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Saxifraga hirculus (Marsh Saxifrage) plant from flushes in the Ox Mountains, Sligo (**H28**). Photo P. Lenihan
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Committee for Ireland

2022 – 2023

The following is the Committee as elected at the Annual General Meeting in the National Botanic Gardens, Glasnevin, on Saturday 24th September 2022. Office bearers were subsequently elected at the first committee meeting. The Committee is now:

Robert Northridge (Chair)
Shane Brien (Joint Hon. Secretary)
Kim Lake (Joint Hon. Secretary)
Mark McCorry (Vice-Chair and Field Meetings Secretary)
Oonagh Duggan (Hon. Treasurer)
John Faulkner
Alexis FitzGerald
Ciarán Flynn
Jessica Hamilton
David McNeill
Cilian Roden

The following are nominated observers to the committee:

Lorna Somerville (Department of Agriculture, Environment and Rural Affairs)
Mike Wyse Jackson (National Parks & Wildlife Service)

Draft Minutes of the BSBI Irish Branch AGM 2022 are available at:
<http://governance.bsbi.org/ireland>

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Front cover photo: *Epipactis phyllanthes* (Green-flowered Helleborine) inflorescence at Villierstown, Co. Waterford (**H6**). Photo A. Malcolm © 2022 (p. 78).

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Notes from the BSBI Ireland Officer – Paul Green

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2022 was an exceptionally busy year for me as the BSBI Ireland Officer. 2023 looks like it will be even more busy as there is so much going on this year across Ireland.

It is great to report that Tanya Slattery has been appointed the new Vice-county recorder (VCR) for Co. Limerick, taking over from Sylvia Reynolds who retired from the post in March 2022. After Co. Waterford having no VCR for over three years, the vacancy has been filled by three joint VCRs: Ann Trimble, Andrew Malcolm, and Julie Larkin. Eamon Gaughan has filled the shoes of the late Don Cotton and becomes VCR for Co. Sligo. Cliona Byrne has stepped down as joint VCR for Co. Louth, and we soon filled this position with Ciarán Flynn becoming joint VCR with Kate Harrington. Ciarán is the baby amongst VCRs as he is our youngest. And finally hot off the press, George Smith has just become joint VCR with Con Breen for Westmeath. I wish them all the best in their new voluntary roles, and you can read more about each of them on page 3.

If you live in the very north-west and would like to give it a go as a Vice-county recorder, why not put your name forward to become joint VCR with Ralph Sheppard for West-Downegal! Ralph would be very keen to mentor a successor to take over from him in a few years.

Spring Conference 2023

This will take place as a face-to-face live meeting at the National Botanic Gardens, Glasnevin on Saturday 22nd April. This will be our first live Spring Conference since 2019.

Aquatic Plants Project 2023

We are hoping to run this project again this year. It will be very similar to what we did last year, with a couple of webinars and field training days. We will also hope to have at least one field day where we try and re-find a very rare aquatic plant at a site where it hasn't been seen for some time or survey a rare species.

Atlas 2020

After all the work BSBI members and non-members put into recording for Atlas 2020, our fruits have ripened as '*Plant Atlas 2020*' will be published in March this year. There are planned Atlas launches across Ireland and the UK. Here in Ireland, we are having two launches. The first is being held at the National Botanic Gardens, Glasnevin on 9th March, and second is taking place at the Ulster Museum in Belfast on 15th March.

New Year Plant Hunt (NYPH)

The NYPH took place from 31st December 2022 through to 3rd January 2023 and was again a great success. 1003 lists were submitted from across Ireland and the UK. With three from Ireland making the top 20 which is very impressive! I introduced the Wexford Naturalists' Field Club to the hunt. 11 of us had a walk around Wexford town, this included a break to take lunch in a hotel, before we continued for another hour. We had such a good time that

the club is going to make the NYPH an annual event. If you haven't done the NYPH with your local group, why not try it out in 2024.

And finally, I hope to meet many of you at our conferences and field meetings this year.

Vice-county Recorder vacancies

George Smith has agreed to become joint VCR for Co. Westmeath (**H23**), alongside the incumbent Con Breen, who intends to retire from his longstanding post in two years' time.

We currently have just one Vice-county vacant, namely, Co. Cavan (**H30**). If you would like to coordinate records for Cavan, with a view to becoming a VCR, or want more details about what is involved, please get in touch with our Ireland Officer, Paul Green – paul.green@bsbi.org.

Introduction from newly appointed Vice-county Recorders

Waterford (H6)

Ann Trimble, Andrew Malcolm, Julie Larkin

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Ann Trimble was raised in Glasnevin, not far from the National Botanic Gardens which was a frequent Sunday outing for her when she was a child. She has been fascinated by wild plants all her life and although she has no formal ecological education, she endeavours to accumulate knowledge by reading as many plant books as she can and attending BSBI outings to pick up identification tips. She lives in Lismore with her husband and fellow VCR Andrew Malcolm. She looks forward to learning more about wild plants and perhaps re-finding some lost "treasures" and also to visiting parts of County Waterford which she may not have visited before in a quest to records species.

