clearly differentiated as the only cinnamon-fruited species lacking pollen and with erect exterior bracts.

* see note p. 11.

17. T. oxoniense Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 776 (1923)

T. aloniense Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1924*, **7**: 441 (1925), *nomen nudum*
T. helvicarpum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 619 (1929)
T. neglectum Hagl., *ined., nom. in herb., non* Nakai & Koidzumi, *Bot. Mag. Tokyo*, **50**: 145 (1936)
T. neoneglectum van Soest, *ined., nom. in herb.*

Leaves 30–250mm, pure green; leaf-lobes irregular, patent, narrow, acute; terminal lobe often long, subdivided; interlobes with teeth and lobules; petiole narrow, bright purple. Scapes 50–280mm, decumbent to erect, purplish, glabrous; *exterior bracts 7 × 2mm, erect, dark green,* scarcely corniculate, with a *white border,* capitulum 30mm, mid-yellow; ligules striped grey-violet; styles exserted, *yellowish,* pollen present. *Achenes 3·0mm, cinnamon*; cone 1·0mm. $2n = 32$*. Obligate agamosperm. **Fig. 5.**

Dry neutral or calcareous ground, especially downland and sand-dunes. Widespread and locally common in England and Wales; local in Scotland. 1, 3, 5–7, 9–15, 17, 20, 22–30, 32–39, 41–50, 52, 53, 55, 57–62, 64, 66–71, 75, 82, 100, 101, 107, H9, S. (62, H1, S). Native.
North-west Europe. Be, Br, Ga, Hb, Ho, No.

This is the commonest member of the section in England and Wales. The leaf-morphology, although varying from highly dissected to almost entire, is nevertheless characteristic, especially in combination with the bright green colour of the leaves, and the bright purple of the petioles. The erect, dark green, white-bordered exterior bracts are also distinctive. This is also the only cinnamon-fruited species with erect bracts possessing pollen.

18. T. retzii van Soest, *Acta bot. neerl.*, **10**: 290 (1961)

Leaves 80–250mm, dull green; *leaf-lobes 4–7, slightly recurved, very long,* dentate, often on both margins; petiole dull reddish, unwinged or winged. Scapes 100–300mm, greenish, arachnoid above; *exterior bracts 9–10mm, recurved,* green, neither corniculate nor bordered; capitulum 35mm, yellow; ligules striped grey-violet; styles exserted, discoloured, pollen absent. *Achenes 3·5mm, cinnamon; cone 1·2mm.* **Fig. 5.**

Acid sandy heaths in southern England, very local. 20, 22, 28, 29, S. (4, S). Native.
England, France and Italy. Br, Ga, It.

The leaf-shape and the large achenes serve to separate *T. retzii* from 15. *T. fulvum.*

19. T. glauciniforme Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 620 (1929)

Leaves 40–200mm, narrowly oblong, *pale green, shortly laciniate*; leaf-lobes 8–12, patent, short, acute; interlobes with many short lobules and teeth; petiole usually green, winged. Scapes 20–100mm, erect, green, arachnoid; exterior bracts 7 × 2mm, recurved, green, slightly corniculate, unbordered; capitulum 30mm, pale yellow; ligules striped pale grey; styles exserted, discoloured, *pollen absent. Achenes 2·5mm, cinnamon*; cone 0·8mm. **Fig. 5.**

Dry calcareous downland; also not infrequently on paths, walls and in gardens. Widespread and locally common in England and Wales, also recorded from Ayrshire and Co. Galway. 1, 6, 11, 14, 16, 17, 22–24, 28–30, 33, 41, 47, 55, 59, 66, 75, H16, S. (19, H1, S). Native.
British Isles, Belgium and France. Be, Br, Ga, Hb.

This most characteristic species is instantly recognised by its leaf-shape and distinguished from small forms of 9. *T. glaucinum* by the cinnamon achenes.

SPECIES WITH DARK-BROWN ACHENES (NO. 20)

20. T. proximum (Dahlst.) Dahlst. in Sernander *et alia, Bot. Studier till. F. R. Kjellman*, 183 (1906)

T. erythrospermum subsp. *proximum* Dahlst., *Bot. Not.*, **1905**: 105 (1905)
T. proximum (Dahlst.) Dahlst. in Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 257 (1906)
T. praevnum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 28 (1930), *nomen nudum*

Leaves 50–200mm, dull green; leaf-lobes 5–8, triangular, acute, dentate; petiole dull purple, winged. Scapes 60–250mm, erect, green, arachnoid; exterior bracts 8 × 2mm, erect, dark green, slightly corniculate, scarcely bordered; capitulum 35mm, convex, deep yellow; ligules striped purple; styles exserted, discoloured, *pollen absent. Achenes 2·8mm, dark brown to purple-brown (puce)*; cone 0·8mm. $2n = 24$*. Obligate agamosperm. **Fig. 5.**

Dry grassland and meadows, local. 1, 6, 26, 28, 47, 58, 59, 62, 65–68, 75, 78, 83, 95, 103, 108. (18). Native.
Europe, except the Arctic, Alpine and Mediterranean regions. Be, Br, Cz, Da, Fe, Ga, Ge, Hb, He, Ho, No, Rs (B, C, W), Su.

T. proximum is characterised by the absence of pollen, the distinctively shaped leaves and the unique colour of the achenes among British species.

SPECIES WITH PALE BROWN, GREY-BROWN, STRAW-BROWN OR STRAW-COLOURED ACHENES (NOS. 21–27)

21. T. simile Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 257 (1906)

Leaves 40–100mm, *pale green*; leaf-lobes 3–5, recurved, acute, dentate; petiole green, unwinged. Scapes 60–150mm, erect, green, arachnoid; *exterior bracts 7 × 2mm, recurved*, green, shortly corniculate, unbordered; capitulum 30mm, yellow; ligules striped dark violet; styles exserted, discoloured, *pollen absent. Achenes 2·8mm, straw-brown*; cone 0·7mm. $2n = 32$*. Obligate agamosperm. **Fig. 6.**

Rock-crevices, walls, paths etc., mostly on silicious rocks. Local, absent from Ireland. 9, 14, 17, 20, 22–24, 27, 29, 34–36, 38, 44, 48, 55, 57, 67, 82, 101, 108, S. (21, S). Native.
North-west Europe and Sweden; scattered. Br, Da, Ga, Ho, No, Su.

Of the brown-fruited species, *T. simile* is characterised by recurved exterior bracts and absence of pollen.

22. T. acutum A. J. Richards, **sp. nov.** (see p. 96)

Leaves 30–60mm, *dark green*; leaf-lobes 4–5, *recurved*, acute, with one or several teeth; petiole green or purple, unwinged. Scapes 50–100mm, ascending-erect, narrow, green, arachnoid; *exterior bracts 6–7mm, spreading, dark green*, neither corniculate nor bordered; capitulum convex, deep yellow; ligules striped dark violet; styles exserted, discoloured, *pollen present.* Achenes 3·0mm, *straw-brown*; cone 0·7mm. **Fig. 6.**

Short calcareous turf in Hertfordshire and Norfolk. 20, 28. (2). Endemic.

T. acutum is closest to 21. *T. simile* but is readily distinguished by the dark, strongly recurved leaf-lobes and erect exterior bracts.

23. T. degelii Hagl., *Bot. Not.*, **1935**: 430 (1935)

Leaves 30–100mm, pale green; leaf-lobes variable, triangular-acute, or ± linear, almost entire; terminal lobe rounded or tripartite; petiole rose-coloured, unwinged or winged. Scapes 50–150mm, erect, green, arachnoid; *exterior bracts 8–9mm, erect*, slightly corniculate, *with a conspicuous white or rose-coloured border*; capitulum 30mm, pale yellow; ligules striped grey; styles exserted, discoloured, pollen present or *absent. Achenes 3·0mm, grey-brown; cone 1·3mm.* **Fig. 6.**

Rocky places, usually near the sea. Mid-Wales, Kintyre, western Ireland. 42, 43, 101, H9, 16, 27. (3, H3). Endemic.

This species is best identified by the wide white borders of the pale green exterior bracts.

24. T. placidum A. J. Richards, **sp. nov.** (see p. 96)

Leaves 60–200mm, narrow, pale green; leaf-lobes 5–8, *short, deltoid, entire* or

denticulate; petiole long, *bright purple*, narrowly winged. Scapes 100–300mm, erect, purple, arachnoid above; *exterior bracts 7×3mm*, patent, corniculate, with a white border; *involucre narrow; capitulum 40–50mm*, mid yellow; ligules striped silver-grey; styles exserted, *yellow*, pollen present. *Achenes 3·5mm, grey-brown*; cone 0·8mm. $2n = 24$*. Obligate agamosperm. **Fig. 6.**

Dry grassy paths near St Annes, Alderney. S. Native.
Channel Isles, central France and northern Spain. Br, Ga, Hs.

This very distinctive species bears little resemblance to other species in this or any other section. The narrow, pale leaves with vivid petiole and mid-rib and short, deltoid leaf-lobes, the narrow involucres, large capitula with yellow polliniferous styles and large achenes are all characteristic.

25. T. pseudolacistophyllum van Soest, *Bull. Jard. bot. État Brux.*, **26**: 228 (1956)

T. affine Hagl., *Ber. schweiz. bot. Ges.*, **60**: 233 (1950), *non* Jordan, *Pug. Fl. Nov.*, 113 (1852)

Leaves 40–100mm, dark, *often suffused purple*; leaf-lobes 5–10, patent, pointing forward or recurved, *linear*; interlobes with lobules and teeth; petiole deep purple, unwinged. Scapes 50–120mm, ascending, purplish, especially below, arachnoid; *exterior bracts 7×2mm, erect, dark, suffused purple*, neither corniculate nor bordered; capitulum 30mm, convex, deep yellow; ligules striped purple; styles exserted, discoloured, pollen present. *Achenes 3·0mm, straw-brown*; cone 0·8mm. $2n = 32$*. Obligate agamosperm. **Fig. 7.**

Dry grassland and sand-dunes; local and chiefly in southern and western England. 3, 15, 16, 27, 39, 41, 44, 55, 57, 58, 70, 82, 101, 103. (14). Native.
North-west and central Europe; local. Au, Be, Br, Ga, Ge, He, Ho, It.

Of the brown-fruited species, *T. pseudolacistophyllum* is distinguished by its purplish colour, narrow, more or less laciniate leaves, the erect, dark purplish, unbordered bracts and the presence of pollen.

26. T. canulum Hagl. in Marklund, *Acta bot. fenn.*, **26**: 134 (1940)

Leaves 50–150mm, *grey-green, laciniate*; leaf-lobes pointing forward, patent or recurved, *linear*; interlobes with lobules and teeth; petiole purple, unwinged. Scapes 40–100mm, ascending, green, arachnoid; *exterior bracts 7×2mm, spreading*, green, shortly corniculate and slightly bordered; capitulum 30mm, mid-yellow; ligules striped grey-violet; styles exserted, discoloured, *pollen absent. Achenes 3·5mm, warm straw-brown*; cone 1·0mm. **Fig. 7.**

Dry grassland in southern and central England; scattered. 16, 24, 29, 55. (4). Probably introduced.
England, Belgium, Sweden and Finland. (Be, Br), Fe, Su.

This species has been considered a form of, or identical with, *T. falcatum* Brenner (Lundevall 1962, Saarsoo & Haglund 1962). Van Soest (1966) suggests that the stigmas are greyer and the achenes more yellow-brown. I agree with him. Further, comparison in the field of the two taxa on Åland, Finland, where both are frequent, suggests that the leaves are more grey-green, and that the leaf-shape is different. Of the brown-fruited British species, *T. canulum* is unique in its greyish, laciniate leaves.

27. T. proximiforme van Soest in Lambinon & van Soest, *Lejeunia*, nov. ser., **8**: 2 (1962)

Leaves 50–250mm, dull green; leaf-lobes 3–6, slightly recurved; petiole winged, dull purple. Scapes 80–250mm, erect, arachnoid; exterior bracts 8 × 2mm, spreading, green, scarcely corniculate or bordered; capitulum 30mm, flat or convex, mid-yellow; ligules striped grey-violet; styles exserted, *yellow*, *pollen present*. *Achenes 3·0mm*, *straw-brown*; cone 0·8mm. $2n = 24$*. Obligate agamosperm. **Fig. 7.**

Dry grassland on Magnesian Limestone; two localities in Co. Durham. 66. (1). Native.
England, the Channel coasts of France, Belgium and the Netherlands. Be, Br, Ga, Ho.

T. proximiforme is very similar to 20. *T. proximum* but has yellow styles, pollen and straw-brown achenes.

Section Obliqua

Section **OBLIQUA** Dahlst., *Acta Flor. Suec.*, **1**: 142 (1921)

Plants small. Leaves many, narrowly oblong, highly dissected, never spotted. Scapes exceeding leaves, coloured, nearly glabrous; exterior bracts ovate-lanceolate, adpressed or erect, corniculate, bordered; capitulum flat, or almost closed, deep or orange-yellow; ligules striped red; styles discoloured, pollen present. Achenes 3mm, grey-brown, with a short (0·4mm) conical cone. $2n=24$. Obligate agamosperms. Flowering May.

Plants of open sandy turf by the sea, especially 'machair'. Local and confined to the coasts of Britain, Belgium, the Netherlands and Scandinavia. Be, Br, Da, Ho, No, Su. There are only two species, both of which occur in Britain.

Although superficially similar to certain species of the section Erythrosperma (especially 12. *T. laetum* and 13. *T. laetiforme*), from which they may only be distinguished with certainty by the achenes, they are perhaps more closely related to the high-alpine section Dissecta van Soest, from which they may have become differentiated in late-glacial times in response to maritime conditions. The small size, many-lobed leaves, almost orange heads and shortly coned, greyish achenes are all very distinctive. All previous records of this section from Britain are erroneous, while most of the records of *T. obliquum* from central Europe usually refer to brown-fruited Erythrosperma species, never to *T. obliquum*.

28. T. obliquum (Fries) Dahlst., *Bot Not.*, **1905**: 164 (1905)

Leontodon obliquum Fries, *Nov. Fl. Suec.*, **1**: 14 (1814)

Leaves 30–80mm, *pale green*; leaf-lobes 7–10, *patent*, short, *obtuse*, scarcely dentate; petiole green, winged. Scapes many, 20–100mm, slender, green, glabrous; exterior bracts 6×2mm, adpressed, with a purple corniculation and pale border; *capitulum orange-yellow*, usually closed; *ligules involute, striped red*; styles ± exserted, pollen present. *Achenes 3·0mm, grey-brown; cone 0·4mm, conical.* $2n = 24$. Obligate agamosperm. **Fig. 7.**

Dune-slacks and grey-dunes. Coasts of northern and western Scotland. 95, 101-103, 106, 107. (6). Native.
Scotland and Scandinavia. Br, Da, No, Su.

29. *T. platyglossum* has darker leaves, more acute, dentate leaf-lobes and a usually flat, deep yellow capitulum.

29. T. platyglossum Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 256 (1906)

Leaves 30–120mm, *dark green*; leaf-lobes 7–12, *recurved, acute*, filiform-dentate; petiole green, winged. Scapes many, 20–100mm, slender, often coloured, glabrous; exterior bracts 7 × 2mm, erect-adpressed, green, with a purple or green corniculation and pale border; capitulum 25–30mm, *usually flat*, sometimes closed, *deep yellow*; ligules *usually flat*, sometimes involute, striped red; *styles exserted*, yellow, pollen present. *Achenes 3·0mm, grey-brown; cone 0·4mm.* **Fig. 8.**

Sand-dunes. Scottish coasts; isolated localities in the Isle of Man, Anglesey, Somerset and Guernsey. Commoner and more widespread than the preceding species. 6, 52, 71, 75, 81, 82, 90, 94–96, 101, 103, 108, S. (13, S). Native. Britain, southern Sweden and North Sea coasts. Be, Br, Da, Ho, No, Su.

The differences from the preceding species are mentioned under the latter; 12. *T. laetum* is very similar in many aspects but has quite different achenes.

32. T. anglicum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1919*, **5**: 567 (1920)

Leaves 60–200mm, erect, dull green, smooth, *lobate*; leaf-lobes 2–3, short, acute, *sagittate*, entire; *petiole vivid purple*, unwinged. Scapes 50–200mm, erect, greenish, glabrous; *exterior bracts 7 × 3mm, adpressed, ovate, dark green, with a white border;* capitulum 40mm, flat, deep yellow; ligules flat, striped leaden-grey; stigmas exserted, discoloured, *pollen present. Achenes 3·5mm, straw-brown*, spinulose above; cone 0·8mm. **Fig. 8.**

Very local but frequent in hay-meadows liable to seasonal flooding. Cambridgeshire, Huntingdonshire, Surrey, Oxfordshire and Berkshire; extinct in Buckinghamshire. 17, 22, 23, (24), 29, 31. (6). Native.
England, the Netherlands, Germany and Switzerland. Br, Ge, Ho, He.

Although often placed in the Spectabilia, the smooth, slender leaves, and ovate, tightly adpressed exterior bracts seem to point unequivocally to this section. The lobate leaves and presence of pollen are diagnostic.

Section Spectabilia

Section **SPECTABILIA** Dahlst., *K. svenska VetenskAkad. Handl.*, ser. 3, **9**(2): 5 (1930)

Section *Crocea* M.P. Chr., *Bot. Iceland*, **3**(3): 255 (1942)
Section *Euspectabilia* M.P. Chr., *Bot. Iceland*, **3**(3): 292 (1942)
Section *Naevosa* M.P. Chr., *Bot. Iceland*, **3**(3): 303 (1942)
Section *Macrodonta* M.P. Chr., *Bot. Iceland*, **3**(3): 318 (1942)

Plants usually medium-sized. Leaves rarely linear or highly dissected, often dark, hairy and spotted; petiole and mid-rib often purple. Scapes arachnoid; exterior bracts not exceeding 10mm, spreading to adpressed, usually ovate-lanceolate, never corniculate or with a broad or very distinct border; capitulum 30–50mm, usually flat; ligules nearly always flat, often striped purple or carmine; styles usually exserted, usually discoloured, pollen often absent. Achenes 3·5–5·0mm, sometimes oblong, straw or brown-coloured, often scarcely spinulose; cone not exceeding 1·0mm, conical, short; rostrum 5–10mm, often thick. $2n = 24^*$, 32^*, 40^*, 48^*. Obligate agamosperms. Flowering May–July.

Wet places, especially in upland Britain. A markedly Atlantic section, restricted to western Europe and Greenland, and showing the greatest diversity in Norway, Iceland and Scotland. Br, Da, Fa, Fe, Hb, Ho, Hs, Is, Lu, No, Rs(N), Sb, Su. 61. *T. nordstedtii* and 64. *T. adamii* occur also in Be, Ga and Ge.

This is a heterogeneous section most species of which can be divided into:—

a. Nos. 59–65, lowland triploids and hexaploids, with smooth, unspotted, leaves and small dark achenes. These have perhaps arisen from hybridisation between the sections Vulgaria and Palustria.
b. Nos. 36–40, upland pentaploids (Section Euspectabilia *sensu* Christiansen), with dark, spotted leaves, adpressed exterior bracts and large, oblong, straw-coloured achenes. These are of uncertain origin.
c. Nos. 41–51, upland tetraploids (Section Naevosa *sensu* Christiansen), with dark, spotted leaves but with spreading bracts and smaller, top-shaped achenes. These may have arisen from hybridisation between the sections Vulgaria and Euspectabilia.
d. Nos. 52–57, arctic tetraploids (Section Crocea *sensu* Christiansen), with pale leaves with green petioles, deep yellow capitula, and spreading exterior bracts. These may have arisen from either the sections Alpina Hagl. or Fontana van Soest, or as a result of hybridisation between these and species of the Vulgaria.

However, there are intermediates between all these groups and although they are very convenient subdivisions of this very large section they are not discrete enough for formal use.

SPECIES WITH REDDISH ACHENES (NOS. 33 AND 34)

33. T. unguilobum Dahlst., *Ark. Bot.*, **12**(2): 57 (1912)

Leaves 50–200mm, often *yellow-green*, unspotted; leaf-lobes 4–6, *strongly recurved, filiform-dentate; petiole pink*, winged or unwinged. Scapes 50–300mm, decumbent to erect, green or pink; *exterior bracts 8 × 2mm, spreading-erect, pale glaucous-green above, darker below, pink-tipped, with a white border*; capitulum 35mm, *pale yellow*; ligules striped pink; *styles inserted, yellow, pollen absent. Achenes 3·2mm, rust-coloured*, slightly spinulose above; cone 0·5mm, conical. $2n = 32$*. Obligate agamosperm. **Fig. 9.**

Wet paths, rock-faces, roadsides and flushes in hilly districts. Common in the north and west; rare and perhaps introduced in the south and east. 1, 3, 6, 23, 26, 39, 42, 44, 48–50, 52, 64, 66–71, 73–75, 80, 83, 88, 90, 94–101, 103, 105, 108, 109, 111, 112, H1, 9, 16, 27. (40, H4). Native.
British Isles and Norway. Br, Hb, No.

This is perhaps the most distinctive species in the section. The highly recurved leaf-lobes, glaucous, pink-tipped and bordered exterior bracts and small, reddish achenes are all diagnostic. *T. unguilobum* has no obvious affinities to other species in the section, except for 34. *T. fulvicarpum*. It may be that they differ from the remainder in having members of the Erythrosperma in their ancestry.

34. T. fulvicarpum Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 420 (1927)

T. unguilobiforme Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1933*, **10**: 475 (1934)

Leaves 100–200mm, pale green, unspotted; leaf-lobes 3–5, recurved, narrow, *straight-sided, coarsely dentate*. Scapes 30–100mm, decumbent to erect; exterior bracts 9 × 2mm, spreading, green, *unbordered and with green tips*; capitulum 40mm, mid-yellow; ligules striped violet; *styles exserted, discoloured, pollen usually absent. Achenes 3·4mm, cinnamon*; cone 0·7mm, slender. $2n = 32$*. Obligate agamosperm. **Fig. 9.**

Ecologically very catholic, occurring in wet grassland, wood-borders and dune-slacks. Local; commonest in western Scotland. 3, 15, 42, 66, 67, 90, 94, 97, 99, 101, 103, 104, 106, 110–112. (16). Endemic.

T. fulvicarpum is best distinguished from the preceding by its coarsely dentate leaves and concolorous bracts. It is sometimes placed in the section Erythrosperma. Although the achenes are strongly reminiscent of some cinnamon-fruited species in that section (although larger) this species is coarser than any Erythrosperma species, and for that reason is placed here.

SPECIES WITH ERECT EXTERIOR BRACTS AND SMALL ACHENES (NO. 35)

35. T. landmarkii Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 14 (1925)

T. firmuliforme A. J. Richards, *Taxon*, **18**: 561 (1969), *nomen nudum*

Leaves 50–120mm, smooth, mid-green, unspotted; leaf-lobes 4–5, *patent, narrow, deltoid*, acute, entire; interlobes with lobules; petiole purple, unwinged. Scapes 100–200mm, erect, green; *exterior bracts 8 × 2mm, spreading-erect, dark green, suffused purple, unbordered; capitulum 35mm, convex, mid-yellow*; ligules striped purple; styles exserted, discoloured, pollen present or *absent*. Achenes 3·0mm, warm straw-brown, spinulose above; cone 0·6mm, rather narrow. $2n = 32$*. Obligate agamosperm. **Fig. 9.**

Stream-sides, ravines, wet cliffs, path-sides etc.; local, commonest in the Scottish Highlands. 15, 22, 23, 28, 29, 42, 55, 66–68, 71, 75, 88, 92, 96, 98, 99, 101, 103, 111, H1. (14, 20, H1). Native.
British Isles and Norway. Br, Hb, No.

T. landmarkii has rather pretty, distinctive leaves and very small achenes, similar to those of 49. *T. lainzii*, and indicating a relationship with the section Vulgaria.

SPECIES WITH ERECT EXTERIOR BRACTS, LARGE ACHENES AND DARK, SPOTTED LEAVES (EUSPECTABILIA) (NOS. 36–40)

36. T. faeroense (Dahlst). Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 12 (1925)

T. spectabile var. *faeroense* Dahlst. in Warming, *Bot. Faeröes*, **3**: 839 (1908)
T. subeximium M.P. Chr., *Bot. Iceland*, **3**(3): 294 (1942), *non* Dahlst., *ined., nom. in herb.*

Leaves 50–250mm, spathulate, rough, dark green, *often spotted*, lobed or *unlobed; leaf-lobes 2–3*, patent or slightly recurved, *broad*, acute; petiole purple. Scapes 20–200mm, often coloured; exterior bracts 8 × 2mm, *adpressed-erect*, dark green, scarcely bordered; capitulum 40mm, bright yellow; *ligules striped carmine*; styles exserted or ± *inserted, yellow, pollen absent. Achenes 4·0 × 1·1mm, straw-coloured*, scarcely spinulose above; cone 0·3mm, broad. $2n = 40$*. Obligate agamosperm. **Fig. 9.**

Wet places in hilly districts, often very common; less frequently on lowland heaths and roadsides where it is probably introduced. Ascends to 1,000m (3,300ft) in Scotland. Throughout Britain but rare in the south; Co. Kerry, 1, 3, 8, 11–14, 17, 22–24, 28, 29, 34, 35, 37–42, 44, 45, 47, 49, 52, 57–59, 61–72, 82, 83, 85, 87–90, 92, 94–101, 103–108, 110–112, H1. (66, H1). Native.
North-west Europe. Br, Da, Fa, Hb, Is, No, Su.

The dark, often spotted leaves with coloured petioles, adpressed exterior bracts, carmine ligules and large pale achenes distinguish this species from all except 37. *T. spectabile* and 38. *T. eximium*. It is best separated from the former by the few, more or less patent leaf-lobes, or entire leaves, and from the latter by the leaves, which are dull and frequently lobate, and the smaller capitula and achenes. It is the commonest upland British *Taraxacum* species.

37. T. spectabile Dahlst., *Bot. Not.*, **1905**: 159 (1905)

T. dilutiroseum M.P. Chr., *Bot. Iceland*, 3(3): 297 (1942)
T. crispifrons M.P. Chr., *Bot. Iceland*, 3(3): 299 (1942)
T. subspectabile M.P. Chr., *Bot. Iceland*, 3(3): 300 (1942)
T. cimbricum Wiinst. in Raunk., *Dansk Ekskurs.-Fl.*, 7th ed., 332 (1950), *sine diag. lat.; Bot. Tidsskr.*, **55**: 40 (1959)

Leaves 50–200mm, narrowly lanceolate, rough, dark green, *often spotted*, lobed; *leaf-lobes 4–8, recurved, rather narrow*, acute; petiole purple, usually winged, at least above. Scapes 20–150mm, often coloured; *exterior bracts* $8 \times 2mm$ (but very *variable*), adpressed-erect, dark green, scarcely bordered; capitulum 40mm, bright yellow; ligules striped carmine; *styles usually inserted, yellow, pollen absent. Achenes* $4{\cdot}3 \times 1{\cdot}0mm$, straw-coloured, scarcely spinulose above; cone 0·3mm, broad. $2n = 40$*. Obligate agamosperm. **Fig. 10.**

Less common in the north and more dependent on base-rich water than the preceding, also local in water-meadows etc. in the south. 11–14, 17, 22, 23, 28, 39, 41, 42, 44, 45, 49, 57, 58, 62, 65–67, 69, 76, 86, 88–91, 94–96, 98, 100, 101, 105–108, 112, H1, S. (38, H1, S). Native.
North-west Europe. Br, Da, Fa, Hb, Is, No, Su.

T. spectabile is distinguished from 36. *T. faeroense* by the more numerous and more recurved leaf-lobes.

38. T. eximium Dahlst., *Ark. Bot.*, **12**(2): 30 (1912)

Leaves 60–200mm, *spathulate, shining, dark green, rarely spotted,* ± *unlobed; petiole bright purple*, usually unwinged. Scapes 50–200mm, *purple; exterior bracts* $9 \times 3mm$, *adpressed-erect, dark green*, scarcely bordered; capitulum 50mm, dark yellow; ligules striped carmine; *styles exserted, yellow, pollen absent. Achenes* $5{\cdot}0 \times 1{\cdot}3mm$, straw-coloured, scarcely spinulose above; cone ± absent. **Fig. 10.**

Local, in wet acid places in the Scottish Highlands. 85, 90, 92, 94–96, 99, 103, 106, 108. (10). Native.
North-west Europe. Br, Is, No, Su.