As a child Andrew Malcolm was very fortunate to have parents with a great interest in the natural world around us. His mother in particular had a passionate awareness for native flora and one of the most memorable experiences of her life was a springtime visit to The Burren. Her obsession must have rubbed off on Andrew to an extent, an interest that was rekindled in later years by his wife and fellow VCR Ann Trimble's great passion for the plant life she was finding in our vicinity. Like Ann, he has no formal education or training in the subject but makes up for that in enthusiasm and curiosity.

Unlike Andrew and especially Ann, who became botany buffs at a young age, Julie discovered her love of plants at a later stage in life. As a child, Julie's main passion was animals, which eventually led to her attending University College Dublin as a mature student to study zoology. This, in a somewhat roundabout fashion, subsequently led to her obtaining a B.Sc. (Hons) in Ecology from University College Cork. Once she had that primary degree under her belt, she pursued an M.Sc. in Ecological Assessment and finally a Ph.D. in Agri-ecology, which had a heavy emphasis on botanical species identification. It

was those later (numerous!) years in university that ignited Julie's love of plants and allowed her to eventually build a career around that love. She is currently employed as a Senior Project Ecologist for RPS and is based out of the Cork office.

Limerick (H8)

Tanya Slattery

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Tanya, an ecologist living and working in Limerick, was hoping to share the role of Vice County Recorder in Limerick, but has yet to find someone to join her in the role. Tanya has been a member of BSBI for a long time and used to go out with the Clare local group as well as submitting rare records for Limerick when encountered. Tanya graduated as a mature student with a botany degree from NUI Galway in 2010, and followed on with a MSc in Ecological Assessment from UCC and a second research masters also from UCC a few years later. She worked in the SPPA for a few years doing shoreline surveys and then as a consultant ecologist for another few years before more recently joining the team of ecologists in DAFM. Tanya spends a lot of her working time assessing Annex I habitats. She is very organised and enjoys coordinating events and getting people enthused about nature. Tanya feels rusty in her recording skills and wishes she could do the role full time however family, work and other volunteer commitments tend to get in the way. Limerick has a very strong active community in nature and Tanya looks forward to having a few events here in 2023. Hopefully a volunteer will come forward to share the role soon.

Louth (H31)

Ciarán Flynn, *Castlecarragh, Riverstown, Dundalk, Co. Louth*

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Ciarán is from the Cooley peninsula in the north of Co. Louth (**H31**). Currently, he is studying for a Bachelor's in Zoology at Trinity College Dublin. He has had a lifelong interest in natural history. Groups of interest include birds, butterflies, and dragonflies. His interest in botany was stimulated by many trips through the Cooley mountains. BSBI field meetings to various counties and outings with the Dublin Naturalists' Field Club have helped him develop his botanical skills. Along with co-VCR Kate Harrington, he is eager to further explore his home county, especially less-visited sites in mid- and south Louth. Anyone interested in botanising in Co. Louth can get in touch via email. There is also a WhatsApp group for coordinating recording trips and for discussing any interesting finds.

Flora of County Wexford

The first *Flora of County Wexford* was published in late December 2022.

Author: Paul Green

The Flora is A4 in size and runs to 600 pages.

The Flora has 82 introduction pages. Followed by the species accounts, which covers all 1,700 species found growing wild in the county. For each species account it describes the habitats the plant is found in, etc. The very rare species have all the known sites listed. There are many photos throughout the book, including those of nearly all the rare native plants.

The Flora was published privately by the author with grants from BSBI, NPWS and WNFC. The Flora can be purchased for €30/£30 per copy, plus €9/£9 for p&p for those living on the island of Ireland. Postage to the UK will be much more expensive.

To order your copy contact Paul at: paul.green@bsbi.org or mobile: 087 7782496.

Paul Green

Taxonomic delimitation within the genus *Rosa* L. (Wild Roses) Section *Caninae* DC. (Dog-roses) in the continental European, British and Irish flora: some underutilised, and some hitherto overlooked, morphological diagnostic characters

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Abstract

Currently, work is in progress on updating and revising the *Rosa* monograph, *Roses of Great Britain and Ireland* (Graham & Primavesi, 1993). Consequently, the time is now appropriate for highlighting critical morphological delimitation criteria for the predominantly European *Rosa* L. (Wild Roses) section *Caninae* DC. (Dog-roses) – characters that seem to have been totally overlooked to date in the taxonomic study of this section over Europe as a whole, together with other useful diagnostic characters for sect. *Caninae*, that are inexplicably underutilised at the present time. Moreover, in order to put the biology and taxonomy of sect. *Caninae* in context within the genus *Rosa*, an outline is provided of the distribution of this genus worldwide, together with some comments on the intrinsic biological factors that account for its awesome taxonomic complexity. This bewildering, and seemingly intractable taxonomic problem, has led to a major impasse and conflict between traditional, pragmatic, diagnostic taxonomic accounts, and modern-day molecular techniques, which latter reject (on phylogenetic grounds) most of the ‘workable’ traditional taxonomic subsections within, for example, sect. *Caninae*. Yet, to date, these molecular techniques have proved unable to satisfactorily clarify the evolutionary history of the critical genus *Rosa* (cf. Ritz & Wissemann, 2003; Koopman *et al.*, 2008; Fougère-Danezan, *et al.* 2015), or to offer an alternative, viable, taxonomic framework for it.