The differences between this species and 36. *T. faeroense* are given under the latter.

39. T. reclinatum M.P. Chr., *Bot. Iceland*, 3(3): 293 (1942)

Leaves 50–200mm, rough, mid-green, *usually spotted*; leaf-lobes 4–6, broad, *distal margin sigmoid*; petiole purple, winged. Scapes 100–150mm, pale; *exterior bracts 9 × 2·5mm, erect*, stiff, *dull green*; capitulum 45mm, yellow; ligules striped purple; styles exserted, *discoloured, pollen absent. Achenes 4·0 × 1·3mm, broadly spinulose above;* cone 0·6mm. **Fig. 10.**

Habitat not known. Isle of Skye and Sutherland. 104, 108. (2). Native. Scotland, Iceland and Norway. Br, Is, No.

This is a distinctive species with large, erect exterior bracts and wide achenes with broad-based spinules. The leaves closely resemble those of 42. *T. eury-phyllum*, but have more strongly sigmoid lobe-margins. This Scottish plant agrees with Christiansen's description of the Icelandic species *T. reclinatum*, but it is not yet clear whether this can be regarded as the correct name. I have recently seen similar plants from Norway in Lundevall's collection at Stockholm.

40. T. acrifolium Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, 8: 621 (1929)

Leaves 80–200mm, *very narrowly lanceolate*, rough, dark green, *usually spotted*; *leaf-lobes 1–2*, slightly recurved, short, dentate; *terminal lobe very long and narrow, approximately ½ length of leaf*, entire; petiole dull purple, unwinged. Scapes 100–200mm, purplish; exterior bracts 9 × 2mm, erect, stiff, dark green, ± glaucous, scarcely bordered; capitulum 40mm, deep yellow; ligules striped purple; styles discoloured, *exserted, pollen present. Achenes 4·0mm, straw-brown*, spinulose at apex only; cone 0·5mm. **Fig. 11.**

Habitat not known. Kintyre and Shetland. 101, 112. (2). Native. Scotland and Denmark (Jylland). Br, Da.

The leaf-shape of this species is most distinctive.

SPECIES WITH DARK SPOTTED LEAVES AND SPREADING EXTERIOR BRACTS (NAEVOSA) (NOS. 41–51)

41. T. calophyllum Dahlst. in Johnston, *Addit. Fl. Orkney*, 13: 7 (1929)

Leaves 60–160mm, rough, dull green, often slightly spotted; leaf-lobes 4–6, slightly recurved, broad, *strongly dentate*; petiole dull purple, winged. Scapes 100–200mm, erect, pale; *exterior bracts 10 × 2·5mm, erect, green*, scarcely bordered; capitulum 45mm, yellow; ligules striped grey-purple; styles exserted, *yellow, pollen present.* Achene characters not known. **Fig. 11.**

Habitat not known. Orkney. 111. Endemic.

This is a distinctive species with very strongly dentate leaf-lobes. It could only be confused with 51. *T. laetifrons* but this has green petioles, spreading exterior bracts and discoloured styles. It has not been found since originally collected by Johnston from the Island of Hoy in 1929.

42. T. euryphyllum (Dahlst.) M.P. Chr., *Bot. Tidsskr.*, **45**: 154 (1940)

T. maculigerum subsp. *euryphyllum* Dahlst., *Ark. Bot.*, **10**(11): 31 (1911)

Leaves 50–150mm, rough, *pure green, spotted*; leaf-lobes 4–6, acuminate, *distal margin sigmoid*, scarcely dentate; petiole purple, *winged*. Scapes 80–200mm, erect, pale; exterior bracts 9 × 2·8mm, spreading, ± glaucous, with a narrow white border; capitulum 40mm, yellow; *ligules striped red-purple*; styles exserted, discoloured, pollen present or absent. Achenes 3·5–4·0mm, dark straw-coloured, spinulose above; cone 0·7mm, rather narrow. $2n = 32$*. Obligate agamosperm. **Fig. 11.**

In wet, rather sheltered, somewhat base-rich sites throughout Britain, but more frequent in the north. 23, 29, 39, 58, 59, 62, 66–68, 76, 77, 86, 90, 94, 98, 101, 103, 104, 107, 108, 111, 112. (22). Native.
Britain, Scandinavia and the Netherlands. Br, Da, Ho, No, Su.

T. euryphyllum is distinguished from 43. *T. maculigerum* by wider leaves, winged petioles, and longer cones to the achenes; from 39. *T. reclinatum* by less sinuate leaf-lobes, spreading exterior bracts and less densely spinulose achenes, and from 48. *T. drucei* by rougher, thicker leaves with ± acute terminal lobes. 46. *T. naevosiforme* has strongly recurved leaf-lobes, 50. *T. naevosum* very large capitula, and 45. *T. pseudolarssonii*, dark, shining leaves and longer, more acute, less sigmoid leaf-lobes.

43. T. maculigerum H. Lindb. f., *Acta Soc. Fauna Flora fenn*, **29**(9): 35 (1907)

Leaves 50–200mm, *narrow*, rough, *dull* or dark green, spotted; leaf-lobes 2–4, distant, patent or slightly recurved, short, acute; petiole dark purple, *unwinged*. Scapes 100–200mm, erect, pale; exterior bracts 8 × 2·5mm, spreading, dark green, somewhat glaucous, scarcely bordered; capitulum 40mm, yellow; ligules striped purple; styles exserted, discoloured, pollen present or absent. Achenes 3·5mm, straw-brown with rather few acute spinules above; cone 0·7mm, narrow. $2n = 32$*. Obligate agamosperm. **Fig. 11.**

Wet places in the north, especially wet wood-margins, cliff-faces etc.; not noticeably basicolous. Fairly common, perhaps introduced into the south-east. 1, 7, 11, 19, 23, 39, 41, 42, 44, 45, 52, 59, 60, 62, 64, 66–70, 77, 83, 85, 86, 88, 90, 92, 94–99, 101, 103, 105–108, 111, 112, H28, 39. (41, H2). Native.
British Isles and Fennoscandia. Br, Da, Fe, Hb, No, Su.

T. maculigerum occurs further east than any other member of this section, being 'Northern Continental' rather than 'Northern Atlantic' in distribution.

It is rather surprising therefore that it is fairly common in this country. It has narrower leaves and petioles than the other species with spotted leaves and spreading exterior bracts, except 40. *T. acrifolium* which has a very long, narrow terminal leaf-lobe and longer achenes.

44. T. praestans H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 24 (1907)

T. purpurinerve Dahlst., *Bot. Not.*, **1911**: 284 (1911), *nom. in syn.*
T. opeatolobum Dahlst. ex Lange, *Acta Bot. fenn.*, **21**: 160 (1938)

Leaves 50–170mm, smooth, mid-green, unspotted or spotted, sometimes heavily so; leaf-lobes 2–4, patent, narrow, slightly dentate; *terminal lobe rather long and relatively broad, subdissected; petiole bright purple, unwinged.* Scapes 80–200mm, erect, pale; exterior bracts 11 × 2·5mm, spreading, green, scarcely bordered; capitulum 45mm, yellow; ligules striped grey-violet; styles long-exserted, *yellow, pollen present.* Achenes 3·5mm, light brown, spinulose above; cone 0·6mm, narrow. $2n = 32$*. Obligate agamosperm. **Fig. 12.**

Wet places, especially beside roads and paths, and on wet cliffs; largely restricted to upland Britain, but not uncommon. 5, 12, 31, 45, 58–60, 66, 67, 69, 80, 88–90, 92–96, 98, 99, 101, 103, 106, 108, 110–112, H28. (28, H1). Native. British Isles and Fennoscandia. Br, Da, Fe, Hb, No, Su.

This is another rather eastern species, although less so than the preceding. *T. praestans* is well characterised by narrow, bright purple petioles and long, subdissected terminal leaf-lobes, as well as yellow styles, abundant pollen and rather dark achenes. Forms from western Scotland can be very heavily blotched indeed, with very little green showing. Forms from the east, however, are usually unspotted, as are Scandinavian plants. It seems that an east-west cline in leaf-spotting exists in this species, although this may not be under genetic control.

45. T. pseudolarssonii A. J. Richards, **sp. nov.** (see p. **96**)

Leaves 100–200mm, *rather smooth, shining, dark green, with red, purple or black spots*; leaf-lobes 3–5, *very regular, patent, narrow, acute, entire; petioles bright purple*, unwinged. Scapes 100–200mm, erect, pale; *exterior bracts 7 × 2mm*, spreading, green, scarcely bordered; capitulum 45mm, convex, deep yellow; ligules striped grey-violet; styles exserted, discoloured, *pollen present.* Achenes 3·5mm, straw-brown, spinulose; cone 0·5mm. $2n = 32$*. Obligate agamosperm. **Fig. 12.**

Calcareous flushes and stream banks. Lancashire and Co. Durham. 60, 66. (2). Endemic.

The leaf-colour and shape of this species are both distinctive.

46. T. naevosiforme Dahlst., *Ark. Bot.*, **12**(2): 49 (1912)

T. johnstonii Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 744 (1923)
T. plicatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1933*, **10**: 476 (1934)

Leaves 50–200mm, rough, *dark green, spotted*; *leaf-lobes 4–7, recurved*, distal margin convex, slightly dentate; petiole dull purple, narrowly winged. Scapes 60–200mm, erect, usually dull purple; exterior bracts 10 × 2·5mm, spreading, dark green, suffused purple and purple-tipped, scarcely bordered; capitulum 40mm, convex, deep yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·5mm, straw-brown, spinulose; cone 0·6mm. $2n = 32$*. Obligate agamosperm. **Fig. 12.**

Wet grassland, cliffs etc. Commonest in northern Scotland, becoming progressively scarcer southwards. 19, 49, 66, 67, 70, 83, 88–90, 94–99, 101, 103–106, 108, 110–112. H2, 28, 29. (24, H3). Native.
British Isles and Scandinavia. Br, Hb, No, Su.

This is the only species with spotted leaves and spreading bracts that has markedly recurved leaf-lobes.

47. T. subsimile Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 89 (1924)

Leaves 50–150mm, rough, mid-green, unspotted or with scattered small spots; *leaf-lobes 2–3, slightly recurved, long*, somewhat dentate; *petiole green*, winged. Scapes 50–100mm, ascending, green; exterior bracts 9 × 2mm, spreading, green, unbordered; capitulum 40mm, yellow; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·5mm, straw-brown, spinulose; cone 0·6mm. **Fig. 12.**

Wet rocky grassland. Sutherland, Orkney and Shetland. 108, 111, 112. (3). Endemic.

T. subsimile is a characteristic, but little-known species with green leaves and 2–3, long leaf-lobes. The capitulum and achenes clearly indicate that it belongs to the Naevosa group.

48. T. drucei Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 773 (1923)

Leaves 60–170mm, *wide, smooth, glabrous, thin, usually spotted*; leaf-lobes 2–4, broad, slightly dentate or entire; *terminal lobe broad, entire, rounded*; petiole dull purple, winged or unwinged. Scapes 100–200mm, erect, pale; exterior bracts 8 × 2mm, spreading, dull glaucous green, unbordered; capitulum 40mm, yellow; ligules striped grey; styles exserted, *yellow*, pollen present. Achenes 3·5mm, pale brown, spinulose above; cone 0·5mm. **Fig. 13.**

Wet places, especially gorges, cliffs etc., often on limestone. Northern and western parts of Britain, Ireland; local. 1, 49, 73, 90, 92, 99, 101, 108, 111, H2, 20. (9, H2). Endemic.

This is the only Naevosa species (with spotted leaves and spreading exterior bracts) with wide, thin leaves with rounded terminal leaf-lobes. The grey stripes to the ligules and the yellow styles are also distinctive.

49. T. lainzii van Soest, *Trab. Jard. bot. Univ. Santiago*, **7**: 5 (1954)

A small, delicate plant. Leaves 40–100mm, erect, *spathulate, smooth, dark green, often spotted,* lobed or *unlobed*; leaf-lobes 4–5, triangular-patent, slightly dentate; terminal lobe short, often *rounded*; petiole purple, unwinged. Scapes 60–130mm, erect, narrow, pale; exterior bracts 6×2mm, spreading, green, darker outside, unbordered; capitulum 25mm, convex, deep yellow; ligules striped dark grey; styles exserted, discoloured, pollen present. *Achenes 3·0mm,* straw-brown, spinulose; cone 0·4mm. $2n = 24$*. Obligate agamosperm. **Fig. 13.**

Wet grassland, usually on limestone. Western Scotland and western Ireland. 75, 98, 101, 103, 104, H9, 16. (5, H2). Native.
Scotland, Ireland and Spain. Br, Hb, Hs.

T. lainzii is apparently a 'Lusitanian' species with a striking disjunct distribution occurring in Spain and western parts of the British Isles (*cf* 10. *T. hispanicum*). It is of doubtful sectional affinity. The involucral and achene characters suggest the Vulgaria, as also does the triploid chromosome number (only 51. *T. laetifrons* and 64. *T. adamii* share this number in the Spectabilia) whereas the small size of all its parts is more reminiscent of the Erythrosperma. A relationship to the Spectabilia is indicated only by its Atlantic distribution and the shape, colour and particularly the spotted nature of the leaves (very rarely found outside the Spectabilia). It is possible that *T. lainzii* may have arisen through hybridisation between species of the Vulgaria and Spectabilia. The spotted leaves and distribution make it convenient for this species to be placed here at present; it is the only small, delicate species with spotted leaves.

50. T. naevosum Dahlst. in Warming, *Bot. Faeröes*, **3**: 840 (1908)

A squat, robust plant. Leaves 80–200mm, *very rough, bristly, grey-green,* usually spotted; leaf lobes 5–7, *rather crowded,* patent or slightly recurved, short and broad, distal margin sigmoid, almost entire; petiole dull purple, winged. Scapes 50–180mm, thick, pale; *exterior bracts 10–12×3mm,* erect-spreading, green, scarcely bordered; *capitulum 50–60mm,* flat, mid-yellow; ligules striped purple; styles exserted, discoloured, pollen present. Achenes 3·7mm, straw-brown, *with thick spinules above;* cone 0·7mm, rather thick. $2n = 32$. Obligate agamosperm. **Fig. 13.**

Damp hay-meadows; locally common in northern Scotland, rare elsewhere. 62, 64, 65, 70, 90, 94, 101, 105, 108–112. (13). Native.
North-west Europe; also in Greenland where it is probably native. Br, Fa, Is, No, Su.

This is a most characteristic species with large, rough leaves, with broadly-

winged petioles, and larger involucres and capitula than any other species in this section. It is variable, especially in leaf-shape, but this is perhaps only due to environmental modification. Icelandic material, similar to forms from Scotland and Scandinavia which are here included in *T. naevosum*, have been described as separate species by Christiansen (1942). These include the following Icelandic taxa which I am not at present prepared to list as synonyms.

T. akransense p. 268	*T. armatum* p. 285	*T. asperum* p. 310
T. atroglaucum p. 307	*T. azureum* p. 267	*T. brachylobum* p. 332
T. brevilobum p. 309	*T. choodeum* p. 334	*T. cyclocentrum* p. 312
T. latihastatum p. 321	*T. luxurians* p. 335	*T. rhomboideum* p. 321
T. selenophoreum p. 315	*T. subpardinum* p. 306	

51. T. laetifrons Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 88 (1924), *non* Hagl., *Bot. Not.*, **1934**: 20 (1934)

T. serratilobum Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 418 (1927)
T. shetlandicum Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 429 (1927)
T. acidodontum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 620 (1929)

Leaves 80–200mm, fairly smooth, dull, rather pale green, unspotted; leaf-lobes 3–5, *recurved, dentate*; petiole dull purple, or sometimes green, winged. Scapes 100–200mm, green; exterior bracts 9 × 2mm, spreading, green, scarcely bordered; capitulum 40mm, yellow; ligules striped purple; styles exserted, discoloured, pollen present. Achenes 3·5mm, light brown, slightly spinulose; cone 0·6mm. $2n = 24^*$. Obligate agamosperm. **Fig. 13.**

Wood margins and open woodland, less often in open fields; commoner in the north. 3, 17, 20, 22, 23, 29, 31, 34, 42, 44, 45, 60, 62, 65, 67, 68, 90, 94, 97, 99, 103, 110–112, H9, 16. (24, H2). Endemic.

This is a rather characterless species with green, unspotted leaves, recurved, dentate leaf-lobes, narrowly-winged petioles and spreading exterior bracts. As the triploid chromosome count suggests, *T. laetifrons* shows some affinities with the Vulgaria; it is placed here largely on account of the smallish exterior bracts and fairly large achenes.

SPECIES WITH BRIGHT GREEN, UNSPOTTED LEAVES, ORANGE-YELLOW HEADS AND SPREADING EXTERIOR BRACTS (CROCEA) (NOS. 52–57)

52. T. croceum Dahlst., *Bih. K. svenska VetenskAkad. Handl.*, **26**(3): 12 (1900)

Leaves 60–160mm, *smooth, pure green, unspotted*; leaf-lobes 4 or 5, recurved, short, triangular-sagittate, nearly entire, or leaves not lobed, remotely dentate; *petiole green, winged.* Scapes 100–200mm, pale; exterior bracts 7 × 2·5mm, erect, green, with a *white border*, violet-tipped; capitulum 40mm, very deep yellow; ligules striped violet; styles exserted, *yellow, pollen usually present. Achenes*

4·0mm, slender, pale brown, spinulose at apex; *cone 0·7mm, narrow.* $2n = 32$*. Obligate agamosperm. **Fig. 14.**

Rock ledges, usually north-facing, in base-rich, but rather acid localities. 600–1,100m (2,000–3,500ft) except in Glen Clova, Angus, where it descends to 300m (1,000ft). The Scottish Highlands; local. 88, 90, 92, 96, 98. (5). Native. Scotland and Lapland; not at present known from Iceland or the Faeroes, although occurring in Greenland. Br, Fe, No, Su.

The smooth, bright green leaves with green petioles, orange-yellow heads and spreading exterior bracts distinguish this species from all except nos. 53–57. From these it is separated by a combination of sagittate leaf-lobes, bordered exterior bracts and rather large, pale achenes.

53. T. ceratolobum Dahlst., *Ark. Bot.*, **12**(2): 12 (1912)

T. acidotum M.P. Chr., *Bot. Iceland*, **3**(3): 279 (1942)

Leaves 50–150mm, *narrow, smooth, pure green, unspotted; leaf-lobes 5–8*, regular, patent, *short, narrow*, acute, entire; petiole green, narrowly winged. Scapes 80–200mm, pale; exterior bracts 7 × 2mm, erect, green, bordered; capitulum 40mm, very deep yellow; ligules striped violet; *styles exserted, yellow, pollen present. Achenes 4·0mm, light brown*, spinulose above; cone 0·7mm, narrow. **Fig. 14.**

Rock-ledges from 900–1,070m (3,000–3,500ft); Ben Alder (Perth) and Cairngorms. 88, 92, 94, 96. (4). Native.
Scotland, Iceland and north-west Scandinavia; also in Greenland. Br, Is, No, Su.

This species is easily recognised by its bright green leaves with many regular, narrow leaf-lobes.

54. T. cymbifolium H. Lindb. f. ex Dahlst., *K. svenska VetenskAkad. Handl.*, ser. 3, **9**(2): 73 (1930)

T. acromaurum Dahlst. in Ostenf. & Gröntved, *Fl. Iceland Faeroes*, 146 (1934)

Leaves 50–150mm, *smooth, pure green, unspotted*; leaf-lobes 3–4, patent, short, ± *obtuse*, scarcely dentate; *petiole green*, winged. Scapes 50–150mm, ascending, pale; exterior bracts 7 × 2mm, spreading-recurved, green, *unbordered*; capitulum 40mm, deep yellow; ligules striped violet; styles exserted, yellow, *pollen present. Achenes 3·5mm, rust-coloured*, spinulose above; *cone 1·0mm, narrow.* $2n = 32$*. Obligate agamosperm. **Fig. 14.**

Rare, at 1,000m (3,200ft) in the south-west corrie of Ben Lawers, Perth, on calcareous schist. Possibly also on Ben More, Mull. 88,103? (1). Native.
Jan Mayen, northern Iceland, Scotland, northern Lapland and Bear Island; also in south-west Greenland. Br, Fe, Is, No, Sb.

This species shows a most remarkable disjunct distribution in the arctic. The Ben Lawers station is 10° latitude south of any other in Europe, and this species is a notable addition to its famous relict flora.
T. cymbifolium is the only reddish-fruited species with bright green leaves and orange-yellow heads in this country. The recurved and unbordered exterior bracts are also distinctive.

55. T. craspedotum Dahlst., *Bergens Mus. Aarb. for 1923–1924.*, **6**: 9 (1925)

Leaves 40–100mm, *smooth, rather pale, slightly bluish-green, unspotted*; leaf-lobes 3–4, patent, short, ± deltoid, entire (−dentate); terminal lobe short, *obtuse, often rounded; petiole short, green, winged.* Scapes 50–100mm, erect, pale; exterior bracts 7 × 2mm, spreading, green, *conspicuously bordered*; capitulum 35mm, deep yellow; ligules striped violet, styles exserted, *yellow, pollen absent. Achenes 3·2mm, pale brown*; cone 0·3mm. $2n = 32$. **Fig. 14.**

Acid, but base-rich rock-ledges from 900–1,200m (3,000–4,000ft) on Ben Avon, Banff, and Aonach Beag, Inverness. 94, 97. (2). Native.
Faeroes, southern Iceland, Scotland and Norway (Hordaland); local and rare. Br, Fa, Is, No.

This rare and geographically disjunct species is best recognised by its pale green leaves and deep yellow flowers, with bordered exterior bracts and no pollen. The small, pale brown achenes with short cones are very characteristic.

56. T. pycnostictum M.P. Chr., *Bot. Iceland*, **3**(3): 266 (1942)

T. stictophoreum M.P. Chr., *Bot. Iceland*, **3**(3): 262 (1942)

Leaves 50–150mm, *rough, pure green, sometimes spotted*; leaf-lobes 4–5, patent, short, entire, *distal margin usually concave-angled*; terminal leaf-lobe short, triangular, mucronate; *petiole green, winged.* Scapes 100–200mm, erect, pale; exterior bracts 9 × 2mm, erect, *imbricate, stiff and thistle-like, glaucous, scarcely bordered*; capitulum 40mm, deep yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·8mm, straw-brown, spinulose; cone 0·7mm. $2n = 32$*. Obligate agamosperm. **Fig. 15.**

Very wet ledges on calcareous schist, from 600–900m (2,000–3,000ft). Central Highlands and Mull. 88, 90, 92, 98, 103. (5). Native.
Faeroes, Iceland, Scotland. Br, Fa, Is.

Although very plastic (large cliff forms can look superficially similar to 44. *T. praestans*), this is a most characteristic species with a unique involucre. While aberrant in several respects (rough, spotted leaves, involucre), the colour of the leaves and flowers, and the achene-shape suggest that this species belongs here among the Crocea species rather than among the Naevosa.

T. stictophoreum is the correct name according to page priority, but the type specimen (at Copenhagen, C) is less satisfactory, and so *T. pycnostictum* is adopted, as this species seems to be identical to the Scottish material.

57. T. hypochaeris Dahlst., *Ark. Bot.*, **12**(2): 40 (1912)

Leaves 50–200mm, *oblong, obtuse*, smooth, mid-green, unspotted, *not lobed, regularly though sparsely dentate; petiole poorly differentiated, green, winged.* Scapes 100–200mm, erect, pale; exterior bracts 9 × 2mm, spreading, green, bordered; capitulum 45mm, deep yellow; ligules striped grey-violet; styles exserted, *discoloured*, pollen present. Achenes 3·5mm, straw-brown, spinulose above; cone 1·0mm, narrow. **Fig. 15.**

Habitat in this country unknown but occurring on cliffs in Norway. Coire Adair, north of Loch Laggan, Inverness. 97. (1). Native.
Southern Iceland, Scotland and south-west Norway. Br, Is, No.

One small plant collected by E. S. Marshall in 1917 appears to be this species. It obviously requires refinding.
T. hypochaeris has green, unspotted leaves of a most individual shape and deep yellow flowers. Christiansen (1942) has placed it together with some non-British species in a separate section Macrodonta. It does not, however, seem possible to differentiate *T. hypochaeris* from species of his section Crocea.

58. T. stictophyllum Dahlst., *Ark. Bot.*, **12**(2): 38 (1912)

Leaves 80–250mm, stiffly erect, ovate-lanceolate, rough, greyish-green; leaf-lobes 3–4, *recurved, very long, dentate*; petiole purple, winged. Scapes 100–250mm, erect, *narrow*, pale; exterior bracts 9 × 2·5mm, erect, purple-tipped, bordered; *capitulum 50–60mm*, yellow; ligules striped *red-purple;* styles exserted, discoloured, pollen present. *Achenes 3·2 × 1·3mm, short and wide, straw-brown*, spinulose; cone 0·8mm. **Fig. 15.**

Wet, shaded rocks at low altitudes. Very local in England and Scotland. 29, 54, 60, 75, 101, 103, 109, 111, 112. (9). Native, at least in Scotland; possibly introduced in Cambridgeshire and Lincolnshire.
Faeroes, Iceland, Britain and Norway. Br, Fa, Is, No.

This is a distinctive species of uncertain affinity. The large, stiff, grey leaves, of a most individual shape, and the small achenes are most characteristic.

SPECIES WITH ERECT EXTERIOR BRACTS AND SMALL ACHENES (THE *T. NORDSTEDTII* GROUP) (NOS. 59–65)

59. T. caledonicum A. J. Richards, **sp. nov.** (see p. 97)

Leaves 40–100mm, *rather smooth*, ± *glabrous*, dark green, *unspotted* or purplish; leaf-lobes 4–6, *recurved*, short, distal margin convex, ± entire; terminal lobe short, *rather rounded*, but with a *mucronate tip; petiole* ± *purple*, unwinged. Scapes 20–150mm, ascending-erect, pale; exterior bracts 11 × 3mm, *erect, very dark purplish-green, glaucous*, red-tipped, unbordered; capitulum convex or

closed, deep yellow; ligules flat, or *sometimes involute*, short, striped purple; *styles inserted, discoloured, pollen absent. Achenes 4mm, grey-brown, slightly spinulose above; cone 0·2mm.* $2n = 40$*. **Fig. 15.**

Wet, north- or east-facing cliffs on calcareous schist in Glen Clova, Angus, 600–700m (2,000–2,300ft). 90. (1). Endemic.

The characters of the involucre, capitulum and achenes clearly indicate that this species belongs to the *T. nordstedtii* group. At the same time it has many features of 37. *T. spectabile* and its allies (nos. 36–40); this may, however, represent an example of parallel evolution in response to upland conditions. The characteristic leaf-shape, very dark involucre, short and sometimes involute ligules, lack of pollen and grey-brown achenes are all diagnostic.

60. T. pseudonordstedtii A. J. Richards, **sp. nov.** (see p. 97)

Leaves 50–130mm, decumbent, almost glabrous, green or dark green, often suffused purple; leaf-lobes 4–6, *regular, recurved, very short, usually entire; interlobes very narrow, often reduced to the mid-rib*; petiole narrow, winged, with a purple mid-rib. Scapes 80–200mm, erect, purplish; *exterior bracts* 9×3*mm, erect, dark green*, unbordered; *capitulum up to 35mm, convex*, deep yellow; ligules short, striped purple; styles exserted, discoloured, pollen present. *Achenes* $3 \times 0{\cdot}9$*mm, grey-brown*, shortly tuberculate above; *cone 0·3mm.* $2n = 32$*. Obligate agamosperm. **Fig. 16.**

Calcareous flushes from 350–450m (1,200–1,500ft) in Upper Teesdale, Co. Durham. 66. (1). Endemic.

Although this species resembles 61. *T. nordstedtii* in many ways it has a very characteristic leaf-shape.

61. T. nordstedtii Dahlst., *Ark. Bot.*, **10**(11): 27 (1911)

Leaves 40–160mm, *very variable, usually smooth*, mid-green (sometimes purplish), unspotted; leaf-lobes usually 4–5, patent, triangular, *obtuse, distal margin concave*; petiole purple, sometimes green, usually winged. Scapes decumbent to erect, green or purplish; *exterior bracts* 10×3*mm, erect, dark, glaucous, unbordered*; capitulum 40mm, deep yellow; *ligules short, striped purple or red*; styles exserted, discoloured, pollen usually present. *Achenes 3·5mm, olive-brown, spinulose above*; cone 0·4mm. $2n = 48$*. Obligate agamosperm. **Figs. A, 16.**

Wet places throughout Britain below 450m (1,500ft), common; Ireland. Mostly confined to wet meadows in the east, but very catholic in the west, occurring on walls, banks, cliffs, roadsides and even waste ground. 1–5, 8, 10–24, 26, 28, 29, 34–42, 44, 45, 47–49, 52, 55, 57–68, 71, 83, 89, 91, 92, 95–98, 101, 103, 107, 109, 111, H1, 16, 27, 28, S. (66, H4, S). Native.
Western Europe and southern Sweden. Be, Br, Da, Ga, Ge, Hb, Ho, Hs, Lu, Su.

This species and 64. *T. adamii* are the only common Spectabilia species in southern and eastern England and the Midlands.
This species is very plastic for characters which are generally reliable in *Taraxacum*, such as the presence of anthocyanin in the petioles, mid-ribs and scapes; leaf-shape (Fig. A) and the presence of pollen. It is not yet clear whether all the forms represent a single genotype, although this may well be so. Significantly, several different forms of *T. nordstedtii* from Sweden, Britain, the Netherlands, France and Spain have all proved to be hexaploid, the only European species of *Taraxacum* known to be so. *T. nordstedtii* is best recognised by the erect, dark, glaucous, unbordered exterior bracts, the short ligules with reddish stripes, the olive-brown achenes (resembling those of section Vulgaria in shape and colour, although rather longer) and, in non-laciniate forms, the concave-angled distal margin to the leaf-lobes.

62. T. hygrophilum van Soest, *Acta bot. neerl.*, **5**: 100 (1956)

Plant small. Leaves 20–60mm, erect, smooth, pure green, unspotted; leaf-lobes 3–4, *crowded, recurved, short and broad, entire; terminal lobe short*, rounded; petiole short, *whitish*, broadly winged. Scapes 50–80mm, erect, narrow; *exterior bracts 5 × 2mm, erect, green, with a clear white or rose border*; capitulum 30mm, deep yellow; ligules short, striped grey-violet; styles exserted, dark, pollen present. Achenes 3·0mm, brown, spinulose above; cone 0·3mm; rostrum 5·0mm (usually 7–10mm in other species). **Fig. 17.**

Water meadows. Stodmarsh, Kent. 15. (1). Native.
England and the Netherlands, rare. Br, Ho.

Quite unlike any other species, *T. hygrophilum* is best known by the small, bright green leaves of a characteristic shape, and the small brown achenes with a very short rostrum.

63. T. litorale Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 256 (1906)

Small to medium-sized plant. Leaves 50–100mm, *erect, narrow*, smooth, *dark green*, sometimes *purplish*, unspotted; leaf-lobes 2–4, *distant, recurved, shortly triangular*, entire; interlobes filiform-dentate; petiole long, narrow, *dark purple*, slightly winged. Scapes 50–100mm, decumbent to erect, purplish; *exterior bracts 8 × 2mm, erect, dark green*, scarcely bordered; *capitulum 35mm*, small, deep yellow; ligules not particularly short, striped violet; styles exserted, *yellow, pollen absent. Achenes 3·3mm, dark straw-coloured*; cone 0·5mm. **Fig. 17.**

Meads (seasonally flooded hay-meadows) near Oxford. 22, 23. (2). Native.
England and Fennoscandia. Br, Da, Fe, No, Su.

Although this species is frequently placed in the section Vulgaria, it seems to me to belong in the *T. nordstedtii* group. These species all have rather small, dark achenes, resembling those of the section Vulgaria in shape, and erect, dark exterior bracts. They are also plants of wet places. It seems to me relatively

unimportant as to whether they are treated as Vulgaria or Spectabilia species, as long as they are treated consistently. I have chosen the latter section, although their area of distribution is more southern and eastern than is usual. There is no doubt that the group is anomalous, but it seems no more deserving of special sectional status than the Naevosa or Crocea groups. *T. litorale* is best recognised by its narrow, dark leaves, dark exterior bracts and the absence of pollen. 59. *T. caledonicum* has larger achenes of a different colour.

64. T. adamii Claire, *Bull. Soc. bot. Rochelaise for 1890*, **12**: 49 (1891)

T. gelertii Raunk., *Bot. Tidsskr.*, **25**: 139 (1903)
T. britannicum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1926*, **8**: 30 (1927)
T. hibernicola H. Lindb. f., *ined., nom. in herb.*
T. kewense Hagl., *ined., nom. in herb.*
T. subbritannicum Hagl., *ined., nom. in herb.*

Leaves 50–200mm, *smooth*, dull green, *often somewhat bluish, unspotted*; leaf-lobes 3–5, patent or somewhat recurved, *triangular, distal margin straight-sided or convex*, almost entire; petiole purple, usually winged. Scapes 70–200mm, erect; *exterior bracts 7×2mm, erect, very dark green, with an indistinct white border*; capitulum 40mm, deep yellow; *ligules rather long*, striped grey-violet; styles exserted, discoloured, pollen present or absent. *Achenes 3·2mm, brownish*, spinulose above; cone 0·5mm. $2n = 24$*. Obligate agamosperm. **Fig. 16.**

Wet meadows; also not infrequently in man-made habitats such as walls, pavements, gardens, gravel-pits etc.; on cliffs and ravines in the north and west. Throughout Britain, becoming scarcer in the north; Ireland. 1, 2, 6, 8, 9, 12–17, 20, 22–24, 29, 32, 39, 41, 42, 45, 49, 57–60, 62, 64, 71, 95, 99, 101–103, 111, 112, H1, 9, 16, 28, S. (36, H4, S). Native.
Western Europe and Fennoscandia. Be, Br, Da, Fe, Ga, Ge, Hb, Ho, Hs, Lu, No, Su.

T. adamii is very variable, especially in leaf-shape. Forms with recurved leaf-lobes have been named *T. britannicum*, and some contemporary authorities still recognise this species. However, *T. britannicum* is identical to *T. adamii* with regard to involucre, capitulum and achenes and in all leaf-characters except shape. The two leaf-forms can be found growing intermixed, together with all intermediates, and it is possible to change *T. britannicum* forms into *T. adamii* in cultivation. *T. adamii*, often a very attractive species, is characterised by smooth, often bluish-green leaves with a clear purple mid-rib, small brownish achenes, and characteristic erect, ovate-lanceolate, very dark and indistinctly bordered exterior bracts. It is usually placed in the section Vulgaria (see under 63. *T. litorale*).

64a. T. hibernicum Hagl., *Bot. Not.*, **1935**: 433 (1935)

Leaves 50–140mm, *smooth*, dull, *pale green*, unspotted; *leaf-lobes 4–5, recurved, short, distal margin convex*, lower lobes slightly dentate; petiole narrow, purple,

± unwinged. Scapes 50–150mm, ascending, pale or purplish; *exterior bracts 7 × 2mm*, spreading-erect, rather dark green, *bordered*; capitulum 40mm, deep yellow; ligules fairly long, striped grey-violet; styles exserted, discoloured, pollen present. *Achenes 3·2mm, brownish, spinulose*; cone 0·5mm. **Fig. 17.**

Wet places in western Ireland. H1, 9, 16. (H3). Endemic.

T. hibernicum is of uncertain status. It is very close to some forms that can be referred to 64. *T. adamii*, but differs from them in having paler leaves, which are narrower and possess more highly recurved leaf-lobes and rather paler involucres with slightly less erect exterior bracts. I am not yet sure whether this species merely represents the extreme western modification of *T. adamii*, or whether it is genetically distinct and deserving specific status.

65. T. cambriense A. J. Richards, **sp. nov.** (see p. 98)

Plant medium-sized, *delicate, almost glabrous, pale green.* Leaves 80–170mm, *erect, smooth*, unspotted; leaf-lobes 4–5, ± patent, *narrow*, acute, entire or slightly denticulate; petiole narrow, purple, unwinged, *mid-rib green.* Scapes 100–200mm, erect, green; *exterior bracts 7 × 2·5mm, adpressed-erect, dark green, glaucous, with a clear white border*; capitulum 40mm, yellow; ligules short, striped grey-violet; styles exserted, discoloured, pollen absent. *Achenes 3·8 × 1mm*, straw-coloured, slightly tuberculate above; cone 0·4mm. **Fig. 16.**

Rocks and cliffs, usually on limestone. South Wales. 41, 42, 44, 45. (4). Endemic.

This is a characteristic species, best recognised by the conspicuous borders to the exterior bracts and the absence of pollen.

Section Vulgaria*

Section **VULGARIA** Dahlst., *Acta Flor. Suec.*, **1**: 37 (1921)

Vulgaria Dahlst. in Lindman, *Svensk Fanerogamfl.*, 560 (1918)
Section *Subvulgaria* M.P. Chr., *Bot. Iceland*, 3(3): 331 (1942)
Section *Septentrionalia* Dahlst., *nom. in mscr.*

Plants usually robust. Leaves very variable, usually lobed, not linear, very rarely spotted, more frequently blotched dark on interlobes. Scapes arachnoid; exterior bracts 8–20 × 1–6mm, erect to recurved, never corniculate, although sometimes with a small callus, rarely obviously bordered; capitulum 30–70mm, yellow; ligules most commonly striped grey-violet; styles rarely yellow, pollen usually present. Achenes 2·5–3·5mm, rather broad, straw-coloured or brownish, most commonly olive-brown, spinulose, at least above; cone rarely exceeding 0·7mm, short, conical; rostrum 7–14mm. $2n$ = 16, 17, 18, 22, 23, 24, 25, 26, 27, 28, 33 (but nearly always 24). Sexuals, facultative agamosperms, or obligate agamosperms, nearly always the latter. Flowering April–May (occasionally March–June).

Very common plants of grassland, waste places, paths, roadsides, walls etc., usually in some way associated with man. Relatively rare in parts of northern and western Scotland and western Ireland. Throughout Europe (all except Sb).

The following comments on collection and identification have already been made in the Introduction but they are especially relevant here.
Two sets of leaves are produced each year. Only the small over-wintering leaves, which develop as the spring leaves at the time of flowering, are taxonomically reliable. The second set, which develop during the summer and are usually killed by autumn frosts, are called *status aestivalis* leaves and are taxonomically unreliable. Because of this, it is unwise to attempt the identification of species in this section after May. Plants growing in excessively shaded, trodden or exposed localities are also very difficult to identify. Only experience will allow one to judge which genotype will assume which phenotype in particular environments, and one must be prepared not to be able to name a proportion of the material. In cultivation the species are perfectly recognisable, and this will also be found to be true in most wild situations. The key, allied with the

* According to the *International Code of Botanical Nomenclature*, the section which contains the type species for the genus should bear the same name as the genus. The type species for *Taraxacum* is *T. officinale* Weber, a name which has often been used in an aggregate sense, particularly for the section Vulgaria (e.g. Clapham, Tutin & Warburg 1962). However, as far as I know the microspecies identity of Weber's type specimen is not known, and until this has been determined the section which should bear the name Taraxacum is uncertain. For the time being, therefore, the sectional name Vulgaria is maintained. If it should happen that Weber's type can be traced and identified, it will follow that the section to which this belongs will have to be renamed *Taraxacum*. As it is common to use the names of the sections on their own without prefacing them by 'the section', this will lead to difficulties since Taraxacum (referring to the section) will not readily be distinguished from *Taraxacum* (the genus).

illustrations and species descriptions, should be adequate in most cases, but experience and access to a good herbarium are particularly important in this section, which is rather more critical than the others.

SPECIES WITH GREENISH PETIOLES (NOS. 66–92)

66. T. obtusilobum Dahlst. ex Hagl., *Bot. Not.*, **1935**: 117 (1935)

Leaves 50–200mm, *spathulate, grey-green*, usually lobed; leaf-lobes (0)3–8, short, *obtuse*, entire or filiform-dentate; *petiole white* to reddish, usually winged. Scapes 100–300mm, slender, pale; exterior bracts 8 × 2mm, spreading-erect, *very dark, suffused purple; capitulum 35mm, pale yellow*; ligules striped *red or grey*; styles exserted, discoloured, *pollen present*. Achenes 3·0mm, olive-brown. $2n = 16^*, 17^*$. Sexual. **Fig. 24.**

Known only from a road-verge near Sherburn Village, Co. Durham, in 1965 and 1967; apparently no longer there. 66. (1). Introduced.
England, south-west Sweden and Denmark (Jylland). (Br), Da, Su.

This species is quite unlike any other in this section, with its entire or very blunt-lobed, grey-green leaves. It is always sexual and diploid, but it characteristically hybridises extensively wherever it occurs and some of the hybrids are triploid and agamospermous. These hybrids occurring in the presence of *T. obtusilobum* can be very taxonomically confusing. It is the only wholly sexual north European species in the genus. This, together with the remarkable leaf-shape suggest that is is a primitive species and may possibly be an interglacial relict. Taxa such as this may have hybridised with 'ancestral agamosperms', now placed in the section Ceratophora Dahlst., giving rise to present-day Vulgaria species.

67. T. subcyanolepis M.P. Chr. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 312 (1934)

Leaves 50–250mm, *mid-green*; leaf-lobes 3–5, recurved, straight-sided or distal margin ± convex, filiform-dentate; *petiole green, narrowly winged*. Scapes 50–250mm; exterior bracts 10 × 2mm, *recurved, suffused reddish-purple*; capitulum 45mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. $2n = 16^*, 17^*, 18^*, 20^*, 23^*, 24^*, 25^*, 26^*, 27^*$. Sexual or facultative agamosperm. **Fig. 19.**

Closed, herb-rich grassland on limestone, and on sand-dunes. Locally common throughout the British Isles. 9, 22, 23, 25, 26, 29, 41, 48, 58, 59, 66, 67, 89, 90, 101, 107, H9, 12, 16, S. (16, H3, S). Native.
North-west Europe and southern Sweden. Be, Br, Da, Ga, Hb, Ho, Su.

This species hybridises with pollen-bearing agamospermous species, although

apparently less freely than the preceding. Hybrids occur with 1. *T. brachyglossum*, 17. *T. oxoniense*, 70. *T. ancistrolobum* and 114. *T. hamatum*, but no doubt a number of others occur. They can be expected whenever *T. subcyanolepis* is found in the company of polliniferous agamosperms. The parentage of a hybrid is often difficult to establish and depends largely on knowledge of the other species present. It is the only Vulgaria species with green petioles and recurved, reddish-purple exterior bracts, and, with the exception of the preceding, it is the only one which has regular pollen, the grains being of uniform size which is always an indication of sexuality.

68. T. cyanolepis Dahlst., *Ark. Bot.*, **10**(11): 40 (1911)

T. alienum Dahlst., Rep. botl Soc. Exch. Club Br. Isl. for 1926, **8**: 30 (1927)

Leaves 100–300mm, *dark green*; leaf-lobes 3–4, *recurved, rather broad*, distal margin convex, entire or filiform-dentate; *petiole green, winged.* Scapes 150–350mm, erect; *exterior bracts 12 × 3mm, spreading, violet-purple*; capitulum 55mm, deep yellow; ligules striped red-purple; styles exserted, discoloured, pollen present. Achenes 3mm, olive-brown. $2n = 24$. Obligate agamosperm. **Fig. 19.**

Roadsides etc., especially in rather lush, tall grass; locally frequent. 12, 16, 17, 22–24, 29, 32, 34, 35, 41, 45, 49, 64, 67, 106, 111, S. (17, S). Native.
Northern Europe. Be, Br, Da, Fe, Ho, No, Su.

T. cyanolepis is the only Vulgaria species with both green petioles and spreading, violet-purple bracts.

69. T. sellandii Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 19 (1925)

T. granvinense Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 25 (1925)

Leaves 100–250mm, pale green; *leaf-lobes 4–5, slightly recurved*, distal margin somewhat convex, upper lobes entire, lower dentate; *petiole green*, unwinged, or almost so. Scapes erect, 100–300mm; *exterior bracts 10 × 2mm, recurved, narrow, green* or somewhat violet, purple-tipped; capitulum 50mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, pale brown. $2n = 24^*, 26^*, 28^*$. Obligate agamosperm. **Fig. 21.**

Road-verges and grassland; local, but commoner in the north. 9, 17, 20, 28, 29, 36, 41, 60, 62, 66, 67, 70, 95, 96, 99, 101, S. (16, S). Native.
Britain, Norway and Sweden. Br, No, Su.

A rather characterless, but not unattractive species with green petioles, *T. sellandii* is best recognised by the recurved, somewhat broad leaf-lobes and the recurved, narrow and usually coloured exterior bracts.

70. T. ancistrolobum Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 27 (1925)

Leaves 100–250mm, dull, dark green; *leaf-lobes 2–4, recurved, large and broad*, distal margin convex, that of the upper lobes usually filiform-dentate; *petiole green, winged.* Scapes 150–300mm, rather narrow; exterior bracts 9 × 2·5mm, spreading-recurved, green or slightly suffused violet; capitulum 55mm; ligules striped red-purple; styles exserted, discoloured, pollen present. Achenes 3·0 × 1·4mm (very wide), straw-brown. **Fig. 20.**

Roadsides, grassland, wood-margins; scattered, but not uncommon. 9, 12, 17, 22, 23, 29, 36, 41, 46, 59, 60, 62, 66, 67, 69, S. (15, S). Native.
Northern, north-west and central Europe. Be, Br, Da, Fe, Ga, Ge, He, Ho, No, Su.

T. ancistrolobum is characterised by having green petioles and few, large, rounded leaf-lobes. It is difficult to confuse with any other species except some forms of 78. *T. alatum*, which, however, has glaucous, pink-tipped exterior bracts, and 68. *T. cyanolepis* which has violet-purple bracts.

71. T. sublaciniosum Dahlst. & H. Lindb. f. in Dahlst., *Ark. Bot.*, **19**(18): 15 (1925)

T. sublutescens Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1926*, **8**: 32 (1927)
T. subexpallidum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 628 (1929)
T. surreyense Hagl., *ined., nom. in herb.*

Leaves 100–300mm, dark green; leaf-lobes 5–8, *slightly recurved*, narrow, *rather long*, at least the lower lobes dentate; *terminal lobe usually rather broad and obtuse*; interlobes with teeth and lobules; *petiole green, unwinged*, or almost so. Scapes 150–300mm, erect; exterior bracts 15 × 4mm, spreading dark green; capitulum 55mm, deep yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·2mm, olive-brown. **Fig. 21.**

Waste-places, gardens, paths etc., rarely in closed communities; locally common. 9, 10, 12, 17, 20, 22–24, 29, 32–34, 39, 41, 42, 58, 60, 64, 66, 79, 101, 105, S. (22, S). Probably native.
Britain and Fennoscandia but perhaps absent from Denmark. Br, Da?, Fe, No, Su.

This is a tall, dark green species with slightly recurved, narrow leaf-lobes, green petioles and large, spreading exterior bracts.

72. T. stenacrum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 627 (1929)

Leaves 150–300mm, erect, mid- to dark-green; *leaf-lobes 6–8, patent, long, very narrow, long-dentate at base*; terminal lobe narrow, ± subdivided; petiole

narrow, *green*, ± unwinged. Scapes 150–300mm, erect; *exterior bracts 15 × 2·5mm, recurved, green*; capitulum 50mm, yellow; ligules striped olive-brown; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 23.**

Waste-places, gardens, paths etc., rarely in closed communities; confined to south-central England but locally common. 9, 17, 23, 24, 29, 32. (6). Endemic.

T. stenacrum is the only green-petioled Vulgaria species with long, narrow, strictly patent leaf-lobes.

73. T. inane A. J. Richards, **sp. nov.** (see p. 98)

Leaves 150—250mm, erect, dark green; leaf-lobes 4–6, recurved, broad at base, tapering to a *narrow acuminate apex with up to 7 long-filiform teeth on the distal margin; terminal lobe long, up to* ⅓ *length of leaf, hastate-sagittate, entire; petiole rather long, green* or rose, unwinged. Scapes 150–250mm, erect; exterior bracts 10 × 3mm, recurved, pale green, often lightly suffused purple above, dark green below; capitulum 45mm, yellow; ligules striped grey-purple; styles exserted or ± inserted, *discoloured, pollen absent.* Achene characters not known. **Fig. 24.**

Rocks by the sea. Inverneill, Kintyre. 101. (1). Endemic.

This new species is only known from a single specimen collected by A. G. Kenneth in 1970. Although in principle new species should not be described from such scanty material, this plant is in fact very distinctive, lacking pollen, and with a most individual leaf-shape.

74. T. procerum Hagl., *Acta Horti gothoburg.*, **11**: 34 (1936)

Leaves 150–300mm, erect, dark green; leaf-lobes 4–5, *slightly recurved, long,* entire or filiform-dentate; *terminal lobe rather long (up to* ¼ *length of leaf), helmet-shaped, apiculate, usually subdivided; petiole green, usually unwinged.* Scapes 200–350mm, erect; *exterior bracts 15 × 4mm, recurved, green,* or somewhat coloured; *capitulum 60–70mm; ligules striped red-purple*; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 24.**

Roadside near Menmarsh, Oxfordshire; recently discovered in Lancashire. 23, 60. (2). Probably introduced, although perhaps previously confused with 71. *T. sublaciniosum* and 72. *T. stenacrum.*
Northern and central Europe. Au, (Br), Fe, Ga, Ge, He, Ho, Su.

T. procerum is best distinguished from 71. *T. sublaciniosum*, which it closely resembles, by the somewhat elongate, helmet-shaped terminal leaf-lobes. 72. *T. stenacrum* has smaller, narrower exterior bracts; 76. *T. linguatum* has an obtuse terminal leaf-lobe and shorter lateral lobes; while 75. *T. pannucium* has a much longer petiole.

75. T. pannucium Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 21 (1925)

T. protractifrons Dahlst. ex M.P. Chr. & Wiinst. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 308 (1934)

Leaves 150–300mm, erect, *pale green*; leaf-lobes 3–4, patent, abruptly narrowed from a wide base, dentate; *terminal lobe narrow, extenuate, sometimes subdivided; petiole usually long, ¼–½ length of leaf, green, ± unwinged.* Scapes 150–300mm, erect; exterior bracts 12 × 3mm, *erect-spreading, green*, sometimes violet-tipped; capitulum 45mm; ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, straw-brown; cone 0·8mm, narrow. **Fig. 30.**

Usually in herb-rich meadows; local. 22, 23, 26, 28, 29, 55, 66, 82, 95, 112, H16, S. (10, H1, S). Native.
Northern Europe. Be, Br, Da, Fe, Hb, Ho, No, Su.

This species is best recognised by its long green petiole and rather large, erect exterior bracts.

76. T. linguatum Dahlst. ex M.P. Chr. & Wiinst. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 313 (1934)

Leaves 100–250mm, erect, pale green; leaf-lobes 3–4, slightly recurved, *lingulate, ± obtuse*, entire or dentate; *terminal lobe obtuse; petiole green, unwinged.* Scapes 150–250mm, erect; *exterior bracts 10 × 3–4mm, spreading-erect, dark green*; capitulum 50mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 34.**

Waste places; local and uncommon. 16, 23, 29, 31, 57. (5). Introduced.
Northern Europe and Switzerland. Be, (Br), Da, Fe, Ga, He, Ho, Su.

Of the green-petioled species, *T. linguatum* is best known by its pale leaves with more or less entire, lingulate lobes, obtuse terminal lobes and rather short and broad exterior bracts.
There has been some taxonomic confusion in the past between *T. linguatum* and *T. pannulatiforme*, which was also described by Dahlstedt (*Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 563 (1932)). The type of the former comes from Sweden but most of the material in the Stockholm herbarium placed here by Dahlstedt belongs to *T. pannulatiforme*. Conversely, although the type of *T. pannulatiforme* in the Oxford herbarium comes from Britain, I have seen no other British specimens which can be referred to this species. Furthermore, the type material is, in my opinion, inadequate. Nevertheless, Scandinavian material in Stockholm referred by Dahlstedt to *T. pannulatiforme* is undoubtedly distinct from *T. linguatum* and for this we must accept *T. pannulatiforme* as the correct name, at least for the present. Paradoxically therefore, *T. pannulatiforme*, with a British type, cannot at present be accepted as British, whereas *T. linguatum*, with a Swedish type, although undoubtedly occurring in Britain, Belgium and the Netherlands (van Soest 1961, p.329; 1970, p.31) appears to be very rare in Scandinavia.

77. T. pallescens Dahlst., *Ark. Bot.*, **9**(10): 22 (1910)

Leaves 50–150mm, ascending, *glabrous, pale yellowish-green; leaf-lobes 5–8, recurved,* dentate; *petiole short, green, broadly winged.* Scapes 80–180mm, erect; exterior bracts 10 × 3mm, recurved, green, or somewhat suffused violet; capitulum 45–50mm, deep yellow; ligules striped violet-brown; styles exserted, discoloured, pollen present. Achenes 2·7mm, olive-grey. **Fig. 25.**

In southern England and Wales where it is largely confined to species-rich pasture; it has recently been discovered in Dunbartonshire. 20, 22, 23, 25, 29, 32, 35, 41, 45, 99, S. (10, S). Native.
Northern and central Europe. Be, Br, Da, Fe, Ge, He, Ho, No, Su.

Observations and experiments at Rothamstead Experimental Station show that this species requires a pH of over 6·5 and a high level of potassium.
The yellowish-green leaves with recurved lobes and green petioles make this a most distinctive species.

78. T. alatum H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 20 (1907)

T. semiprivum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 626 (1929)

Leaves 80–250mm, erect, mid-green; leaf-lobes 3–4 (–6), patent or slightly recurved, moderately narrow to broad, distal margin ± convex and with 1 or 2 teeth; *petiole long, ¼–½ length of leaf, green, winged,* sometimes narrowly so. Scapes 100–300mm, erect; *exterior bracts 12 × 3mm, spreading-recurved, glaucous above, pink-tipped*; capitulum 50–60mm, yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, olive-brown. $2n = 24^*$. Obligate agamosperm. **Fig. 20.**

Roadsides, meadows and waste places; locally very common and certainly commoner than the records suggest. 6, 7, 9, 12, 15, 17, 20, 22–24, 29, 32, 33, 41, 44, 53, 60, 62, 66, 67, 83, 99, H16, S. (22, H1, S). Native.
Northern and central Europe. Be, Br, Da, Fe, Ga, Ge, Hb, He, Ho, No, Su.

The combination of long, green, winged petioles with spreading, glaucous, pink-tipped bracts is unmistakable. The leaf-shape is very variable.

79. T. lingulatum Markl., *Acta Soc. Fauna Flora fenn.*, **55**(5): 20 (1926), *non* Dahlst., *ined., nom. in herb.*

T. aequatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 622 (1929)
T. subpallescens Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 29 (1930)

Leaves 50–200mm, spreading, dull green; leaf-lobes 3–6, patent-recurved, acute, ± abruptly narrowed from a broad base; terminal lobe shortly *attenuate*; interlobes dentate and lobulate; *petiole rather long, green or rose,* winged, sometimes narrowly so. Scapes 80–200mm, erect; *exterior bracts 14 × 4mm,*

strongly recurved, glaucous above, dark green below; capitulum 55mm, deep yellow; ligules striped violet-brown; styles exserted, discoloured, pollen present. Achenes 2·7mm, straw-brown. **Fig. 32.**

Roadsides and grassy places. 12, 17, 20, 22, 23, 27, 29–31, 37, 62, 63, 66, 67, 82, 83, 99, 101. (18). Native.
Northern and central Europe. Be, Br, Da, Fe, Ga, Ge, He, Ho, No, Su.

T. lingulatum is a difficult plant to identify. It is perhaps best known by the long, recurved glaucous bracts. The leaf-shape, though characteristic, is not readily described. It can be distinguished from 80. *T. aequisectum* by having fewer leaf-lobes, a longer petiole, and less dentate leaves; and from 81. *T. croceiflorum* by its longer leaf-lobes and violet-brown striped ligules. Despite the similarity in name with 76. *T. linguatum*, there is little morphological resemblance between the two species.

80. T. aequisectum M.P. Chr. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 311 (1934)

Leaves 80–220mm, spreading, lobed to base, dull, rather dark green; leaf-lobes 5–8, patent or slightly recurved, *rather narrow, with 2–4 large teeth; terminal lobe rather narrow, subdivided, ± attenuate; petiole very short* and winged, or *absent*. Scapes 150–250mm, erect; *exterior bracts* 14 × 3*mm, recurved, glaucous above*, dark green below; capitulum 50mm, yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, straw-brown. **Fig. 24.**

Oxford and Lancashire. 23, 60. (2) Probably introduced.
England, southern Scandinavia, Belgium and the Netherlands. Be, (Br), Da, Ho, Su.

Although closely related to the last species, *T. aequisectum* has leaves which are lobed to the base, the leaf-lobes bearing large teeth. It may have been overlooked in the past, but it is clearly rare in the British Isles and may well be introduced from the Continent.

81. T. croceiflorum Dahlst., *Ark. Bot.*, **9**(10): 9 (1910)

Leaves 100–200mm, ascending, rather deep green; leaf-lobes 4–5, pointing forward, patent or somewhat recurved, rather short, dentate; *terminal lobe short, triangular* or tripartite; *petiole not exceeding ¼ length of leaf, green, winged.* Scapes 80–180mm; *exterior bracts 12 × 3mm, spreading-recurved,* green ± suffused with violet, at least at tips; capitulum 45mm, *orange-yellow*; ligules striped red-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, pale buff. **Fig. 19.**

Roadsides and grassy places; local. 9, 16, 17, 23, 36, 41, 59, 60, 67, 101, S. (10, S.). Native.
Northern Europe, introduced in Switzerland. Be, Br, Da, Fe, Ga, Ge, (He), Ho, No, Rs (B, N), Su.

The orange-yellow heads are diagnostic, otherwise it closely resembles nos. 78–80.

82. T. lacerabile Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 27 (1930)

T. lacerilobum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 562 (1932)

Leaves 150–300mm, erect, rather pale green; leaf-lobes 4–7, *pointing forward* or patent, narrow, *strongly dentate*, with *patent, linear processes*; interlobes with large teeth and lobules; *petiole green, unwinged or narrowly winged.* Scapes 200–350mm, erect; *exterior bracts 15 × 5mm, erect, dark green*, paler inside; capitulum 60mm, yellow; ligules striped grey-brown; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 22.**

Walls, gardens etc., local. South Midlands and southern England; possibly introduced in Scotland. 17, 20, 21, 23, 24, 29, 86. (7). Probably endemic.

T. lacerabile has been reported by van Soest (1961) from Belgium, but his description does not fit this species.
T. lacerabile is unmistakable, with long, pale, laciniate leaves, patent, strongly dentate, linear leaf-lobes, and very wide and long, erect exterior bracts.

83. T. expallidiforme Dahlst., *Ark. Bot.*, 9(10): 18 (1910)

T. oncolobum Dahlst., *Bergens Mus. Aarb. for 1923–1924*, **6**: 26 (1925)

Leaves 70–200mm, ascending, *pale green*; leaf-lobes 4–5, *rather crowded*, usually patent ± narrowly deltoid, *not reaching to mid-rib*, entire or filiform-dentate; terminal lobe short, triangular, subdivided; petiole rather *short, pale green or white, broadly winged, mid-rib white.* Scapes 100–250mm, erect; *exterior bracts 9 × 2mm*, recurved, pale, often ± suffused with violet above, darker below; capitulum 45mm, deep yellow; ligules striped purple-brown; styles exserted, discoloured, pollen present. Achenes 2·8mm, olive-straw coloured. **Fig. 20.**

Roadsides and waste places; sometimes in gardens. Widely distributed north to central Scotland; locally frequent in southern England. 6, 9, 15–17, 20, 22–24, 29, 31, 34, 41, 60, 62, 67, 82, 83, H21, S. (18, H1, S). Native, or possibly introduced.
British Isles and Fennoscandia. Br, Da, Fe, Hb, No, Su.

T. expallidiforme is known by the narrow, patent, deltoid leaf-lobes, the broad, pale central undissected portion of the leaf, the broad, pale petiole, and the small, recurved exterior bracts. Of the local, mainly southern species, it is unusual in being otherwise confined to Scandinavia, and it may well be introduced.

84. T. insigne Ekman ex Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 312 (1934)

Leaves 70–200mm, ascending, *pale green*; leaf-lobes 4–7, patent or ± *pointing forward, short, narrow, obtuse, entire*, or with 1–2 large teeth; terminal lobe short, ± tripartite; interlobes lobulate; petiole about ¼ length of leaf, *green, winged.* Scapes 100–250mm, erect; *exterior bracts 9×3mm, erect, dull green*, often violet-tipped; capitulum 45mm, yellow; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 19.**

Usually in dry open grassland, especially sand-dunes; less frequently roadsides and waste places. Scattered throughout Britain and locally frequent. 12, 17–20, 22, 23, 37, 45, 51, 52, 66–68, 75, 99, 101, 106. (18). Native.
Northern Europe. Be, Br, Da, Ga, Ge, Ho, No, Rs(B), Su.

T. insigne resembles the last in having pale leaves with a broad, pale central undivided region and wide, pale petiole. It differs in having narrower leaves, shorter, obtuse leaf-lobes and erect exterior bracts.

85. T. subundulatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 779 (1923)

T. amphiodon Dahlst. ex Hagl., *Bot. Not.*, **1934**: 3 (1934)
T. bercheriense Dahlst., *ined., nom. in herb.*

Leaves 100–250mm, erect, mid-green; leaf-lobes 5–9, patent or *pointing forward*, narrow, rather short, dentate, often on both margins; *terminal lobe short, wide, subdivided; interlobes often with dark blotches, dentate and lobulate; petiole short, green, or rose at base, unwinged.* Scapes 100–300mm, erect; *exterior bracts 12×3mm, spreading-erect, dark green*; capitulum 45mm, deep yellow; ligules striped grey-violet; styles exserted, discoloured, pollen always (?) present. Achenes 3·4mm, straw-brown. **Fig. 22.**

Water meadows, especially when mown for hay (meads); more rarely on lush road-verges etc. Very local but often abundant. Known only from a single station in Kent and from water meadows in the Oxford area. 16, 22, 23. (3). Native.
England and Fennoscandia. Br, Da, Fe, No, Su.

This species has a characteristic leaf-shape, short, greenish, unwinged petioles and large, erect exterior bracts. It is separated with difficulty from the next (86. *T. sublaeticolor*), which has a similar distribution and habitat requirement, by a more robust habit, leaves with shorter petioles and more lobes, and larger involucres and exterior bracts. It appears always to possess pollen in this country, but in Scandinavia it is sometimes lacking.

86. T. sublaeticolor Dahlst., *Ark. Bot.*, **19**(18): 17 (1925)

Leaves 50–200mm, erect, mid-green; leaf-lobes 3–5, patent or *pointing forward*, narrow, rather short, entire or dentate; *terminal lobe short, wide, often subdivided; interlobes often with dark blotches*, dentate and lobulate; *petiole rather*

long, ¼–⅓ length of leaf, narrow, green or rose at base. Scapes 150–250mm, erect; *exterior bracts 8 × 2mm, erect-spreading, dark green, sometimes suffused with violet*; capitulum 40mm, deep yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 22.**

Water-meadows, especially when mown for hay (meads); rarely in other habitats. Probably restricted in the British Isles to the Thames basin. 17, 20–23. (5). Native.
England and Fennoscandia. Br, Da, Fe, No, Su.

The differences between this and the previous species are given under the latter. 87. *T. tenebricans* has a characteristic 'urn-shaped' involucre, slightly winged petioles, smaller fruits and lacks dark blotches on the interlobes; in addition there are differences in leaf-shape.

87. T. tenebricans (Dahlst.) Dahlst., *Ark. Bot.*, **9**(10): 5 (1910)

T. officinale subsp. *tenebricans* Dahlst., *Bot. Not.*, **1905**: 157 (1905)

Leaves 50–200mm, erect, mid-green; leaf-lobes 3–5, patent or slightly recurved, triangular, or sometimes narrow (but scarcely with linear processes), proximal margin dentate, occasionally entire; interlobes frequently with 1 or 2 large teeth; *petiole about ¼ length of leaf, green, narrowly winged*, occasionally unwinged. Scapes 100–250mm, erect; *exterior bracts 7 × 2mm, stiffly erect, spreading at tips giving the involucre a characteristic 'urn-shaped' appearance, dark green, sometimes suffused with purple; capitulum 30–40mm*, yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, olive-brown. **Fig. 21.**

Roadsides, grassy places etc.; local. 15, 16, 21–24, 28, 29, 32, 39, 60, 79, 82, 83, S. (14, S). Probably native only in southern England.
Britain, Belgium, the Netherlands and Fennoscandia. Be, Br, Da, Fe, Ho, No, Su.

T. tenebricans is best known by its distinctive involucre. The green-petioled leaves are very variable, particularly in size.

88. T. tanylepis Dahlst., *Rep. botl Exch. Club Br. Isl. for 1922*, **6**: 776 (1923)

Leaves 70–150mm, erect, dull green; leaf-lobes 4–6, patent or slightly recurved, narrow, entire, or filiform-dentate; terminal lobe sometimes sagittate; *petiole ¼–½ length of leaf, narrow, green or somewhat coloured, unwinged.* Scapes 50–170mm, ascending-erect; *exterior bracts 9 × 3mm, erect-spreading, dark green, bordered*; capitulum 40mm; ligules striped grey-purple; styles exserted, *yellow, pollen absent. Achenes 3·5mm*, straw-brown; *cone ± absent.* **Fig. 27.**

Wet marshy ground. Shore of Loch Leven, Kinross; Bay of Skaill, Sandwick, Mainland and Sweyn Holm, Orkney. 85, 111. (2). Endemic.

T. tanylepis is a remarkable species from several points of view. Although similar to 87. *T. tenebricans* in general morphology, it lacks the characteristic involucre of that species. Further, a number of important characters (bordered exterior bracts, yellow styles, absence of pollen and achene-size and shape) are those of the Spectabilia, to which it may well belong. In that section it is closely related to 35. *T. landmarkii*, which, however, has usually entire leaf-lobes of a different shape, discoloured styles and smaller, browner achenes with longer cones. *T. tanylepis* is a distinctive species, but it may have been overlooked as the type material in Britain (**OXF**) is in very poor condition. However, an isotype at Stockholm, which I have seen, is of much better quality, and it was this specimen that convinced me that *T. tanylepis* is a good species.

89. T. valdedentatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 777 (1923)

Leaves 50–200mm, spreading, dull green; *leaf-lobes 3–4, rather distant, long, narrow, both proximal and distal margins dentate; petiole narrow, green, unwinged.* Scapes 100–250mm, erect; *exterior bracts 8 × 2mm, strongly recurved, pale green,* darker below; *capitulum 35mm,* deep yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, olive-brown. **Fig. 20.**

Waste places, gardens etc., not common and restricted to southern England except for one Welsh record. 10, 12, 15, 17, 20, 22, 23, 37, 47. (9). Endemic.

Although characteristic, this is an undistinguished species which is best known by the rather few, long leaf-lobes, dentate on both margins, and the small, pale, recurved exterior bracts.

90. T. spilophyllum Dahlst., *Ark. Bot.*, **12**(2): 111 (1912)

Leaves 100–250mm, spreading, dark green; leaf-lobes 3–5 (–7), rather distant, recurved, *broad at base, but with characteristic fine and strongly recurved tips, sometimes with ± linear processes,* distal margin of lower lobes filiform-dentate; petiole short, *green,* unwinged or narrowly winged. Scapes 50–150mm, erect; exterior bracts 12 × 3mm, spreading-recurved, green, often suffused with purple; capitulum 50mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 22.**

Steep wet places, e.g. stream-banks, cliffs etc. 62, 66, 67, 84, 99, 101, H12. (6, H1).
British Isles, Norway and Sweden, Br, Hb, No, Su. Native.

Records of this species from the south of England probably represent other species with coloured petioles; however *T. spilophyllum* has almost certainly been overlooked in northern England and Scotland.
This species is distinguished by green petioles and characteristic leaf-lobes, broad at the base but with a fine, recurved apex. The specimen illustrated (Fig. 22) is atypical in lacking this latter character.

91. T. laciniosum Dahlst., *Ark. Bot.*, **9**(10): 20 (1910)

T. naeviferum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 778 (1923)
T. tanyphyllum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 565 (1932)

Leaves 50–200mm, erect, pale mid-green; leaf-lobes 3–6, *regular*, patent or slightly recurved, ± *linear*, proximal margin with long sinuous teeth above; terminal lobe narrow, entire or dentate; *interlobes narrow*, ± *parallel-sided*, with long teeth; *petiole* $\frac{1}{4}$–$\frac{1}{3}$ *length of leaf, green*, narrowly winged or occasionally unwinged. Scapes 80–200mm, erect; *exterior bracts* 9×3*mm, erect-spreading*, dark and *suffused with purple on both sides*; capitulum 55mm, deep yellow; ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. $2n = 26$* (one individual only). Obligate agamosperm. **Fig. 21.**

Waste places; local but widely distributed. 12, 16, 17, 23, 29, 31, 32, 35, 39, 41, 67, 70, 83, 101, 111, S. (15, S). Probably introduced.
Britain and Fennoscandia. (Br), Da, Fe, No, Su.

T. laciniosum is a distinctive species with its narrow, green-petioled leaves with regular, linear lobes and narrow, parallel-sided interlobes, and with erect, purplish exterior bracts. *T. tanyphyllum* is recognised as a distinct species in Scandinavia; although closely related to *T. laciniosum*, Scandinavian material of *T. tanyphyllum* seems to be different, with larger leaves with longer, more recurved and more irregular leaf-lobes, and longer, spreading or recurved exterior bracts. However, the type of *T. tanyphyllum* is from Clifton, Bedfordshire (**OXF**), and this specimen is clearly *T. laciniosum*. A new name seems therefore to be required for the Scandinavian plant.

92. T. cherwellense A. J. Richards, **nom. nov.**

T. stenoglossum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 627 (1929), *non* Brenner, *Meddn Soc. Fauna Flora fenn.*, **34**: 25 (1908)

Leaves 80–200mm, ascending, pale to mid-green; leaf-lobes 3–6, rather regular, patent, *linear*, ± *obtuse*, ± *entire*; terminal lobe usually tripartite; *interlobes parallel-sided*, entire or lobulate; petiole short, *green*, unwinged or very narrowly winged. Scapes 40–150mm, ascending-erect; exterior bracts 10×2mm, *recurved, rather pale green*; capitulum 45mm, yellow; ligules striped grey-purple; styles exserted, discoloured, pollen absent. Achenes 2·8mm, brown. **Fig. 23.**

Gardens, paths, roadsides etc. Southern England; local and uncommon. 7, 17, 23. (3). Endemic.

This species is still to be found, though in small quantity, in the area of north Oxford from which Dahlstedt originally described it. Single records from Wiltshire and Surrey suggest that it may occur elsewhere in southern England. *T. cherwellense* has a distinctive leaf-shape that can only be confused with 91. *T. laciniosum* but this has a totally different involucre.

SPECIES WITH COLOURED PETIOLES (NOS. 93–132)

93. T. aequilobum Dahlst., *Ark. Bot.*, **9**(10): 42 (1910)

Leaves 150–300mm, erect, mid-green; leaf-lobes 5–9, *rather crowded, regular, with divergent, linear processes*, filiform-dentate at base and on interlobes; terminal lobe often *tripartite*; petiole very variable in length, *rose-purple*, unwinged or slightly winged. Scapes 200–350mm, erect; *exterior bracts 10 × 3mm, recurved*, pale green above, very dark below, often purple-tipped; *capitulum 65mm, pale ochre-yellow;* ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. $2n = 24$*. Obligate agamosperm. **Fig. 30.**

Gardens, waste places etc. England and Wales; very local and possibly introduced. 12, 16, 17, 23, 37, 41, 48, 60, 66. (9).
Northern Europe and Switzerland. Be, Br, Da, Fe, He, Ho, No, Su.

T. aequilobum is best known by its narrow leaves with divergent, linear processes; 98. *T. pectinatiforme* usually has more processes, which are both longer and narrower, and lobulate leaves.

94. T. ekmanii Dahlst., *Ark. Bot.*, **10**(6): 19 (1911)

Leaves 150–250mm, ascending, *oblong-lanceolate, wide, pale green; leaf-lobes 2–4*, patent, or slightly recurved, *broad, distal margin ± convex* and dentate; *terminal lobe broad, subdivided and crisped; petiole short, pink, ± winged.* Scapes 200–300mm, erect; exterior bracts 12 × 3mm, spreading-recurved, ± suffused with violet, paler above; capitulum 55mm, deep yellow; ligules striped violet-brown; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 32.**

Grassy places, roadsides etc.; scattered and locally common. 9, 12, 16, 17, 19, 20, 22, 23, 29, 34, 39, 41, 55, 60, 62, 66, 67, 75, 112, S. (19, S). Native.
Western and northern Europe, extending south-east as far as Switzerland and northern Italy. Au, Be, Br, Da, Fe, Ga, Ge, He, Ho, Hs, It, Lu, No, Rs(B), Su.

T. ekmanii is one of the more widespread species in this section. Its leaves can only be confused with those of 70. *T. ancistrolobum*, which, however, has green petioles, and with certain shade forms of other species. These latter usually show signs of etiolation (chlorosis; pale, elongated scapes and petioles; few flowers) and have more or less entire juvenile leaves.

95. T. porrectidens Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 563 (1932)

T. recurvilobum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 564 (1932)
T. submucronatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 565 (1932)

Leaves 150–300mm, ascending, *narrow*, pale green; *leaf-lobes 4–9, slightly recurved, short, narrow, entire or slightly dentate*; terminal lobe short, triangular; *petiole about ¼ length of leaf, red-purple, usually unwinged.* Scapes 200–300mm, erect; exterior bracts 12 × 2mm, recurved, pale green above, darker below; capitulum 45mm, deep yellow; ligules striped *dark violet*; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 26.**

Waste places, roadsides etc.; widely distributed but uncommon. 9, 11, 17, 19, 20, 24, 26, 29, 30, 41, 53, 99. (12). Endemic.

T. porrectidens is a species with narrow, pale leaves of a characteristic shape, and narrow, pale, rather long exterior bracts.

96. T. biforme Dahlst., *Ark. Bot.*, **9**(10): 63 (1910)

Leaves 70–200mm, ascending, pale, often *yellowish green*; leaf-lobes usually 4, rather distant, *recurved, narrow, ± parallel-sided, or distal margin convex*, ± entire; terminal lobe narrow, *attenuate*, ± subdivided; *interlobes narrow, parallel-sided*, entire or filiform-dentate; petiole ¼ length of leaf, *broad, wine-coloured, unwinged or almost so.* Scapes 70–200mm, ascending-erect; exterior bracts 12 × 2mm, pale green above, darker below; capitulum 50mm, deep yellow; ligules striped dark violet; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 27.**

Roadside at Littlemore, Oxford. 23. (1). Very probably introduced.
England and Fennoscandia. (Br), Da, Fe, No, Su.

This species has a very distinctive leaf-shape, which cannot be confused with any other British species. It is clearly closely related to 95. *T. porrectidens* with which it agrees in every other respect. The Scandinavian species *T. boldtii* H. Lindb. f. and *T. interruptum* Dahlst. are rather similar in leaf-shape, but differ in other characters.

97. T. copidophyllum Dahlst., *Ark. Bot.*, **9**(10): 25 (1910)

Leaves 150–300 × 30–50mm, erect, *very narrow*, rather *dark green*; leaf-lobes 2–4, *distant, somewhat recurved, long, narrow, distal margin strongly-dentate; terminal lobe usually ¼–½ length of leaf, narrow, entire, dentate or subdivided; petiole ¼–½ length of leaf, narrow, purple, unwinged.* Scapes 200–350mm, erect; *exterior bracts 9 × 3mm, erect, rather pale green*, often with a *wide but indistinct border*; capitulum 45mm, deep yellow; ligules striped *red-purple*; styles exserted, discoloured, pollen present. Achenes 3·2mm, brownish. **Fig. 34.**

Grassy places. Berkshire, Warwickshire and Jersey; rare. 22, 38, S. (2, S). Almost certainly introduced.
Northern Europe. Be, (Br), Da, Fe, Ho, No, Po, Su.

This is a most distinctive species, both in leaf-shape and involucre. The only

possible confusion is with the rare Spectabilia species 40. *T. acrifolium*, which has a similar leaf-shape and erect exterior bracts, but the latter species is smaller and darker, usually the leaves are spotted, the involucre is much darker and the achenes are larger.

98. T. pectinatiforme H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 30 (1907)

Leaves 100–300mm, ascending, dull green; *leaf-lobes 6–12(–20), pointing forward, patent or recurved, linear and entire, except for the wider base the distal margin of which is usually convex and filiform-dentate*; terminal lobe with a narrow apex, often ± *tripartite*; interlobes short, dentate and lobulate; *petiole very short, dull reddish-purple,* ± *unwinged.* Scapes 100–300mm, erect; *exterior bracts 10 × 2mm, recurved,* pale green above, darker below, sometimes suffused reddish; capitulum 50mm, pale yellow; styles exserted, discoloured, pollen present. *Achenes 3·5mm,* straw-coloured. **Fig. 23.**

Waste places etc., Somerset, Gloucestershire and Cambridgeshire; local and rare. 5, 29, 34. (3). Almost certainly introduced.
Northern and central Europe. Be, (Br), Da, Fe, Ga, Ge, He, Ho, No, Rs(B), Su.

In typical forms the leaf-shape is remarkable and quite unmistakable with many long, very narrow, linear processes. Deviating forms can approach 93. *T. aequilobum* in leaf-shape, but they always have lobules, and the base of the distal margin of the leaf-lobes is usually convex. The achenes are amongst the largest in this section.

99. T. aurosulum H. Lindb. f., *Meddn Soc. Fauna Flora fenn.*, **35**: 14 (1909)

Leaves 150–300mm, erect, dull green; *leaf-lobes 5–7, recurved, lower lobes broad at base tapering to narrow apex, distal margin convex and strongly dentate at base,* upper lobes long, linear, distal margin entire; petiole dull purple, narrowly winged. Scapes 150–300mm, erect; *exterior bracts 12 × 5mm, spreading,* green, darker below, sometimes purplish; *capitulum 60–70mm, yellow*; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0 × 1·2mm, *plump,* straw-brown. **Fig. 28.**

Roadsides and grassy places. Widely distributed and locally common, but not recorded from Ireland. 17, 22–24, 29, 48, 60, 62, 66, 98, 101, S. (11, S). Probably native and doubtless considerably under-recorded, but nevertheless absent from large areas with apparently suitable habitats.
Northern Europe and Switzerland. Be, Br, Da, Fe, Ga, He, Ho, No, Su.

T. aurosulum is distinguished by its recurved leaf lobes with ± linear apices, large involucres and capitula and very wide exterior bracts.

100. T. xanthostigma H. Lindb. f., *Meddn Soc. Fauna Flora fenn.*, **36**: 5 (1910)

Leaves 100–250mm, erect, green or sometimes ± glaucous, usually with dark

blotches on the interlobes; leaf-lobes 3–5, patent, ± deltoid, distal margin dentate; terminal lobe often *large*, *wide*, obtuse, entire or subdivided once; petiole ¼–⅓ length of leaf, purple, winged. Scapes 200–300mm, erect; exterior bracts 10 × 3mm, recurved, pale green, darker below; capitulum 45mm; ligules striped grey-purple; styles exserted, *yellow in fresh and dried condition*, pollen present. Achenes 3·0mm, straw-brown. **Fig. 18.**

Roadsides and grassy places; chiefly in southern England and the Channel Isles but recently discovered in Northumberland. 17, 22, 23, 26, 29, 67, S. (6, S). Possibly introduced.
Native in Fennoscandia; less common in north-west and central Europe where it is probably introduced. Be, Br, Da, Fe, Ge, He, Ho, No, Rs(B), Su.

This species is most readily recognised by its yellow styles. It is separated from 88. *T. tanylepis* and 107. *T. duplidens* by having pollen, and from these and 130. *T. privum* by the distinctive leaf-shape.

101. T. mucronatum H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 24 (1907)

T. latispina Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1922*, **6**: 780 (1923)
T. atromarginatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 623 (1929), *nomen nudum*, *non* H. Lindb. f., *Sched. Pl. Finland. Exsicc., Helsingfors*, **21–42**: 118 (1944)

Leaves 150–300mm, erect, dull green; leaf-lobes 3–5, patent or slightly recurved, tapering from a rather broad base *to a fine, acuminate apex*, entire or with 1 or 2 long teeth near the base of the distal margin; terminal lobe rather short, triangular; petiole purple, winged or scarcely so. Scapes 200–300mm, erect; exterior bracts 12 × 2·5mm, spreading to recurved, suffused with purple; capitulum 45mm, deep yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. **Fig. 31.**

Roadsides and grassy places, usually in some shade; local in the Thames valley area. 17, 22–24. (4). Native.
England, Finland and southern Sweden. Br, Fe, Su.

It is remarkable that this local species should occur as a native in a small area of southern England and nowhere else outside Fennoscandia. There seems little doubt that the British plant is correctly identified. Dahlstedt and Lindberg have both assigned British material to this species, and I can find no difference between British and Scandinavian plants. *T. mucronatum* occurs in fairly natural habitats in a limited area in Britain and, apart from its geographical isolation, there is no reason to doubt that it is native. It is best known by the characteristic leaf-shape and rather long and narrow, purplish exterior bracts.

102. T. dilatatum H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 22 (1907)

Leaves 100–250mm, spreading (to erect), dull, *somewhat yellowish-green*; *leaf-*

lobes 2–5, rather distant, recurved, long and acute, distal margin with small and large teeth; leaf-margins, especially of interlobes, sometimes blackish; terminal lobe rather narrow, subdivided; interlobes with long, broad-based, filiform teeth; petiole about ¼ length of leaf, purple, winged. Scapes 50–200mm, spreading to erect; *exterior bracts 15 × 2–3mm*, spreading to recurved, pale green above, darker below; *capitulum 60–70mm, deep yellow*; ligules very long, striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, olive-brown. **Fig. 34.**

Roadsides and grassy places; widespread but local, though probably overlooked; not recorded from Ireland. 7, 11, 13, 22, 23, 25, 29, 31, 32, 35, 39, 59, 60, 62, 66, 67, 75, 79, 91, 105, 112, S. (21, S). Native.
Northern Europe, extending into southern France and Germany. Be, Br, Da, Fe, Ga, Ge, Ho, No, Rs(B), Su.

This is the only species combining the following characters: only 2–5 recurved leaf-lobes, long, narrow, recurved exterior bracts and a capitulum of over 60mm diameter. Yet it is not a distinctive species being readily confused with other species, in particular with the following three (nos. 103–105) from which it is best known by the large capitulum.

103. T. cordatum Palmgr., *Acta Soc. Fauna Flora fenn.*, **34**(1): 12 (1910)

T. amblycentrum Dahlst., *Ark. Bot.*, **10**(11): 37 (1911)

Leaves 100–200mm, spreading to erect, *rather pale, pure green*, lacking dark markings; leaf-lobes 3–5, patent, or usually slightly recurved, narrowly triangular, acute, distal margin usually somewhat concave, lower part of distal margin filiform-dentate; terminal lobe triangular, entire; petiole dull red, narrowly winged. Scapes 100–200mm, erect; exterior bracts 10 × 3mm, spreading, suffused with violet, or pale green above, darker below; capitulum 45mm, deep yellow; ligules striped red-purple; styles exserted, discoloured, pollen present. Achenes 3mm, olive-brown. $2n = 23$, 24*. Obligate agamosperm. **Fig. 33.**

Road-verges and grassy places; rather common and doubtless under-recorded. 16, 17, 20, 22–24, 27, 29, 32, 48, 52, 58, 60, 62, 66, 67, 75, 83, 101, 103, 106, H9, S. (21, H1, S). Native.
Northern and western Europe. Be, Br, Da, Fe, Ga, Ge, Hb, Ho, Hs, No, Rs(B), Su.

Experiments at Rothamsted suggest that *T. cordatum* grows best in high-yielding pastures with a low pH (*c* 5) and high potassium levels.
T. cordatum is an attractive but nevertheless not a very distinctive species. With the exception of the next species, 104. *T. adsimile*, it is best distinguished from species with a similar leaf-shape by the pure green, unmarked leaves. *T. adsimile* has more recurved leaf-lobes with straight or convex distal margins.

104. T. adsimile Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 622 (1929)

T. connexum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 26 (1930)
T. subsagittipotens Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 26 (1930)

Leaves 100–200mm, erect, *dark, pure green*; leaf-lobes 3–6, recurved, acute, *distal margin straight* or ± convex, *entire* or ± dentate; terminal lobe triangular, sometimes attenuate, subdivided; *petiole* ¼–½ *length of leaf, dull purple*, narrowly winged. Scapes 100–200mm, erect; exterior bracts 10 × 2·5mm, spreading to recurved, often suffused with purple; capitulum 40mm; ligules striped violet-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 31.**

Waste-places, gardens, paths etc. Scattered but very local in England and Wales; Ayrshire. 12, 20–24, 26, 29, 39, 40, 45, 75. (12). Endemic.

Although stated in the type description to have yellow stigmas, the type specimens of *T. subsagittipotens* do in fact have discoloured stigmas, as do specimens of *T. adsimile*. I have only recently established the fact that these two species and also *T. connexum* are conspecific. Most previous determinations of British material have been under *T. subsagittipotens*.
This species is best recognised by the dark, pure green leaves, the regular, recurved, triangular leaf-lobes, purplish exterior bracts and rather small capitula.

105. T. longisquameum H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 21 (1907)

T. sagittatum Dahlst., *Ark. Bot.*, **10**(11): 49 (1911), *non* H. Lindb. f., *ined., nom. in herb.*

Leaves 70–200mm, decumbent to erect, *dark green, with purple blotches on the interlobes*; leaf-lobes 3–5, *slightly to strongly recurved, triangular, acute, ± straight-sided* and dentate, often on both margins; terminal lobe narrowly triangular-acute, subdivided; petiole ¼ length of leaf, purple, unwinged or almost so. Scapes 100–230mm, erect; exterior bracts 10 × 2mm, recurved (to spreading), pale green above, darker below, sometimes suffused with purple; capitulum 45mm, yellow; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. $2n = 24$*. Obligate agamosperm. **Fig. 29.**

Grassy places, roadsides etc. Locally common throughout much of the British Isles. 9, 17, 19, 20, 22–24, 29, 32, 35, 39, 41, 47, 48, 51–53, 55, 58, 60, 62, 99, 101, 108, H16. (24, H1). Native.
Northern Europe extending south to Switzerland. Be, Br, Da, Fe, Ge, Hb, He, Ho, No, Rs(B), Su.

Experiments at Rothamstead Experimental Station suggest that *T. longisquam-*

eum grows best in rather high-yielding pastures of pH 5–7, and low calcium levels.
T. longisquameum is best known by the few, triangular, recurved leaf-lobes, dark purplish interlobes and rather long, narrow exterior bracts. It is an early flowering species.

106. T. dahlstedtii H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 27 (1907)

T. densiflorum M.P. Chr. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 315 (1934), *non* Brenner, *Meddn. Soc. Fauna Flora fenn.*, **33**: 75 (1907)

Leaves 70–200mm, *mid- or pale, pure green*; leaf-lobes 4–6, patent, or slightly recurved, narrow and rather short, the base decurrent and usually dentate; *terminal lobe longer*, usually *dentate or subdivided; petiole narrow, vivid crimson-purple*, unwinged. Scapes 100–250mm, erect; *exterior bracts 12 × 2mm, recurved, pale green above*, darker below; capitulum 40mm, pale yellow; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. $2n = 24^*, 27^*$. Obligate agamosperm. **Fig. 31.**

Grassy places, roadsides etc. Widespread and locally common; not recorded from Ireland but certainly considerably under-recorded. 15, 17, 19, 22, 23, 26, 27, 29, 35, 36, 38, 39, 45, 49, 59, 60, 62, 66, 68, 75, 90–92, 94–96, 99, 105, 106, S. (29, S). Native.
Northern Europe. Be, Br, Da, Fe, Ga, Ge, Ho, Is, No, Rs(B, N), Su.

This is a rather common, characteristic and attractive species, most readily identified by the pale, pure green leaves, the narrow, vivid petioles and the rather large subdivided terminal leaf-lobe.

107. T. duplidens H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 38 (1907)

Leaves 50–180mm, narrow, dull, rather dark green; leaf-lobes 3–6, *recurved, short, acute*, distal margin somewhat *convex*, with *one tooth*; *terminal lobe very small*, triangular; petiole purple, unwinged or narrowly winged. Scapes 70–200mm, ascending to erect; *exterior bracts 9 × 2mm, recurved, pale, often glaucous above*, dark below; capitulum 40mm, convex, deep yellow; ligules striped grey-violet; styles exserted, *yellow in fresh and dried condition, pollen absent*. Achenes 2·8mm, brown. $2n = 24^*$. Obligate agamosperm. **Fig. 18.**

Waste places, gardens, walls, paths etc. Widely distributed but local; not recorded from Ireland. 3, 12, 17, 20, 23–25, 27, 29, 31, 41, 45, 62, 67, 86, 95, 98, S. (17, S). Probably native.
Northern Europe extending south to Switzerland; introduced in Iceland. Be, Br, Da, Fe, Ga, Ge, He, Ho, (Is), No, Rs(B, N), Su.

With the exception of the very rare 88. *T. tanylepis*, this is the only species in this section without pollen and with yellow styles. *T. tanylepis* differs in having narrow, patent leaf-lobes.

THE *T. HAMATUM* GROUP (NOS. 108-118)

108. T. melanthoides Dahlst., *Bot. Not.*, **1935**: 309 (1935)

T. melanthoides Dahlst. ex Hagl., *Bot. Not.*, **1934**: 389 (1934), *nomen nudum*

Leaves 50–180mm, spreading to erect, *pale, bluish-green*; leaf-lobes 3–5, slightly recurved, *rather short*, distal margin and interlobes dentate, the latter usually with *black or purple blotches*; terminal lobe longer, ± *helmet-shaped*, dentate below; petiole purple, narrowly winged. Scapes 100–250mm, ascending to erect; *exterior bracts 12 × 4mm*, recurved, *purplish* above, dark green below; capitulum 45mm, deep yellow; ligules striped dark purple-brown; styles exserted, discoloured, pollen present. Achenes 3·0mm, brown. **Fig. 28.**

Water meadows, especially when mown for hay (meads) but less fertile than those in which the other Thames Valley mead species are found (85. *T. subundulatum*, 86. *T. sublaeticolor*, 109. *T. tamesense* and 110. *T. fulgidum*). Only definitely known from the Thames Valley, the R. Blackwater, north Hampshire and Jersey. 12, 22, 23, 29?, S. (4, S). Native.
England, southern Scandinavia, the Netherlands and Belgium. Be, Br, Da, Ho, No, Su.

This is the only member of the *T. hamatum* group with the combination of pale bluish leaves, blotched interlobes and purplish exterior bracts.

109. T. tamesense A. J. Richards, **sp. nov.** (see p. 98)

Leaves 40–150mm, erect, dark green, *with irregular purple blotches, especially on the interlobes; leaf-lobes* (0)2–3, *recurved, very short, wide, acute or* ± *obtuse*, upper lobes entire on distal margin; petiole ⅓–½ length of leaf, *bright purple*, unwinged. Scapes 100–150mm, erect, slender; *exterior bracts 8 × 2mm, spreading to erect*, dark green, *suffused with purple; capitulum 35mm*, deep yellow; ligules striped *purple*; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. **Fig. 27.**

Water-meadows mown for hay (meads); only known from Pixey Mead, Oxford and by the R. Blackwater, north Hampshire. 12, 23. (2). Native.
England and Fennoscandia. Br, Da, Fe, No, Su.

This is a most attractive little species with purplish leaves, bright purple petioles, and erect exterior bracts. With the two next species, 110. *T. fulgidum* and 111. *T. haematicum*, this species may represent a link with the section Spectabilia, with which all the *T. hamatum* group seem to have affinities.

110. T. fulgidum Hagl., *Bot. Not.*, **1938**: 504 (1938)

Leaves 80–200mm, spreading to erect, *pale, pure green, sometimes with dark spots or blotches on the interlobes*; leaf-lobes 2–3, ± patent, rather short,

triangular, distal margin strongly toothed; *terminal lobe rounded, entire above; petiole ¼–½ length of leaf, shining, bright purple, winged.* Scapes 100–250mm, erect, rather slender, purple, at least at the base and below the capitulum; *exterior bracts 10 × 3mm, spreading to erect, stiff, dark green below*, paler above, often purple-tipped; capitulum 50mm, deep yellow; ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 3·5mm, olive-straw coloured. **Fig. 27.**

Water-meadows mown for hay (meads) in the Oxford area. 23. (1). Native. England, Fennoscandia, the Netherlands and Belgium. Be, Br, Da, Fe, Ho, No, Su.

Although this species may eventually be found on other meads, especially in the Thames Valley, it is unlikely to have been extensively overlooked as it is very distinctive.
T. fulgidum has strong affinities with the section Spectabilia to which it may well belong. In this section it particularly resembles 42. *T. euryphyllum* but differs in having a rounded terminal leaf-lobe. 48. *T. drucei* has smaller, paler exterior bracts, grey stripes to the ligules and yellow styles. In the section Vulgaria, *T. fulgidum* is readily recognised as the only species with rounded terminal leaf-lobes and with spreading to erect exterior bracts. The leaf spots (when present), very bright purple petioles and large achenes are also diagnostic.

111. T. haematicum Hagl. in Hagl. & Morander, *Svensk bot. Tidskr.*, **31**: 347 (1937), *sine diag. lat.*

T. haematopus Dahlst. in Lindman, *Svensk Fanerogamfl.*, 563 (1918), *non* H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 25 (1907)
T. haematopodides H. Lindb. f., *Acta bot. fenn.*, **17**: 18 (1935), *nomen nudum*

Leaves 80–100mm, *spreading to erect*, dark, pure green, *usually with dark blotches on the interlobes*; leaf-lobes 4–5, patent or slightly recurved, narrowly triangular, distal margin ± concave, entire or filiform-dentate; terminal lobe small, triangular; *petiole ¼–½ length of leaf, bright purple*, unwinged. Scapes 50–200mm, erect, often purplish at base; *exterior bracts 10 × 3–4mm, spreading, rather dark green below*, pale above, often purplish, especially at tips and margins; capitulum 40mm, deep yellow; ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 3·2mm, olive-brown. $2n = 24$. Obligate agamosperm. **Fig. 34.**

Water meadows mown for hay (meads); rarely in other wet, lowland sites. Valleys of the Blackwater, north Hampshire, and Thames; Wicken Fen, Cambridgeshire; Isle of Man and Ayrshire. 12, 22, 23, 29, 71, 75. (6). Native. Northern and central Europe. Be, Br, Da, Fe, Ge, He, Ho, It, No, Su.

This species is the commonest of the 'mead species', both in Britain and elsewhere. It shares with 109. *T. tamesense* and 110. *T. fulgidum* strong affinity with the section Spectabilia. It is best known by the long, narrow, bright purple petioles, and leaf-lobes with a concave distal margin.

There is a problem with the name *T. haematicum* Hagl. as it uses *T. haematopus* Dahlst. in Lindman as the basionym, and it is not clear whether the latter is a later homonym or a misinterpretation of Lindberg's species. Assuming the former, the name can stand, but if the latter is correct a new name will have to be found. For the present, the name *T. haematicum* is retained until the original material can be consulted and a Latin diagnosis drawn up.

112. T. christiansenii Hagl. in Hylander, *Förteckn. Skand. Växter* (*Lund Bot. För.*), **1**: 157 (1941)

T. marginellum M.P. Chr. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 306 (1934), *non* H. Lindb. f., *Acta Soc. Sci. fenn.*, nov. ser. B, **1**(2): 171 (1932)

Leaves 150–250mm, spreading to erect, *dull, dark green*; leaf-lobes 4–5, recurved, triangular, distal margin usually somewhat convex, entire or filiform-dentate; petiole about $\frac{1}{4}$ length of leaf, dull purple, narrowly winged. Scapes 150–300mm, erect; exterior bracts 12 × 3mm, spreading to recurved, *dull, somewhat glaucous green, with a clear white border about half as wide as the green centre*; capitulum 45mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. $2n = 24$. Obligate agamosperm. **Fig. 33.**

Grassy places, roadsides etc. Dorset, Lancashire, Yorkshire and Argyllshire. 9, 60, 62, 98. (4). Very probably introduced.
Britain, Scandinavia, the Netherlands and Belgium. Be, (Br), Da, Ho, No, Su.

In leaf characters this species is intermediate between 113. *T. bracteatum* and 114. *T. hamatum*. It is readily distinguished from both by the smallish, pale, spreading exterior bracts with wide, hyaline borders.

113. T. bracteatum Dahlst., *Ark. Bot.*, **19**(18): 11 (1925)

Leaves 100–250mm, spreading to erect, dull, mid-green, sometimes with a few dark blotches on the interlobes; leaf-lobes 3–5, *slightly recurved*, rather short, broadly triangular, distal margin usually somewhat convex, entire or filiform-dentate; terminal lobe medium-sized, triangular; petiole purple, unwinged, at least at the base. Scapes 50–200mm, erect, often reddish; *exterior bracts 10 × 3mm, erect, the outermost smaller 5 × 1mm, spreading or recurved*, dark green outside, paler within, *often somewhat reddish*, all unbordered; capitulum 45mm; ligules striped purple; styles exserted, discoloured, pollen present. *Achenes 3·5mm*, straw-coloured. $2n = 24$*. Obligate agamosperm. **Fig. 29.**

Grassy places, roadsides etc.; widely distributed throughout Britain but rather uncommon. 3, 10, 17, 22, 23, 38, 41, 57, 60, 62, 66–68, 90, 96, 103, 111, S. (17, S). Probably native.
Northern and central Europe. Be, Br, Da, Fe, Ga, Ge, He, Ho, No, Su.

T. bracteatum can be separated from all except 114. *T. hamatum* by leaf

characters and the large achenes. The latter species usually has more strongly recurved and more convex leaf-lobes, and darker, more glaucous exterior bracts.

114. T. hamatum Raunk., *Dansk Ekskurs.-Fl.*, 2nd ed., 255 (1906)

T. pseudohamatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 564 (1932), *pro parte*

Leaves 80–300mm, decumbent to erect, dull, dark green, sometimes suffused purple; leaf-lobes 3–5, recurved, triangular, rather short, acute or *sometimes obtuse*, distal margin convex, entire or filiform-dentate; terminal lobe variable, usually rather small and triangular; petiole *c* $\frac{1}{4}$ length of leaf, dull purple, unwinged, at least below. Scapes 100–300mm, erect; *exterior bracts c 11 × 3mm, erect* to spreading, *very dark, glaucous green outside*, somewhat paler *within, the outermost not noticeably narrower, unbordered*; capitulum 50mm, deep yellow; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·5mm, straw-coloured. $2n = 24$*. Obligate agamosperm. **Fig. 28.**

Grassy places, roadsides, scrub, waste-land, gardens, rocky places etc. Locally common in the south, very common and usually the most abundant species in lowland northern England and Scotland except the extreme north and west; apparently absent from Ireland. 1, 3, 7, 12, 15–17, 19–24, 29, 32, 35, 36, 38, 39, 41, 45, 49–51, 55, 57, 58, 60, 62, 64, 66–70, 75, 77, 83, 86, 88, 90, 96, 98, 99, 101, 102, 106, 108, 112, S. (49, S). Native.
Northern Europe. Be, Br, Da, Fe, Ga, Ge, Ho, No, Su.

T. hamatum is best separated from the remainder of this group of species (nos. 108–118) by the large achenes and erect, dark, glaucous exterior bracts. Although plastic, it is a distinctive species which can often be recognised at a glance by its leaf-shape.

115. T. hamatiforme Dahlst. in Lindman, *Svensk Fanerogamfl.*, 583 (1918)

T. hamatifrons Dahlst. in Johnston., *Trans. Proc. bot. Soc. Edinb.*, **29**: 302 (1926)

Leaves 80–200mm, spreading to erect, dull green, sometimes with dark blotches on the interlobes; leaf-lobes 3–5, somewhat *recurved*, rather short, triangular, acute, distal margin convex, or sometimes straight on the lower lobes, lower lobes often with filiform teeth; terminal lobe triangular; petiole purple, unwinged, or winged above. Scapes 80–200mm, ascending to erect; *exterior bracts 10 × 3mm, spreading, dark green below*, paler and somewhat *glaucous* above, unbordered; capitulum 45mm, deep yellow; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. $2n = 23$*, 24*, 25*, 26*, 27*. Obligate agamosperm. **Fig. 29.**

Grassy places, roadsides, hedgebanks etc., more rarely in waste places. Locally common in Britain; in Ireland only known from Co. Kerry, but perhaps more

widespread. 1, 3, 11, 12, 15–18, 22–24, 26, 28, 29, 39, 41, 44, 45, 48, 49, 54, 58, 60, 62, 67, 75, 96, 98–101, 107, 111, H1, S. (33, H1, S). Native.
Northern Europe. Be, Br, Da, Fe, Ga, Ge, Hb, Ho, Hs, No, Su.

Experiments at Rothamstead Experimental Station demonstrate a preference for poor pastures with a pH of about 5, and low nitrogen and phosphorus levels.
T. hamatiforme is in the most critical area of the *T. hamatum* group, for 116. *T. marklundii*, and the non-British species *T. kernianum* van Soest, *T. atrovirens* Dahlst. and *T. atactum* Sahlin & van Soest are all separable only with difficulty. The taxonomy of these is far from clear, and it is doubtful if it will ever be entirely satisfactory. Genotypes assigned to these species are evidently rather successful in western Europe and selection for single genotypes seems not to have occurred. All the genotypes examined are agamospermous and in any one area individuals tend to be relatively uniform. *T. marklundii* differs from *T. hamatiforme* in leaf-shape, the lobes being longer, more recurved and more strongly dentate and, characteristically, the terminal lobe is small with an acuminate apex; the exterior bracts are usually purplish.

116. T. marklundii Palmgr., *Acta Soc. Fauna Flora fenn.*, **34**(1): 20 (1910)

T. hamiferum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 625 (1929), *pro parte*
T. subhamatum M.P. Chr., *Bot. Tidsskr.*, **43**: 238 (1935), *nomen nudum*
T. subhamatum M.P. Chr., *Dansk bot. Ark.*, **9**(2): 26 (1936)

Leaves 50–200mm, spreading to erect, dull green, often dark and sometimes suffused with purple; leaf-lobes 4–5 (–6), *recurved, rather narrow, distal margin convex*, usually filiform-dentate, and sometimes with *1–2 large teeth; terminal lobe small*, triangular, *acuminate*; interlobes sometimes with dark blotches, dentate; petiole dull purple, usually winged. Scapes 50–200mm, ascending to erect; *exterior bracts 10 × 2·5mm, spreading, purple above, dark green suffused with purple beneath*, unbordered; capitulum 45mm; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·0mm, straw-brown. $2n = 24$*. Obligate agamosperm. **Fig. 26.**

Grassy places, especially roadsides and poor pastures. The commonest and often the only species of poor or overgrazed pasture in England, and very under-recorded; much more local in Scotland; in Ireland only recorded from Co. Galway, but very probably widespread. 3, 9, 12, 17, 19, 20, 22–24, 26, 28, 29, 31, 39, 41, 45, 46, 52, 58, 60, 62, 66, 67, 96, 98, 99, 101, 106, H16, S. (28, H1, S). Native.
Northern and western Europe. Be, Br, Da, Fe, Ga, Ge, Hb, Ho, Hs, Lu, Rs(B), Su.

Experiments at Rothamstead Experimental Station indicate a preference for poor pastures with a pH of 5–7 and low mineral content, apart from nitrogen. This species is closely related to 115. *T. hamatiforme* and 117. *T. latisectum*. The latter is best known by the larger terminal leaf-lobes and the small, pale, recurved exterior bracts. 118. *T. oblongatum* has a somewhat different leaf-

shape and paler leaves, while 119. *T. maculatum* has pure green, heavily blotched leaves. *T. marklundii* appears to flower a few days in advance of other Vulgaria species.

117. T. latisectum H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 26 (1907)

T. subdilatatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1927*, **8**: 309 (1928), *nomen nudum*

Leaves 100–300mm, erect, dull, mid-green; leaf-lobes 3–6, *slightly recurved, broadly triangular*, distal margin usually somewhat *convex*, entire or filiform-dentate; terminal lobe *small*, triangular, *narrow on early leaves, larger and obtuse on later leaves*, entire; *interlobes unblotched*, entire; petiole dull purple, winged. Scapes 100–350mm, erect; *exterior bracts 9×2mm*, spreading to *recurved, pale, uniformly green and somewhat glaucous above*, darker below, unbordered; capitulum 45mm; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 2·8mm, straw-brown. **Fig. 29.**

Grassy places; local but probably under-recorded due to confusion with 115. *T. hamatiforme*. 22, 23, 28, 29, 41, 45, 60, 99, 101, H1, 16, S. (9, H2, S). Native. British Isles and Fennoscandia. Br, Da, Fe, Hb, No, Su.

The leaves of *T. latisectum* resemble those of large, broad-lobed forms of 115. *T. hamatiforme*, although neither of the two types of terminal lobe occurring in *T. latisectum* is found in that species. *T. hamatiforme* is also characterised by larger, darker and less glaucous exterior bracts.

118. T. oblongatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 27 (1930)

T. hamiferum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 625(1929), *pro parte*
T. perhamatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 28 (1930)
T. pseudohamatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1931*, **9**: 564 (1932), *pro parte*
T. fusciceps Hagl., *Bot. Not.*, **1938**: 505 (1938)

Leaves 50–200mm, erect, mid-green, or even *yellowish*; leaf-lobes 3–5, *recurved, distal margin usually convex* and filiform-dentate; *terminal lobe longer than adjacent lateral lobes, often entire, obtuse, minutely apiculate, with a convex margin*; petiole deep pink, unwinged or narrowly winged. Scapes 100–250mm, erect; *exterior bracts 9×2·5mm, spreading to recurved, suffused with purple above*, very dark green below; capitulum 35–40mm, strongly convex; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, straw-brown. $2n = 24$*. Obligate agamosperm. **Fig. 26.**

Grassland, especially fertile, damp pastures. Scattered in England and Wales; Arran, Channel Isles. 1, 9, 20, 22–24, 31, 41, 44, 45, 62, 66, 100, S. (13, S). Probably native.
Britain, Sweden, Finland and the Netherlands; possibly also in Norway. Br, Fe, Ho, No?, Su.

There has been some difficulty over the identity and correct name of this species. It has been known for some time that Haglund's *T. fusciceps* was the same as material earlier described from Britain as *T. oblongatum*. Unfortunately, the holotype of the latter at Oxford is heterotypic, comprising poor material which may be the same as *T. fusciceps*, as well as *T. obliquilobum*. However, the isotype at Stockholm is clearly *T. fusciceps*, as is the other material at Oxford collected in the same year from Notley Abbey, Buckinghamshire and named by Dahlstedt *T. oblongatum*. There is no doubt therefore that the two names are synonymous. Owing to the earlier confusion, the synonym *T. perhamatum*, for which the type locality is also Notley Abbey, has previously been used for British material.
T. oblongatum is a species with rather pale leaves and recurved exterior bracts suffused with purple; the leaf-shape is usually distinguishable from allied species.

119. T. maculatum Jordan, *Pug. Pl. Nov.*, 117 (1852)

T. atripictum Markl. ex Pettersson, *Memo. Soc. Fauna Flora fenn. for 1933–1934*, **10**: 221 (1935), *nomen nudum*
T. atripictum Markl., *Acta bot. fenn.*, **23**: 91 (1938)

Leaves 80–250mm, decumbent to erect, *pure green, blotched with purple on the interlobes and often elsewhere*; leaf-lobes 3–6, *recurved, distal margin convex* and usually with large teeth, occasionally also dentate on the *proximal margin* and interlobes; *terminal lobe small, triangular, obtuse-apiculate; petiole dark red,* unwinged or narrowly winged, mid-rib also usually a *distinctive dark red.* Scapes 20–180mm, ascending to erect, *often scarcely* $\frac{1}{2}$ *length of leaves at anthesis*, although sometimes exceeding the leaves later; *exterior bracts* 9×2*mm, recurved, pale, glaucous green* above, dark green below, sometimes suffused with purple; capitulum 50mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 28.**

Roadsides and grassy places. Uncommon and confined to England and south Wales. 9, 12, 17, 20, 22–24, 41, 45, 62, 67, S. (11, S). Probably native.
Britain and Fennoscandia; possibly also in France. Br, Fe, Ga?, No, Su.

T. maculatum is best known by the combination of green, dentate leaves with purple or black interlobes, a red petiole and mid-rib, recurved leaf-lobes and rather small, recurved exterior bracts. It is commonly found in flower 1–2 weeks before most Vulgaria species.

120. T. fasciatum Dahlst. in Sernander *et alia, Bot. Studier till. F. R. Kjellman*, 172 (1906)

T. sublatissimum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 28 (1930)

Leaves 100–250mm, spreading to erect, mid-green *with blackish interlobes*; leaf-lobes 3–5, pointing forward, patent or recurved, narrowly triangular, entire, or, like the interlobes, with long, filiform teeth; *terminal lobe subsagittate,*

often abruptly narrowed near the middle; petiole dull reddish purple, winged. Scapes 100–300mm, erect; *exterior bracts 14 × 4mm, recurved, crowded, ± imbricate, broad, pale green above*, dark green below, sometimes somewhat suffused with purple; capitulum 50mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 2·8mm, olive-brown. $2n = 24$. Obligate agamosperm. **Fig. 30.**

Grassy places, roadsides, waste places; scattered throughout Britain but rather uncommon. 6, 12, 20, 22, 23, 27, 29, 32, 34, 39, 60, 62, 67, 82, 83, 96, 106, 109, S. (18, S). Possibly native.
Northern Europe. Be, Br, Da, Fe, Ge, Ho, No, Rs(B), Su.

T. fasciatum is very common throughout most of its range and is one of the commonest species in Scandinavia. Its relative scarcity in Britain may be due to its apparent dislike of Atlantic conditions (it is absent from south-west England, Wales, and Ireland), but it may be introduced.
This species is best recognised by its involucre of wide, imbricate, pale green exterior bracts. The dark interlobes, variously directed leaf-lobes and the shape of the terminal lobe are also characteristic.

121. T. duplidentifrons Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 624 (1929)

T. duplidentiforme Dahlst. ex Druce, *Rep. botl Soc. Exch. Club Br. Isl. for 1927*, **8**: 308 (1928), *nomen nudum*
T. raunkiaerii Wiinst. in Raunk., *Dansk Ekskurs.-Fl.*, 5th ed., 303 (1934)

Leaves 50–200mm, spreading to erect, dull green, without dark markings; leaf-lobes 3–5, patent or slightly recurved, *rather short and broadly triangular, tapering abruptly to an acute or acuminate tip*, distal margin usually filiform- and *triangular-dentate*; terminal lobe triangular, acute, usually entire; *petiole dark red (—purple)*, usually winged, *mid-rib dark reddish*. Scapes 50–200mm, ascending to erect; *exterior bracts 9 × 2·5mm, spreading, pale green* above, darker green below; capitulum 40mm; ligules striped grey-violet; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. $2n = 24$*. Obligate agamosperm. **Fig. 32.**

Grassy places, especially on well-drained, base-rich soils. Locally common on sand-dunes, limestone grassland etc. especially in the north and west. 17, 20, 22, 23, 26, 28, 29, 31, 38, 41, 48, 57, 60, 62, 66, 67, 69, 75, 95, 96, 98, 101, 111, 112, S. (24, S). Native.
Northern Europe. Be, Br, Da, Fe, Ga, Ge, Ho, No, Su.

This species is most readily recognised by the dull, dentate, broad-lobed leaves and the small, spreading exterior bracts. The petiole and mid-rib are of a characteristic dull, ruby-red colour.

122. T. hemipolyodon Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 625 (1929)

Leaves 150–300mm, erect, dull green; leaf-lobes 5–7, *irregularly arranged*, patent or nearly so, *narrow*, but not differentiated into broad base and linear process, *both lobe-margins and interlobes dentate* with a *variety of tooth types and lobules; terminal lobe broad*, ± *obtuse*; petiole dull purple, usually winged. Scapes 150–300mm, erect; *exterior bracts 14 × 4mm, erect - spreading, pale glaucous green inside*, dark green outside; capitulum 50mm; ligules striped violet-grey; styles exserted, discoloured, pollen present. Achenes 3·2mm, straw-brown. **Fig. 32.**

Waste places; rare, in southern England, the south Midlands and Yorkshire. 7, 17, 20, 22, 23, 35, 62. (7). Endemic.

T. hemipolyodon is a characteristic species with large, strongly dentate leaves and large, erect exterior bracts. It has apparently no close relatives and its scarcity suggests that it is a relict species rather than one of recent origin.

123. T. obscuratum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1929*, **9**: 27 (1930), *non* Hagl., *Bot. Not.*, **1934**: 26

Leaves 100–250mm, spreading to erect, *dull, dark green*; leaf-lobes 3–6, patent, short, *broad*, triangular, *rather regularly dentate on the distal margins and the interlobes*; terminal lobe acute or *subobtuse, dentate and often subdivided*; petiole dull purple, unwinged or narrowly winged, mid-rib dark green. Scapes 150–300mm, erect, narrow; *exterior bracts 10 × 2–3mm, erect to spreading, pale green inside*, very dark green outside; capitulum 45mm; *ligules striped purple*; styles exserted, discoloured, pollen present. *Achenes 3·5mm, straw-brown, rugose throughout.* **Fig. 25.**

Wood margins and woodland glades; rarely in other habitats. Very local, in England and Scotland. 15, 20, 23, 29, 62, 66, 67, 90, 99, 101. (10). Endemic.

Experiments at Rothamstead suggest that it is confined to areas with a pH of about 5, with very low levels of calcium, magnesium and sodium.
This is an unmistakable species with regularly dentate lateral and terminal leaf-lobes, and rather small, erect, very dark, exterior bracts. The large, rugose achenes are particularly diagnostic, and the combination of coloured petiole and green mid-rib is unusual. Like 122. *T. hemipolyodon*, it has no close relatives and this may be another relict endemic species.

124. T. parvuliceps H. Lindb. f., *Meddn Soc. Fauna Flora fenn.*, **36**: 5 (1910)

T. officinale var. *lacerum* Brenner, *Meddn Soc. Fauna Flora fenn.*, **32**: 98 (1906), *non T. lacerum* Greene, *Pittonia*, **4**: 230 (1901)
T. officinale **laceratum* Brenner, *Meddn Soc. Fauna Flora fenn.*, **33**: 90 (1907)
T. laceratum (Brenner) Brenner, *Meddn Soc. Fauna Flora fenn.*, **35**: 179 (1909), *nomen nudum*

Leaves 50–200mm, spreading to erect, dull green; leaf-lobes 3–4, irregularly arranged, patent or slightly recurved, variable in width, *distal margin and interlobes strongly dentate*; terminal lobe variable, usually somewhat dentate; *petiole dull reddish*, unwinged or narrowly winged. Scapes 100–250mm, erect, narrow; *exterior bracts 10 × 1·5–2mm, strongly recurved*, pale green above; *capitulum 30mm*; ligules striped grey-violet; styles exserted, discoloured, *pollen absent*. Achenes 2·8mm, straw-brown. **Fig. 18.**

Waste places; throughout Britain but very local. 3, 22, 29, 41, 48, 79, 99. (7). Probably introduced.
Northern Europe; probably widely introduced. (Be), (Br), Da, Fe, (Ga), Ge, No, Rs(B), Su.

T. parvuliceps is readily recognised as it is the only species apart from 73. *T. inane* to have discoloured styles and no pollen; in addition the delicate habit, red petioles, highly dentate leaves and small capitula are all characteristic. It has only been recorded on a few occasions in Britain, and it seems to be both scattered and sporadic in its appearance. It is likely to be native only in Fennoscandia and the Baltic area for only there can it be said to be fairly frequent and persistent.
Although most Scandinavian workers now regard Brenner's taxon as synonymous with *T. parvuliceps*, Lindberg himself (Brenner 1909, p.179) redetermined all Brenner's original material, most of it as *T. pallidulum* H. Lindb. f. Since I have not seen this material I am here adopting the generally accepted view.

125. T. polyodon Dahlst., *Ark. Bot.*, **9**(10): 56 (1910)

T. ardisodon Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 623(1929)

Leaves 50–200mm, spreading, dark green, usually with black or dark purple blotches on the interlobes; *leaf-lobes 5–6, patent or slightly recurved, rather short, triangular, distal margin and interlobes strongly dentate*, less frequently so on the proximal margin and the terminal lobe; terminal lobe small, triangular, subdivided on outer (early) leaves, often much larger on inner (later) leaves; petiole dark purple, narrowly winged. Scapes 50–200mm, erect, equalling leaves; exterior bracts 10 × 2mm, spreading to *recurved*, pale green above, darker below, sometimes suffused with purple; capitulum 50mm; ligules striped purple; styles exserted, discoloured, pollen present. Achenes 3·2mm, olive-brown. $2n = 21, 22, 23, 24^*, 48$ (*gigas*). Obligate agamosperm, or, exceptionally, facultative agamosperm. **Fig. 33.**

Grassy places, roadsides etc. Locally common throughout Britain; not yet recorded from Ireland but doubtless considerably under-recorded. 3, 15–17, 19, 20, 22–24, 28, 29, 32, 34, 39, 41, 60, 66, 67, 75, 77, 82, 84, 90, 95, 99, 101, 112. (27). Native.
Northern Europe. Be, Br, Da, Fe, Ga, Ge, Ho, No, Rs(B), Su.

T. polyodon is best distinguished from the other highly dentate species with coloured petioles by the dark interlobes and recurved exterior bracts. 119.

T. maculatum is similar but flowers earlier, has more recurved, convex-margined leaf-lobes, shorter scapes and purple exterior bracts. It also has more vivid leaves.

126. T. reflexilobum H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 31 (1907)

T. reflexifolium Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1926*, **8**: 32 (1927), *nomen nudum*

Leaves many, 50–200mm, decumbent to erect, dull, dark green; *leaf-lobes 6–8, strongly recurved, narrow, distal margin strongly dentate*; terminal lobe small, narrow, ± *sagittate*, acute, usually entire; *interlobes narrow, often with dark blotches, strongly dentate*; petiole violet-purple, unwinged. Scapes 80–200mm, erect; exterior bracts 10 × 2mm, spreading to recurved, pale green above, dark green below, often suffused with purple; capitulum 40mm; ligules striped grey-purple; styles exserted, discoloured, pollen present. *Achenes* 2·5*mm*, straw-brown. **Fig. 33.**

Grassy places, roadsides etc. Scattered throughout England and Scotland, but frequent in some localities and perhaps under-recorded. 22, 23, 25, 29, 55, 62, 75, 83, 94, 106. (10). Probably native.
England, Scotland, Finland and Sweden. Br, Fe, Su.

Like 101. *T. mucronatum*, this is another remarkable instance of a local Scandinavian species appearing in Britain. Both Dahlstedt and van Soest have assigned British material to this species, and I too can find no significant differences between British and Scandinavian material. Although it may possibly be adventive in Britain, the relatively natural habitats in which it occurs, and its frequency in some areas argues against this. *T. reflexilobum* has very distinctive narrow, dark leaves with black interlobes, and many narrow, recurved leaf-lobes. It is clearly allied to 125. *T. polyodon*, which has fewer, broader, less recurved leaf-lobes, larger teeth and larger achenes. The achenes of *T. reflexilobum* are among the smallest in the genus.

127. T. crispifolium H. Lindb. f., *Acta Soc. Fauna Flora fenn.*, **29**(9): 27 (1907)

T. polylobum Dahlst. ex Hagl., *Bot. Not.*, **1934**: 382 (1934), *nomen in syn.*

Leaves many, 50–200mm, *decumbent, narrow*, dark green, *interlobes usually unblotched; leaf-lobes 4–8, short, crisped from a broad base, abruptly narrowed to form a* ± *patent, or somewhat recurved, short, narrow to linear process, distal margin convex*; terminal lobe small, subsagittate, entire; petiole dull, reddish-purple, winged. Scapes 50–150mm, recurved, decumbent to erect, usually somewhat purplish; exterior bracts 8 × 2mm, dark green below, paler above, often suffused with purple; *capitulum 35mm*; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·2mm, olive-brown. **Fig. 26.**

Grassy places, especially old, well managed, wet pastures. Widespread but very

scattered; probably under-recorded. 9, 12, 17, 20, 22–24, 39, 44, 62, 67, 95, 106, H16. (13, H1). Native.
Northern Europe and Switzerland; not recorded from France or Germany. Be, Br, Da, Fe, Hb, He, Ho, No, Su.

Experiments at Rothamstead Experimental Station indicate that it prefers well-manured, fertile pastures with a low pH of between 5 and 6.
T. crispifolium is best known by the many dark, narrow leaves and the characteristic shape of the leaf-lobes. These are highly crisped, and of the species bearing linear processes *T. crispifolium* has by far the shortest. It is clearly related to 126. *T. reflexilobum*, which has quite different leaf-lobes and much smaller achenes, and to 128. *T. canoviride*, which has grey leaves and longer linear processes.

128. T. canoviride H. Lindb. f. ex Puolanne, *Memo. Soc. Fauna Flora fenn. for 1931–1932*, **8**: 147 (1933), *Sched. Pl. Finland. Exsicc., Helsingfors*, **21–42**: 118 (1944), *diag. lat.*

T. canoviride H. Lindb. f. ex Florstr., *Acta Soc. Fauna Flora fenn.*, **39**(4): 72 (1914), *nomen nudum*

Leaves many, 50–200mm, *decumbent* to erect, *crisped, grey-green*, unblotched; leaf-lobes 4–6, ± patent, *linear, often widening slightly at the subobtuse apex, widening abruptly at the extreme base*; terminal lobe tripartite, middle process linear, widening at the subobtuse apex; interlobes narrow, with large teeth and lobules of varying size; petiole dull violet, narrowly winged. Scapes 50–180mm, decumbent to erect; exterior bracts 10 × 3mm, spreading to recurved, ± *valvate, forming a neat 'ruff'*, pale above, darker below, usually suffused with purple; *capitulum 35mm*; ligules striped grey-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, warm straw-brown. **Fig. 30.**

In old, well managed, wet pastures; local and rare, apparently confined to the south Midlands. 20, 22, 23, 26. (4). Native.
Northern Europe extending southwards to Switzerland. Be, Br, Da, Fe, Ge, He, Ho, No, Rs(B), Su.

At Rothamstead Experimental Station it is restricted to pastures with a pH of between 5 and 6, low in cations, but well-manured and highly productive.
This is the only Vulgaria species with crisped, grey-green, laciniate leaves, violet petioles and swollen, subobtuse tips to the lobes. The subvalvate involucre, similar to that found in the Scandinavian *T. piceatum* Dahlst., is also diagnostic.

129. T. obliquilobum Dahlst., *Ark. Bot.*, **9**(10): 46 (1910)

T. similatum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928*, **8**: 626 (1929)
T. tenuisquameum Dahlst. ex Hagl., *Acta Horti gotoburg.*, **11**: 39 (1936)
T. unguiculosum H. Lindb. f. & Palmgr. in Palmgr., *Acta Soc. Fauna Flora fenn.*, **34**(1): 4 (1910)

Leaves 80–200mm, *decumbent* to erect, dull, olive-green, *narrowly oblong*, unblotched; leaf-lobes 4–5, recurved, short, filiform-dentate, often with larger teeth or lobules; *terminal lobe subdivided*; interlobes with large teeth and lobules; petiole dull, red-purple, winged. Scapes 80–200mm, ascending to erect; *exterior bracts 10 × 1·5mm, recurved*, pale green above, darker below, sometimes suffused with purple; capitulum 45mm; ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 3·0mm, olive-brown. **Fig. 31.**

Waste places etc.; southern England, scattered and rare. 17, 22, 24. (3). Introduced.
Northern Europe extending southwards to Switzerland; often common. Be, (Br), Da, Fe, Ga, Ge, He, Ho, No, Rs(B), Su.

T. obliquilobum is best known by its olive-green, oblong leaves with rather ill-defined lobes and long, narrow, recurved exterior bracts. 106. *T. dahlstedtii*, with a rather similar leaf-shape and narrow, recurved exterior bracts, has bright purple, unwinged petioles. 124. *T. parvuliceps*, with a similar involucre, has quite different leaves, and lacks pollen. Although common on the continent, there are only three records of *T. obliquilobum* in Britain, all from ruderal habitats, and it seems very likely that it is a casual.

130. T. privum Dahlst., *Ark. Bot.*, **10**(6): 7 (1911)

Leaves 100–250mm, erect, pale to mid-green, sometimes with dark blotches on the internodes; *leaf-lobes 4–5, rather crowded, recurved, triangular, margins ± straight*, entire or somewhat dentate; terminal lobe triangular; *petiole rose-pink, sometimes partially or scarcely coloured*, broadly-winged. Scapes 200–350mm, erect, far exceeding leaves; *exterior bracts 15 × 4–5mm*, spreading, pale green above, darker below; capitulum 50mm; ligules striped grey-purple; *styles pure yellow when fresh, pale straw-coloured when dry, pollen present.* Achenes 3·0mm, straw-coloured, *plump*. **Fig. 18.**

Roadsides and grassy places; very local in England and Wales. 12, 21, 23, 29, 31, 32, 34, 35, 41, 60, 66, 70. (12). Probably native.
England and Wales, Fennoscandia and the Baltic, the Netherlands and Belgium. Be, Br, Da, Fe, Ho, No, Rs(B), Su.

This species is related to nos. 102–105, and should perhaps be placed there. In particular, 104. *T. adsimile* has leaves of a very similar shape, but these are dark green and lack dark interlobes. *T. privum* differs from all these in the very long and broad exterior bracts, the yellow styles, and the plump, straw-coloured achenes, and for these reasons it has been placed here.

131. T. orcadense Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 304 (1926)

T. tanylepioides Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 303 (1926)
T. perlaciniatum Dahlst. in Johnston, *Trans. Proc. bot. Soc. Edinb.*, **29**: 421 (1927)

Leaves 50–200mm, spreading to erect, ± *shining, dark green*; leaf-lobes 2–4, patent or slightly recurved, *broad* and short, triangular at least on the outer (older) leaves, margins usually straight, entire or with a few large teeth; *terminal lobe about twice the length of lateral lobes, broad,* ± *rounded,* usually *apiculate* and *entire*; petiole deep purple, unwinged or winged. Scapes 40–200mm, erect, often shorter than leaves; *exterior bracts 10 × 2·5mm, spreading-erect, dark green outside,* paler inside, often suffused with purple; capitulum 50mm; ligules striped brown-violet; styles exserted, discoloured, pollen present. Achenes 3·5mm, straw-brown. **Fig. 25.**

Grassy places; known only from Mainland and Cava, Orkney, where it seems to be frequent, and from Mainland and Fetlar, Shetland. 111, 112. (2). Endemic.

Although this species keys out with 110. *T. fulgidum,* it is not very similar, having dark green leaves of a different shape. However, while not belonging to the *T. hamatum* group (nos. 108–118), it shares with those species an affinity with the section Spectabilia. Indeed, *T. orcadense* might well be regarded as being related to 44. *T. praestans* and 50. *T. naevosum,* from both of which it may be distinguished by the sub-rounded terminal leaf-lobe, and to 48. *T. drucei,* which has paler, thinner leaves and a paler, more delicate involucre. The type description of *T. orcadense* mentions spotted leaves, but none of the known specimens shows this character. *T. tanylepioides* is the correct name on page priority, but Johnston's type material is poor and inadequate. Although some specimens may be of *T. orcadense,* I have decided to adopt the less confused and more generally used name *T. orcadense.*

132. T. cophocentrum Dahlst., *Rep. botl Soc. Exch. Club Br. Isl. for 1928,* **8**: 624 (1929)

Leaves 150–300mm, erect, dull, dark green; *leaf-lobes 1–3, broad, triangular,* margins ± straight, distal margin dentate; *terminal lobe about ¼ length of leaf, broad, rounded, entire* or dentate below; petiole dull purple, narrowly winged. Scapes 150–300mm, erect, rather narrow; *exterior bracts 9 × 2mm, spreading to recurved,* dark green below, paler above, usually somewhat purplish; capitulum 45mm; ligules striped brown-purple; styles exserted, discoloured, pollen present. Achenes 3·5mm, straw-coloured. **Fig. 25.**

Grassy places, especially wood-margins and scrub. The south Midlands and south-east England; very local. The records from Jersey are uncertain. 16, 20–24, 32, S? (7, S?). Endemic.

This is another of the endemic species which are more or less confined to the south Midlands (*cf* nos. 72, 82, 92, 122 and 123). *T. cophocentrum* is readily recognised by the large, dark leaves with few, broad leaf-lobes and a large rounded terminal lobe. The scapes and involucre are disproportionally small. It is most likely to be confused with 94. *T. ekmanii,* which, however, never has rounded terminal leaf-lobes. Owing to difficulties with Dahlstedt's hand-writing, Druce refers to this species as *T. caphocentrum* and *T. caphnocentrum* in addition to *T. cophocentrum.*

Latin diagnoses of new species

(The illustrations are not necessarily of holotype material)

Taraxacum acutum A. J. Richards, **sp. nov.** (no. **22**, p. 37, fig. 6)

Planta humilis, tenella. Folia erecta vel patentia, ± glabra, obscure viridia, ad 60mm longa; lobi laterales 4–5, angusti, acuti, recurvati, margine inferiore grosse 1-pluridentata; interlobia dentata; lobus terminalis angustus, integer; petiolus viridis vel purpureus, exalatus. Scapi folia aequantes vel paullo superantes, virides, pilosi. Squamae involucri exteriores *c* 6mm longae, 2mm latae, patentes, supra pallide virides subtus obscuriores, haud corniculatae, vel marginatae. Calathium diametro 20–30mm, convexum, saturate luteum, ligulis subtus stria violacea notatis; styli exserti, sordidi, polliniferi. Achenium 3·0mm longum, 0·9mm latum, griseo-stramineum, in tertio parte superiore grosse muricatum, ceterum laeve, in pyramidem cylindricam 0·7mm longam abrupte abiens; rostrum 7mm longum, tenue; pappus albus.
Species sectionis Erythrosperma H. Lindb. f., a *T. simile* Raunk. praesertim squamis involucri exterioribus obscuris patentibus et foliorum lobis lateralibus recurvatis differt.

HOLOTYPUS: British Isles, Hertfordshire, Therfield Heath, GR 52/332.395, 15/5/1969, *A. J. Richards* (**OXF**)

Taraxacum placidum A. J. Richards, **sp. nov.** (no. **24**, p. 37, fig. 6)

Planta mediocris. Folia erecta, pallide viridia, nitida, fere glabra, in horto usque ad 200mm longa, angusta; lobi laterales, 5–8, patentes, breves, deltoidei, ad basin sat lati sed in apicem acutam attenuati, margine superiore denticulata vel integro, denticulis numerosis acuminatis; lobus terminalis brevis, acutus, integer; petiolus integer, anguste alatus, cum nervo mediano vivide purpureus. Scapi folia aequantes, apicem et basin versus purpurei, sub involucro araneoso-pilosi. Squamae involucri exteriores 7mm longae, 3mm latae, patentes, supra pallidae et ± glaucae, subtus atrovirentes, albo-marginatae, callum parvum ferentes. Involucrum breve, angustum. Calathium magnum, ad 50mm diametro, planum, flavum, ligulis subtus stria argenteo-grisea notatis; styli exserti, flavi, polliniferi. Achenium 3·5mm longum, 0·8mm latum, griseo-brunneum, superne breviter tuberculatum, ceterum laeve, in pyramidem cylindricam 0·8mm longam abrupte abiens; rostrum 8mm longum, tenue; pappus albus. $2n = 24$. Agamosperma.
Species sectionis Erythrosperma H. Lindb. f.

HOLOTYPUS: Spain, Galicia, Vigo, Baleo, 4/1966, *D. W. Shimwell* (**OXF**)

Taraxacum pseudolarssonii A. J. Richards, **sp. nov.** (no. **45**, p. 51, fig. 12)

Planta mediocris. Folia 100–200mm erecta, obscure viridia, nitida, valde atro-,

purpureo- vel rubro-maculata; lobi laterales 3–5, patentes, angusti, acuti, integri; petiolus clariter purpureus, exalatus. Scapi 100–200mm, erecti, pallidi. Squamae involucri exteriores 7mm longae, 2mm latae, patentes, virides, vix marginatae. Calathium ad 45mm diametro, obscure flavum, ligulis subtus stria violaceo-grisea notatis; styli exserti, sordidi, polliniferi. Achenium 3·5mm longum, 0·9mm latum, brunneo-stramineum, ad apicem spinulosum, ceterum laeve, in pyramidem conicam brevem (0·5mm longam) subabrupte abiens; rostrum sat tenue, 11mm longum; pappus albus. $2n = 32$. Agamosperma.
Species sectionis Spectabilia Dahlst.

HOLOTYPUS: British Isles, Co. Durham, Langdon Beck Hotel, Upper Teesdale, steeply shelving banks of the Langdon Beck and Sand Syke, GR 35/852.310, 10/6/1965, *A. J. Richards* (**OXF**)

Taraxacum caledonicum A. J. Richards, **sp. nov.** (no. **59**, p. 57, fig. 15)

Planta mediocris, fere glabra, colore atrata, saepe pruinosa. Folia 40–100mm, erecta vel decumbentia, atro-viridia, immaculata; lobi laterales 4–6, subhamati, recurvati, supra valde convexa, interdum ad marginem superiorem sigmoidea, fere edentata; lobus terminalis minimus, obtusus sed mucronatus; petiolus brevis, subexalatus, alis integris, cum nervo mediano purpurascens. Scapi foliis duplo breviores vel folia superantes, pallidi. Squamae involucri exteriores 11mm longae, 3mm latae, erectae, laeves, atratae, glaucescentes, vix marginatae, apice rubescentes. Calathium saturate luteum, convexum vel nunquam vere expansum, ligulis brevibus subtus stria purpurea notatis; styli inclusi, sordidi, epolliniferi. Achenium 4mm longum, 1mm latum, griseo-brunneum, superne sparse spinulosum, ceterum laeve, in pyramidem conicam brevem (0·2mm longum) sensim abiens; rostrum 7–9mm longum sat crassum; pappus albus. $2n = 40$. Agamosperma.
Species sectionis Spectabilia Dahlst.

HOLOTYPUS: British Isles, Angus, Clova, Glen Doll, mica-schist cliffs by the Burn of Fialzioch, GR 37/236.773, 2/6/1966, *A. J. Richards* (**OXF**)

Taraxacum pseudonordstedtii A. J. Richards, **sp. nov.** (no. **60**, p. 58, fig. 16)

Planta mediocris, fere glabra. Folia 50–130mm decumbentia, viridia vel atro-viridia, interdum purpureo-suffusa, semper immaculata; lobi laterales 4–6, brevissimi, regulares, recurvati, saepissime integri; interlobia angustissima, saepe e costa sola constantia; petiolus angustus, cum nervo mediano purpureus exalatus. Scapi folia conspicue superantes, purpurascentes. Squamae involucri exteriores 9mm longae, 3mm latae, erectae, laeves, atrovirides, immarginatae. Calathium convexum, saturate luteum, ultra 35mm diametro raro attingens, ligulis brevibus subtus stria purpurea notatis; styli exserti, sordidi, polliniferi. Achenium 3mm longum, 0·9mm latum, griseo-brunneum, superne breviter tuberculatum, ceterum laeve, in pyramidem conicam brevem (0·3mm longum) sensim abiens; rostrum 7mm longum sat crassum; pappus albus. $2n = 32$. Agamosperma.
Species sectionis Spectabilia Dahlst.

HOLOTYPUS: British Isles, Co. Durham, Upper Teesdale, Langdon Beck Hotel, base-rich flushes by the Sand Syke from GR 35/830.308 to 850.310, 16/6/1966, *A. J. Richards* (**OXF**)

Taraxacum cambriense A. J. Richards, **sp. nov.** (no. **65**, p. 61, fig. 16)

Planta mediocris, tenella, fere glabra, pallide viridis. Folia 80–170mm, erecta, pallide viridia, immaculata; lobi laterales 4–5, ± patentes, angusti, acuti, integri vel paullo denticulati; petiolus angustus, purpureus, exalatus; nervus medianus viridis. Scapi folia superantes, viridia. Squamae involucri exteriores 7mm longae, 2·5mm latae, adpressae-erectae, laeves, atrovirides, glaucae, conspicue albo-marginatae. Calathium *c* 40mm diametro, planum, flavum, ligulis brevibus subtus stria griseo-violacea notatis; styli exserti, sordidi, epolliniferi. Achenium 3·8mm longum, 1mm latum, stramineum, ad apicem leviter tuberculatum, ceterum laeve, in pyramidem conicam brevem (0·4mm longam) subabrupte abiens; rostrum 7mm longum, sat tenue; pappus albus.
Species sectionis Spectabilia Dahlst.

HOLOTYPUS: British Isles, Pembrokeshire, the Nab Head, St Brides, GR 14/790.111, 4/5/1969, *T. A. W. Davis* no. 69/1188 (**OXF**)

Taraxacum inane A. J. Richards, **sp. nov.** (no. **73**, p. 66, fig. 24)

Planta subgrandis. Folia 150–250mm, erecta, obscure viridia; lobi laterales 4–6, recurvati, ad basin sat lati sed in apicem acutam attenuati, margine superiore denticulata, denticulis ad 7, acuminatis angustissimis; lobus terminalis longus, ad tertiam partem foliae, integer, hastate-sagittatus; petiolus sublongus, viridis vel roseus, exalatus. Scapi folia aequantes. Squamae involucri exteriores 10mm longae, 3mm latae, recurvati, supra pallidae vel purpurascentes, subtus atro-virentes, emarginatae. Calathium ad 45mm diametro, flavum, ligulis subtus stria purpureo-grisea notatis; styli exserti vel inclusi, sordidi, epolliniferi. Achenium ignotum.
Species sectionis Vulgaria Dahlst.

HOLOTYPUS: British Isles, Kintyre, Inverneill shore, GR 16/85.82, 10/5/1970, *A. G. Kenneth* no. 5070 (**OXF**)

Taraxacum tamesense A. J. Richards, **sp. nov.** (no. **109**, p. 82, fig. 27)

Planta subhumilis, subtenella. Folia 40–150mm, erecta, obscure viridia, interdum purpurascentes vel purpureo notata, in interlobis vel alibi; lobi laterales 2–3, brevissimi, lati, recurvati, acuti vel ± obtusi, integri vel inferiore dentati; lobus terminalis angustus, acutus vel subobtusus; petiolus foliis 2–3-plo brevior, vivide purpureus exalatus. Scapi folia valde superantes, erecti, angusti, purpurei. Squamae involucri exteriores 8mm longae, 2mm latae, patentes-erectae, atrovirides, purpureo suffusae, emarginatae. Calathium saturate luteum, *c* 35mm

diametro, ligulis subtus stria purpurea notatis; styli sordidi, polliniferi. Achenium 3·0mm longum, stramineo-brunneum, ad apicem tuberculatum, in pyramidem conicam subbrevem (0·6mm) subabrupte abiens; rostrum 7mm longum, sat tenue; pappus albus.
Species sectionis Vulgaria Dahlst.

HOLOTYPUS: British Isles, Oxfordshire, Oxford, Pixey Mead, GR 42/484.095, 7/5/1970, *A. J. Richards* (**OXF**)

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Sources of Material

The following herbaria were consulted during the preparation of this work: Aberystwyth **ABS**, Bangor **UCNW**, Birmingham **BIRM**, British Museum **BM**, Cambridge **CGE**, Cardiff **NMW**, Copenhagen **C**, Dublin **TCD**, Durham University Herbarium, Edinburgh **E**, Kew **K**, Leiden **L**, Lancaster University Herbarium, Liverpool **LIV**, **LIVU**, Oxford **OXF**, Stockholm **S** and Swansea University College Herbarium, as well as the private herbaria of C.-F. Lundevall, J. L. van Soest, H. Øllgaard, S. Nordenstam, F. le Sueur and U. K. Duncan.

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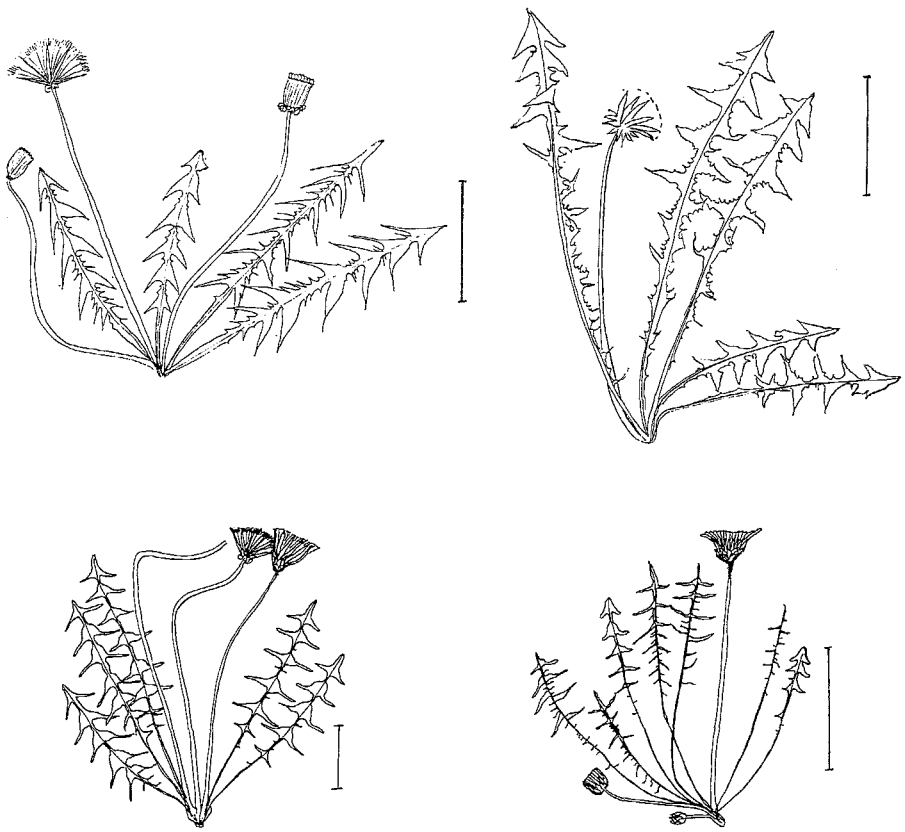

FIGURE 1.

1. *T. brachyglossum* (Dahlst.) Dahlst. (p. 27) 2. *T. argutum* Dahlst. (p. 28)
3. *T. lacistophyllum* (Dahlst.) Raunk. (p. 29) 4. *T. rubicundum* (Dahlst.) Dahlst. (p. 29)

FIGURE 2.

5. *T. austriacum* v. Soest (p. 30) 6. *T. silesiacum* Hagl. (p. 30)
7. *T. commixtum* Hagl. (p. 31) 8. *T. disseminatum* Hagl. (p. 31)

FIGURE 3.

9. *T. glaucinum* Dahlst. (p. 31)
10. *T. hispanicum* H. Lindb. f. (p. 32)
11. *T. gotlandicum* (Dahlst.) Dahlst. (p. 32)
12. *T. laetum* (Dahlst.) Dahlst. (p. 32)

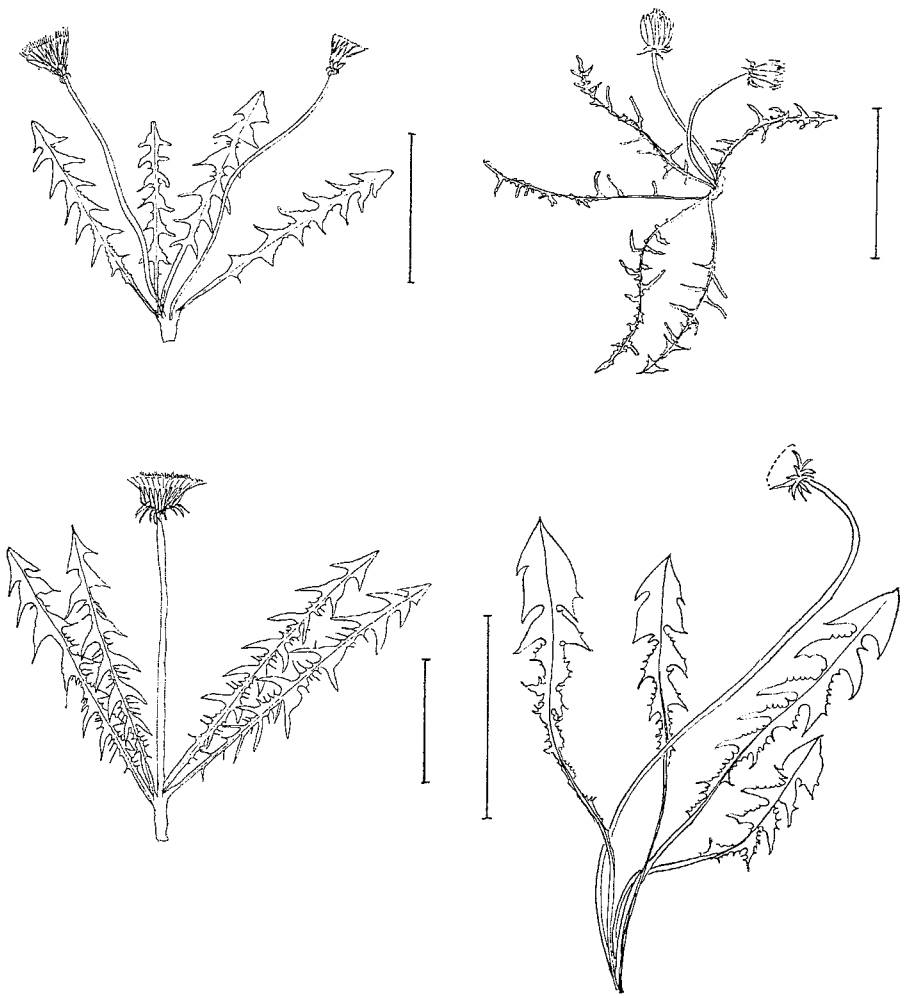

FIGURE 4.
13. *T. laetiforme* Dahlst. (p. 33) 14. *T. dunense* v. Soest (p. 33)
15. *T. fulvum* Raunk. (p. 34) 16. *T. fulviforme* Dahlst. (p. 34)

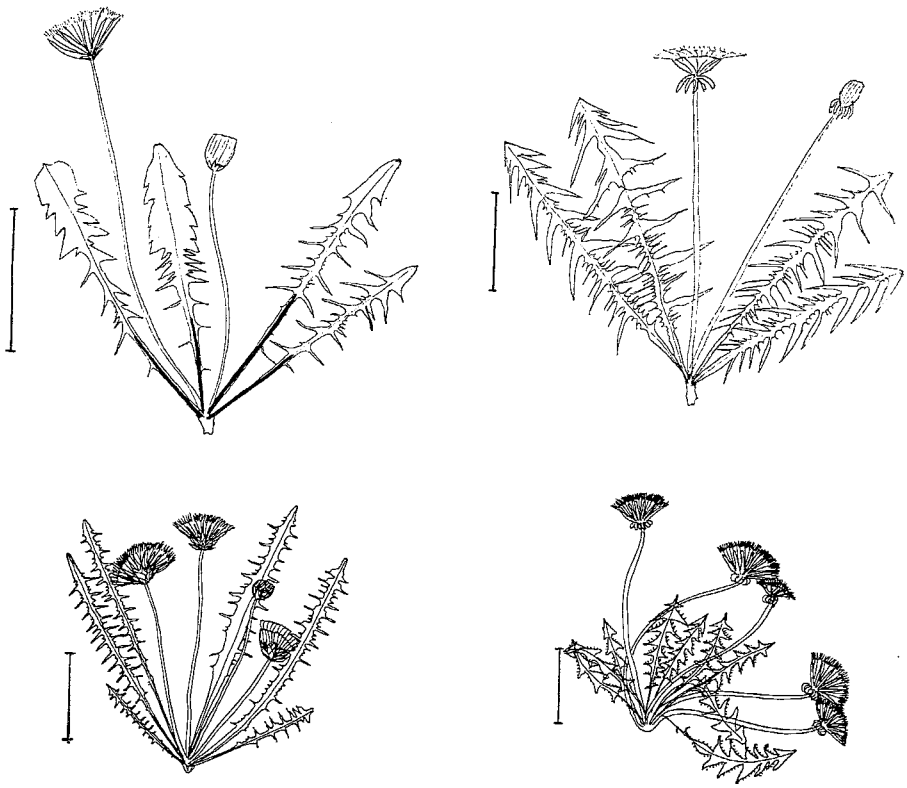

FIGURE 5.

17. *T. oxoniense* Dahlst. (p. 35)
18. *T. retzii* v. Soest (p. 35)
19. *T. glauciniforme* Dahlst. (p. 36)
20. *T. proximum* (Dahlst.) Dahlst. (p. 36)

FIGURE 6.

21. *T. simile* Raunk. (p. 36)
22. *T. acutum* A. J. Richards (pp. 37, 96)
23. *T. degelii* Hagl. (p. 37)
24. *T. placidum* A. J. Richards (pp. 37, 96)

FIGURE 7.

25. *T. pseudolacistophyllum* v. Soest (p. 38)
26. *T. canulum* Hagl. (p. 38)
27. *T. proximiforme* v. Soest (p. 39)
28. *T. obliquum* (Fries) Dahlst. (p. 40)

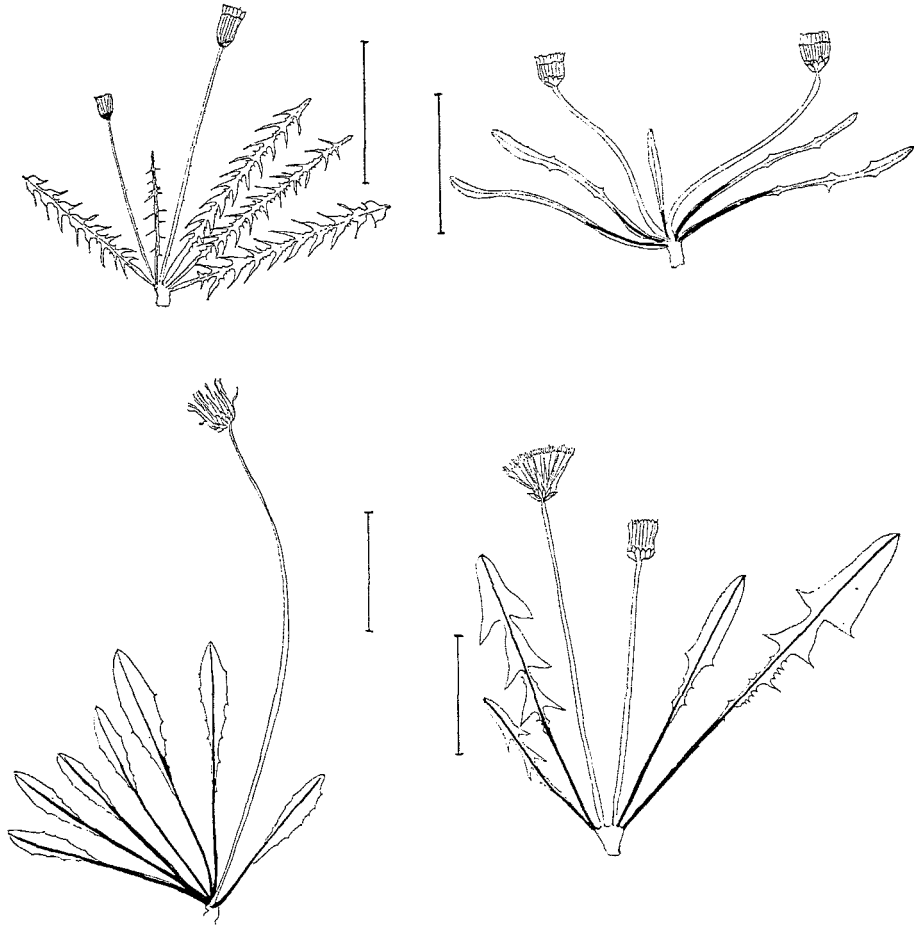

FIGURE 8.

29. *T. platyglossum* Raunk. (p. 41)
30. *T. palustre* (Lyons) Symons (p. 42)
31. *T. austrinum* Hagl. (p. 43)
32. *T. anglicum* Dahlst. (p. 44)

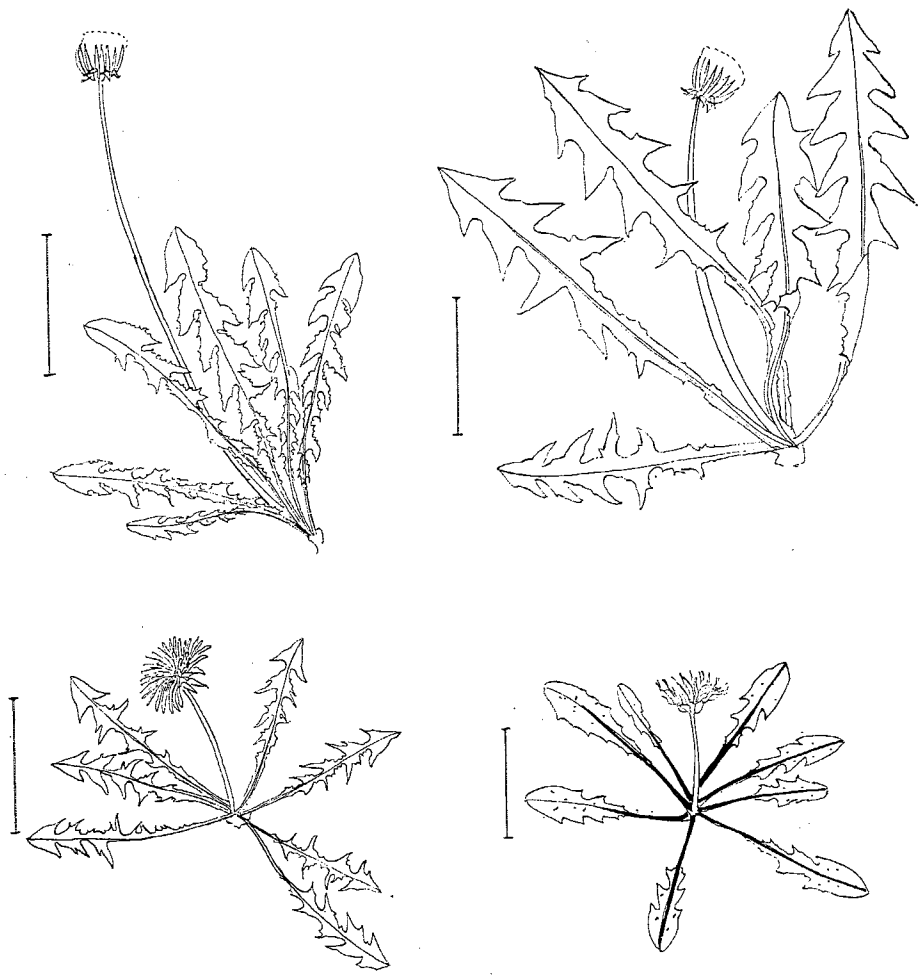

FIGURE 9.

33. *T. inguilobum* Dahlst. (p. 46) 34. *T. fulvicarpum* Dahlst. (p. 46)
35. *T. landmarkii* Dahlst. (p. 47) 36. *T. faeroense* (Dahlst.) Dahlst. (p. 47)

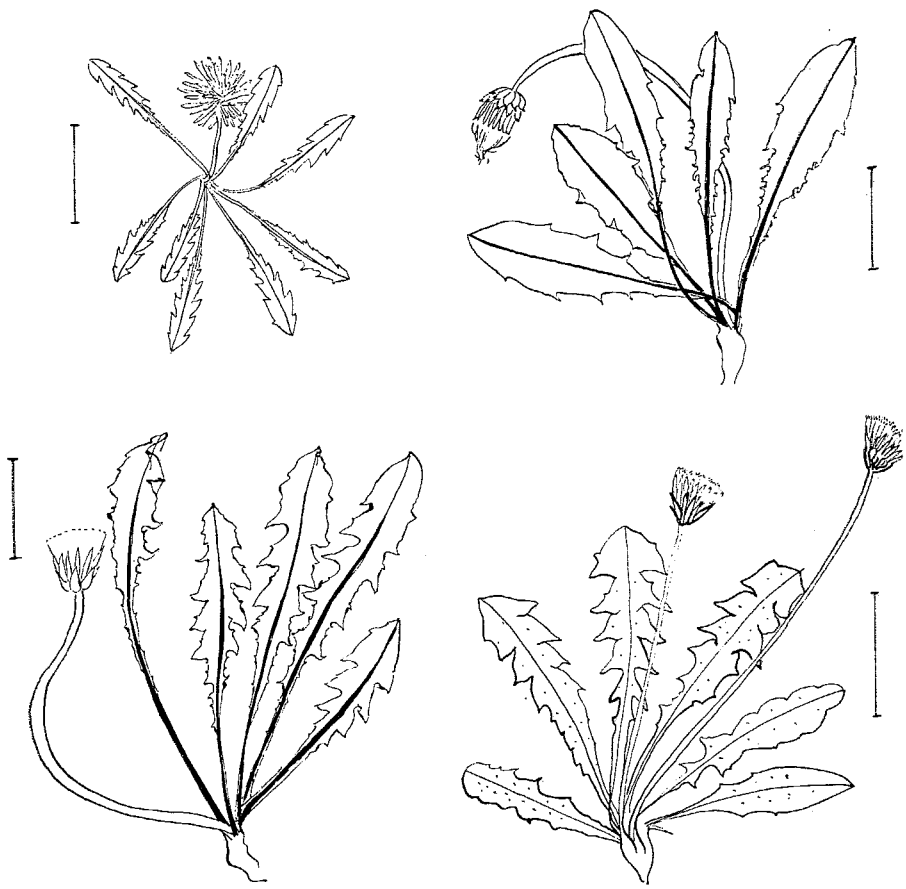

FIGURE 10.

37. *T. spectabile* Dahlst. (p. 48) (upland form)
37. *T. spectabile* Dahlst. (p. 48) (lowland form)
38. *T. eximium* Dahlst. (p. 48)
39. *T. reclinatum* M.P. Chr. (p. 49)

FIGURE 11.

40. *T. acrifolium* Dahlst. (p. 49)
41. *T. calophyllum* Dahlst. (p. 49)
42. *T. euryphyllum* (Dahlst.) M.P. Chr. (p. 50)
43. *T. maculigerum* H. Lindb. f. (p. 50)

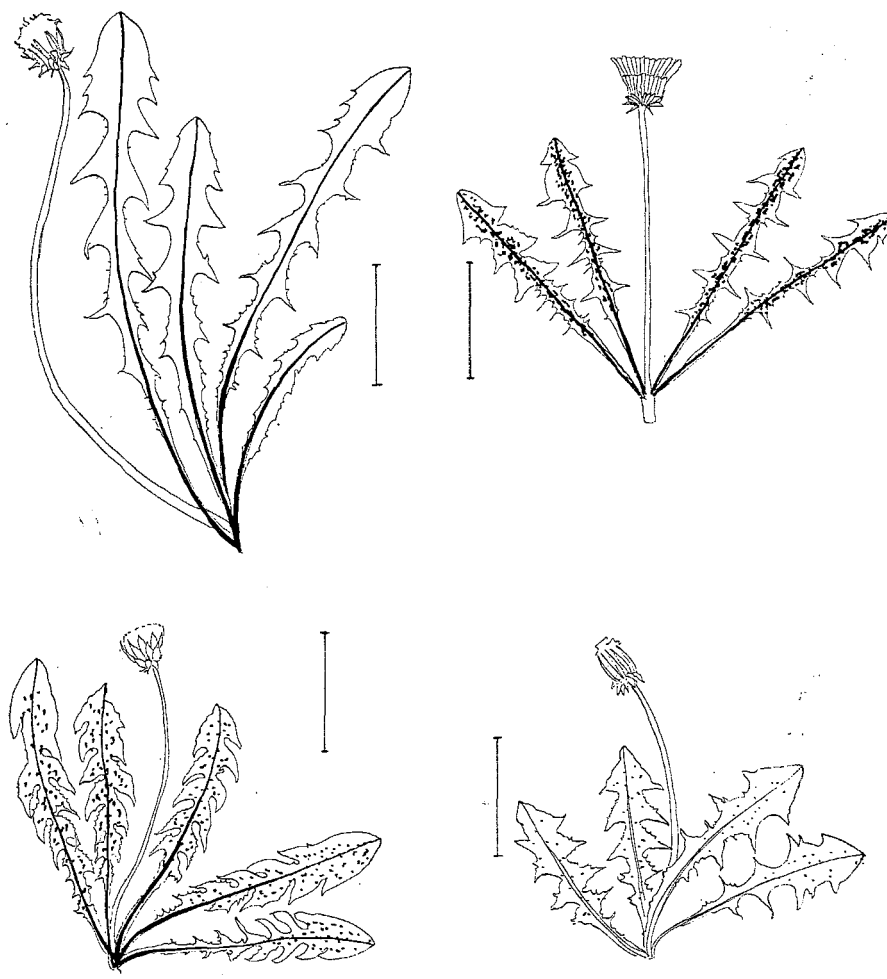

FIGURE 12.

44. *T. praestans* H. Lindb. f. (p. 51)
45. *T. pseudolarssonii* A. J. Richards (pp. 51, 96)
46. *T. naevosiforme* Dahlst. (p. 52)
47. *T. subsimile* Dahlst. (p. 52)

FIGURE 13.

48. *T. drucei* Dahlst. (p. 52)
49. *T. lainzii* van Soest (p. 53)
50. *T. naevosum* Dahlst. (p. 53)
51. *T. laetifrons* Dahlst. (p. 54)

FIGURE 14.

52. *T. croceum* Dahlst. (p. 54)
53. *T. ceratolobum* Dahlst. (p. 55)
54. *T. cymbifolium* H. Lindb. f. (p. 55)
55. *T. craspedotum* Dahlst. (p. 56)

FIGURE 15.

56. *T. pycnostictum* M.P. Chr. (p. 56)
57. *T. hypochaeris* Dahlst. (p. 57)
58. *T. stictophyllum* Dahlst. (p. 57)
59. *T. caledonicum* A. J. Richards (pp. 57, 97)

FIGURE 16.

60. *T. pseudonordstedtii* A. J. Richards (pp. 58, 97) 61. *T. nordstedtii* Dahlst. (p. 58)
64. *T. adamii* Claire (p. 60) 65. *T. cambriense* A. J. Richards (pp. 61, 98)

FIGURE 17.
62. *T. hygrophilum* van Soest (p. 59) 64a. *T. hibernicum* Hagl. (p. 60)
63. *T. litorale* Raunk. (p. 59)

FIGURE 18.

107. *T. duplidens* H. Lindb. f. (p. 81)
100. *T. xanthostigma* H. Lindb. f. (p. 77)
124. *T. parvuliceps* H. Lindb. f. (p. 90)
130. *T. privum* Dahlst. (p. 94)

FIGURE 19.

68. *T. cyanolepis* Dahlst. (p. 64) 67. *T. subcyanolepis* M.P. Chr. (p. 63)
84. *T. insigne* Raunk. (p. 71) 81. *T. croceiflorum* Dahlst. (p. 69)

FIGURE 20.

70. *T. ancistrolobum* Dahlst. (p. 65)
78. *T. alatum* H. Lindb. f. (p. 68)
83. *T. expallidiforme* Dahlst. (p. 70)
89. *T. valdedentatum* Dahlst. (p. 73)

FIGURE 21.

71. *T. sublaciniosum* Dahlst. & H. Lindb. f. (p. 65)
87. *T. tenebricans* (Dahlst.) Dahlst. (p. 72)
91. *T. laciniosum* Dahlst. (p. 74)
69. *T. sellandii* Dahlst. (p. 64)

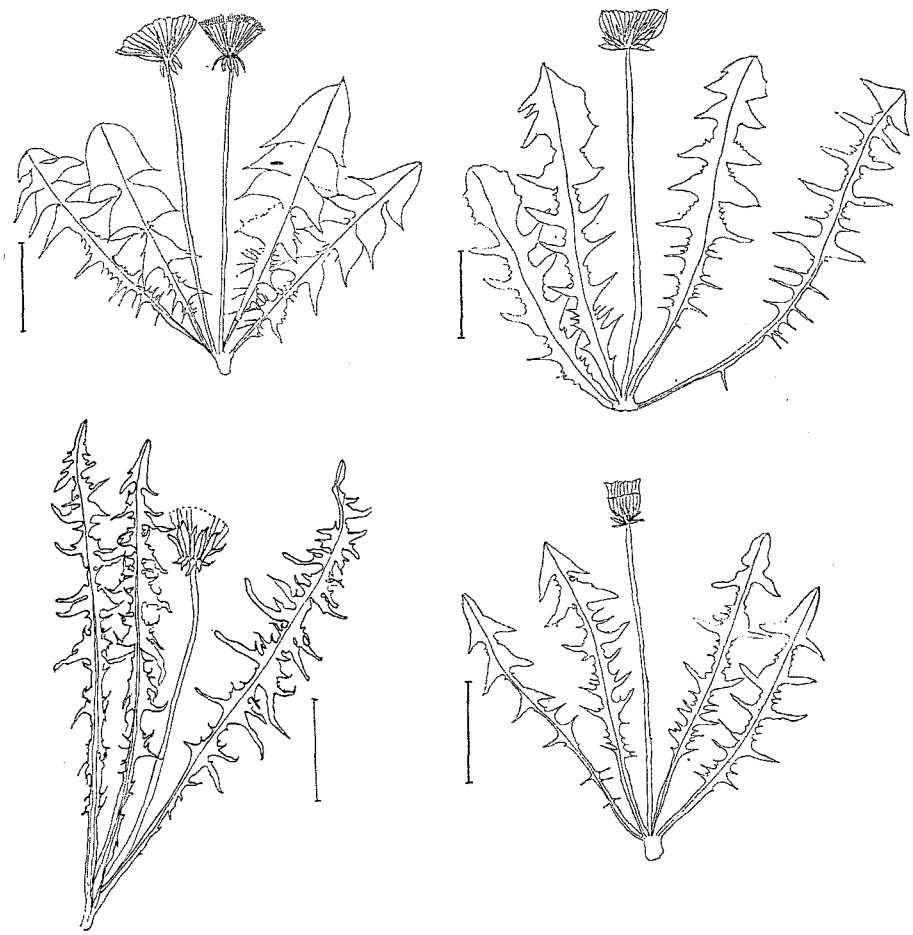

FIGURE 22.

90. *T. spilophyllum* Dahlst. (p. 73)
82. *T. lacerabile* Dahlst. (p. 70)
85. *T. subundulatum* Dahlst. (p. 71)
86. *T. sublaeticolor* Dahlst. (p. 71)

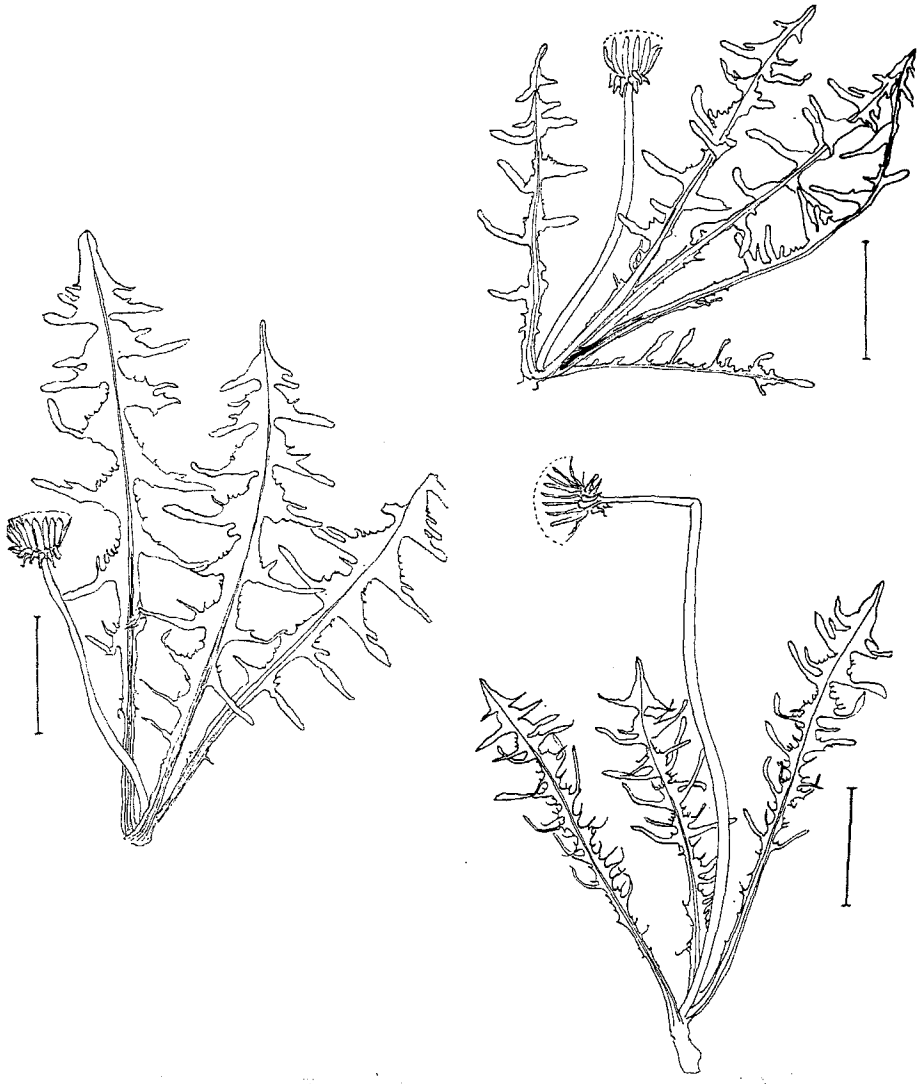

FIGURE 23.

72. *T. stenacrum* Dahlst. (p. 65)
92. *T. cherwellense* A. J. Richards (p. 74)
98. *T. pectinatiforme* H. Lindb. f. (p. 77)

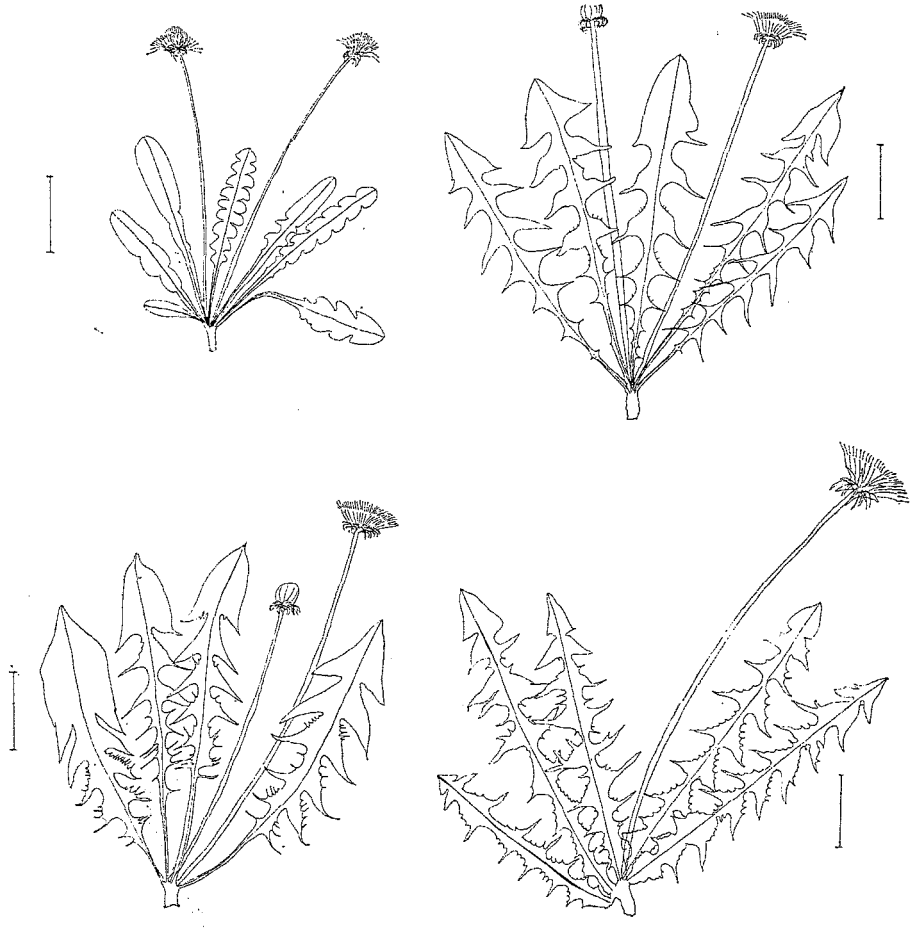

FIGURE 24.

66. *T. obtusilobum* Hagl. (p. 63)
73. *T. inane* A. J. Richards (pp. 66, 98)
74. *T. procerum* Hagl. (p. 66)
80. *T. aequisectum* M.P. Chr. (p. 69)

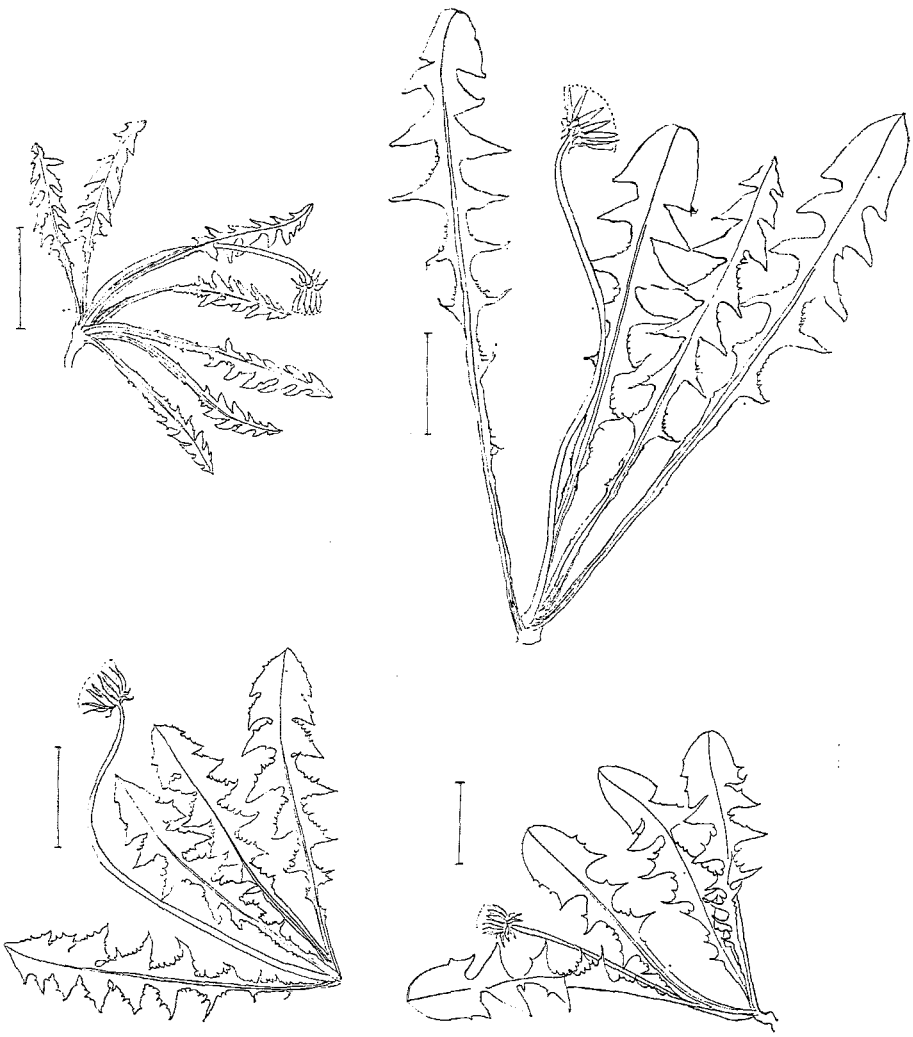

FIGURE 25.

77. *T. pallescens* Dahlst. (p. 68) 132. *T. cophocentrum* Dahlst. (p. 95)
123. *T. obscuratum* Dahlst. (p. 90) 131. *T. orcadense* Dahlst. (p. 94)

FIGURE 26.

127. *T. crispifolium* H. Lindb. f. (p. 92)
116. *T. marklundii* Palmgr. (p. 86)
95. *T. porrectidens* Dahlst. (p. 75)
118. *T. oblongatum* Dahlst. (p. 87)

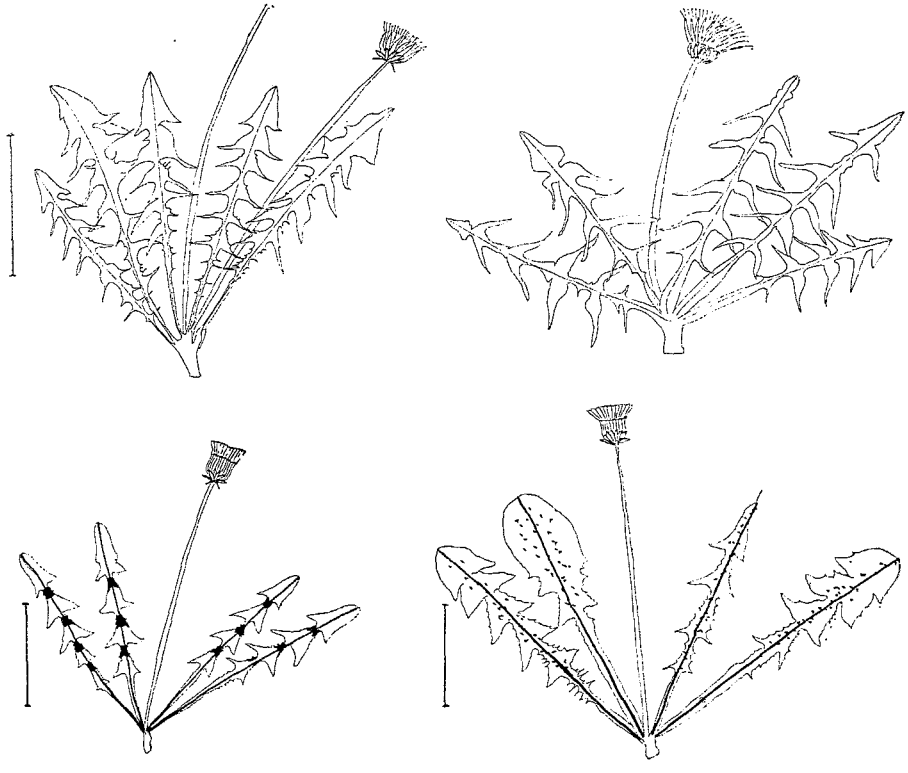

FIGURE 27.

88. *T. tanylepis* Dahlst. (p. 72)
96. *T. biforme* Dahlst. (p. 76)
109. *T. tamesense* A. J. Richards (pp. 82, 98)
110. *T. fulgidum* Hagl. (p. 82)

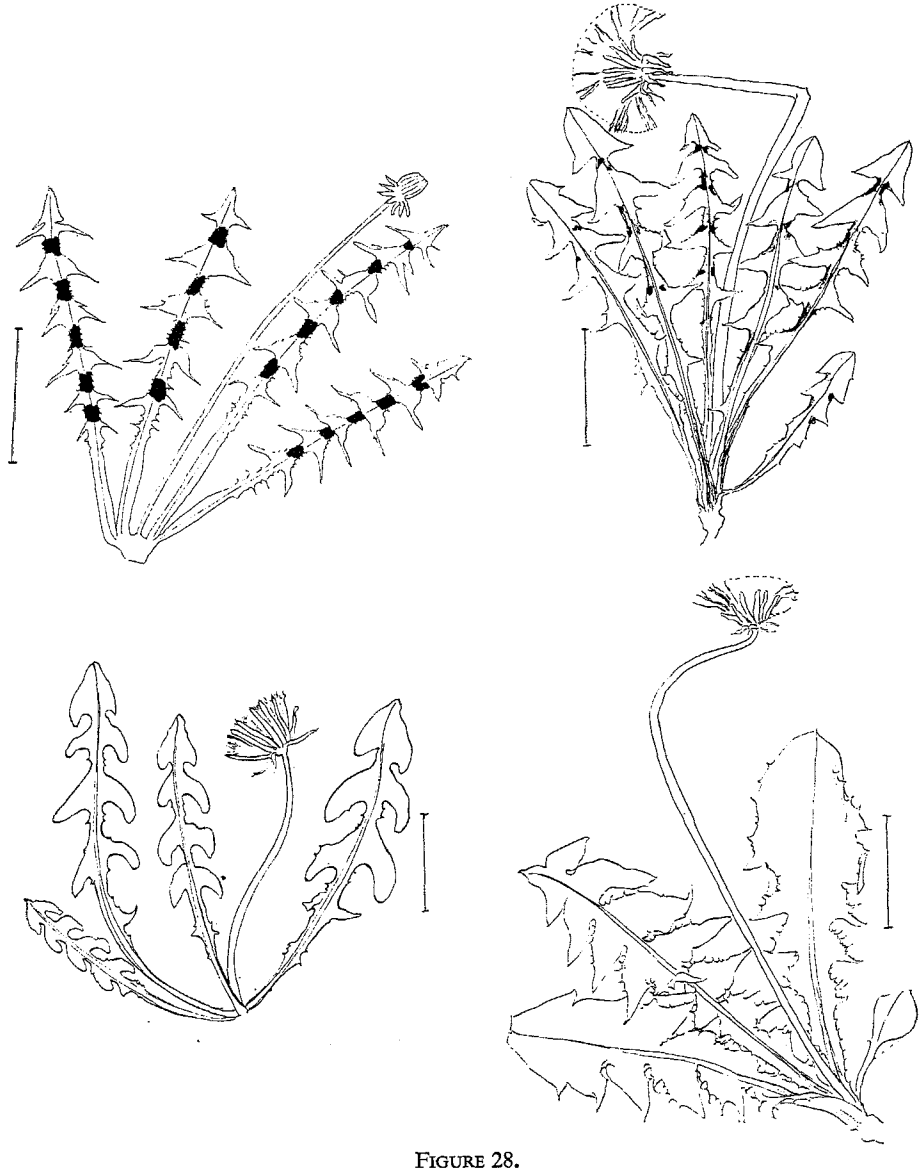

FIGURE 28.

108. *T. melanthoides* Dahlst. (p. 82)
114. *T. hamatum* Raunk. (p. 85)
119. *T. maculatum* Jordan (p. 88)
99. *T. aurosulum* H. Lindb. f. (p. 77)

FIGURE 29.

117. *T. latisectum* H. Lindb. f. (p. 87)
105. *T. longisquameum* H. Lindb. f. (p. 80)
115. *T. hamatiforme* Dahlst. (p. 85)
113. *T. bracteatum* Dahlst. (p. 84)

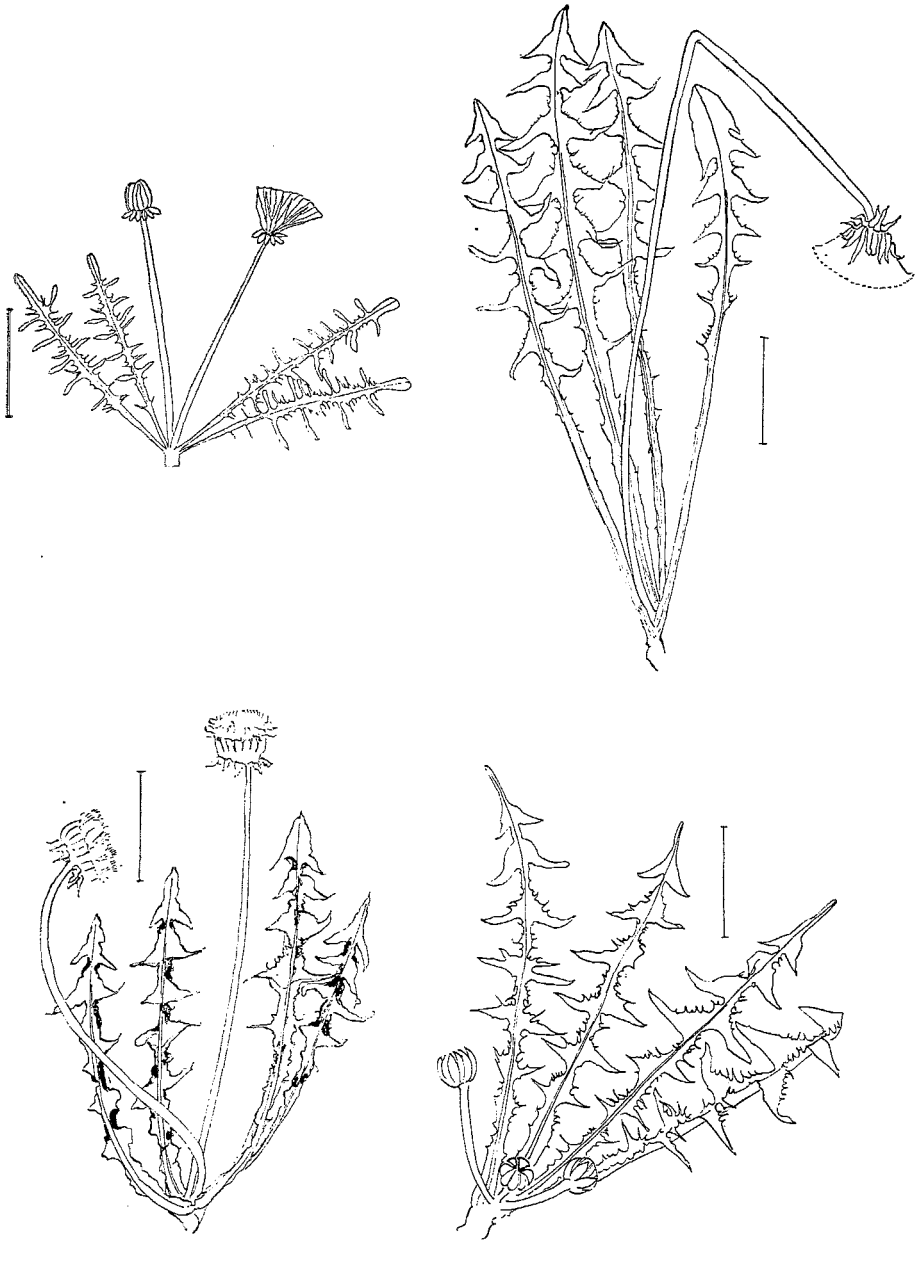

FIGURE 30.

128. *T. canoviride* Puolanne (p. 93)
120. *T. fasciatum* Dahlst. (p. 88)
93. *T. aequilobum* Dahlst. (p. 75)
75. *T. pannucium* Dahlst. (p. 67)

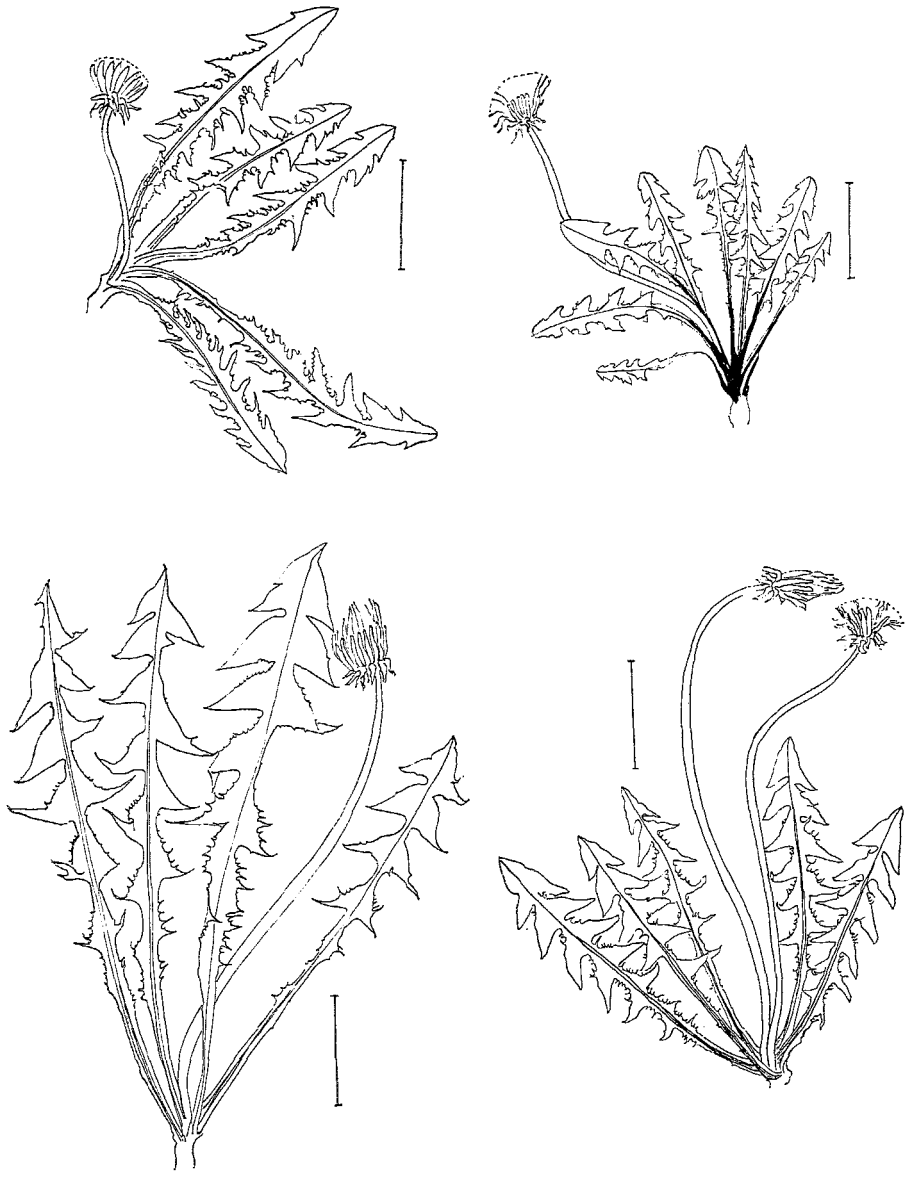

FIGURE 31.

129. *T. obliquilobum* Dahlst. (p. 93)
101. *T. mucronatum* H. Lindb. f. (p. 78)
106. *T. dahlstedtii* H. Lindb. f. (p. 81)
104. *T. adsimile* Dahlst. (p. 80)

FIGURE 32.

94. *T. ekmanii* Dahlst. (p. 75) 79. *T. lingulatum* Markl. (p. 68)
122. *T. hemipolyodon* Dahlst. (p. 90) 121. *T. duplidentifrons* Dahlst. (p. 89)

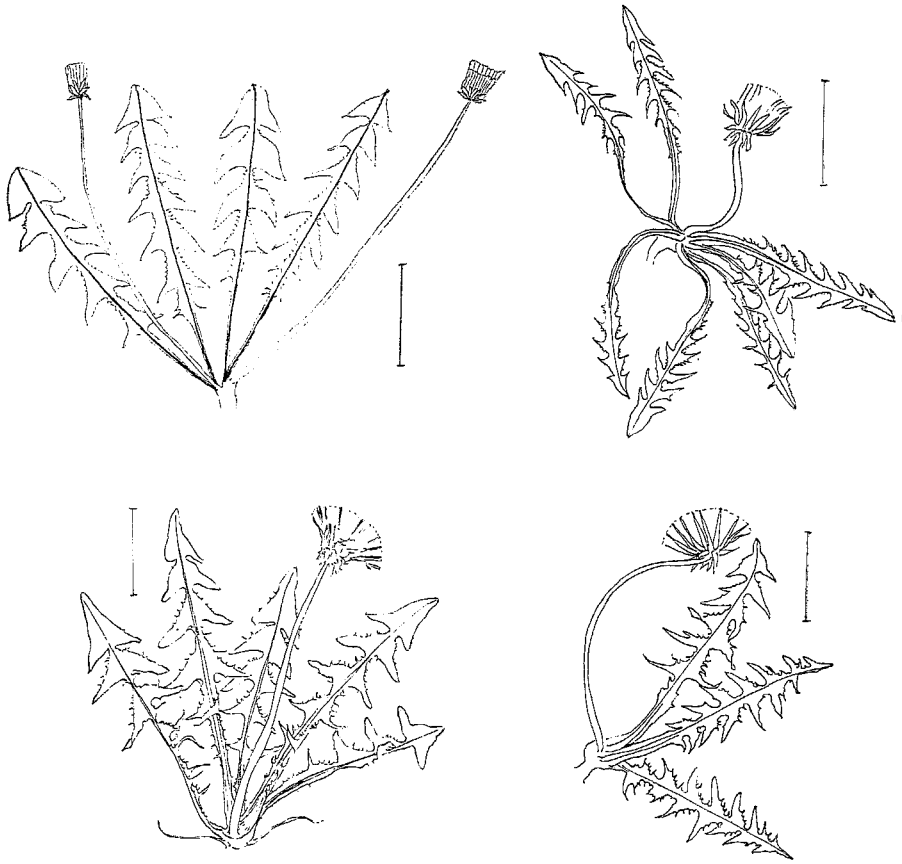

FIGURE 33.

112. *T. christiansenii* Hagl. (p. 84)
103. *T. cordatum* Palmgr. (p. 79)
126. *T. reflexilobum* H. Lindb. f. (p. 92)
125. *T. polyodon* Dahlst. (p. 91)

FIGURE 34.

102. *T. dilatatum* H. Lindb. f. (p. 78)
97. *T. copidophyllum* Dahlst. (p. 76)
111. *T. haematicum* Hagl. (p. 83)
76. *T. linguatum* M.P. Chr. & Wiinst. (p. 67)

Index

Names which are accepted of taxa occuring in the British Isles are in bold type; synonyms are in italics.