Introduction

The woody genus *Rosa* L. (Wild Roses) is indigenous to the Northern Hemisphere, where it is of widespread and common occurrence in Europe, Asia and North America, in temperate and subtropical climates, while a single, *tropical* species – *R. abyssinica* R. Br. – is found in the East African countries of Ethiopia and Somalia, and has further disjunct Asian stations in Saudi Arabia and Yemen (Glen & Hardy, 1987; Phillips & Rix, 2004). Worldwide, most *Rosa* species are normal-balanced diploids or polyploids – with the *major exception* of sect. *Caninae* DC., which latter has its *core* indigenous base in Europe, with outlier native populations for some species in Asia and North Africa, while many species of this section are now widely naturalised globally. Section *Caninae* is characterised by a *unique* breeding system that is often described as ‘pseudo-sexual’ and consists of numerous, unbalanced, polyploid (mainly pentaploid) taxa, which is discussed in detail elsewhere in this paper.

Rosa taxonomy and distribution worldwide

On a global basis, the taxonomy of the genus *Rosa* is notoriously complex, due to the following suite of contributing and interacting factors. **1.** Historic, rampant interspecific hybridisation between *all* cohabiting species. **2.** The fact that *any* particular binary interspecific hybrid within sect. *Caninae* can occur as either **(a)**, a relatively ancient, geographically widespread, morphologically stable (and thus recognisable) taxon, whose historical parents are *not* readily identifiable; or **(b)** a ‘modern-day’ spontaneous, sporadic, polytopic taxon, displaying *polymorphism*, as each (localised) hybrid iteration *exhibits a different combination of characters* – though paradoxically, the identities of its *parental* species are readily ascertainable in most cases. **3.** Environmental factors can greatly modify growth-habit and some other morphological characters, producing spuriously distinctive, eco-geographical ‘species’ – as exemplified by many North American taxa of sect. *Cinnamomea* (see later notes with regard to this situation). **4.** Numerous morphological variants, together with a plethora of interspecific hybrids of dubious parentage and morphological stability, have been given unwarranted species recognition in the past, in Europe, Asia and North America (see later notes). **5.** Introgression, through gene flow, is of widespread and frequent occurrence worldwide, and can transmit *anomalous* morphological features into *non-glandular* species, such as the presence of scattered stipitate-glands on pedicels and/or sepal-pinnae, *or* the presence of *sparse* foliar pubescence in typically *glabrous-leaved* species. **6.** Within sect. *Caninae* especially, binary interspecific hybrids frequently cross with a wide range of species, to produce hybrids of *triple* parentage (see **Plates 5a & 5b** and captions). Yet these complex hybrids are *commonly overlooked* in the field, or, if suspected to occur, their triple-parentage identity, often defies accurate determination, given the *lack* of distinctive morphological features contributed by the third species. **7.** *Total or partial self-incompatibility* occurs in some European and Asian species (e.g. *R. spinosissima* L. (Burnet Rose) and *R. rugosa* Thunb. (Asian Rose/Wrinkled-leaved Rose) respectively), while this phenomenon may be of widespread (but overlooked) occurrence in North American species (O’Mahony, 2021). **8.** *Polyploidy* is commonplace, some of the polyploids having multiple hybrid origins (Joly *et al.*, 2006). **9.** *Apomixis* is also a confounding factor in the biology of the genus *Rosa*, though as yet, the frequency of its occurrence worldwide, remains to be ascertained. **10.** The essentially European section *Caninae* (*all* unbalanced polyploids of hybrid derivation) has its own definitive breeding

system (see later notes). **11.** Critical determination of taxa is greatly hampered by the *paucity* of distinctive morphological features within the genus *Rosa*, as its *architecture* is remarkably conservative, with few species (or species aggregates) exhibiting *unique* morphological features: instead, most species within each subsection share a common pool of characters in various combinations. Consequently, it is understandable why there is *still* no consensus among rhodologists, as to how many genuine species exist worldwide, despite some three hundred years of *Rosa* study!

Nevertheless, some recent attempts *have* been made to provide a species number for this genus globally, and for its various subgenera and sections. For example, Bruneau *et al.* (2007) estimated the overall number of species at *c.* 190, while fougère-Danezan *et al.* (2015) placed the number at between 150-200 species, and commented that: “Approximately half of the rose species occur in Asia, while Europe and North America host approximately a quarter of the species each.” Phytogeographically, ninety-five species are recorded in the *Flora of China* (Gu & Robertson, 2003), of which sixty-five are *endemic*. Moreover, while Asia is the world headquarters for sect. *Synstylae*, its core base is China, which holds some twenty-six of its *c.* thirty-five currently known species – a very distinct section of predominantly *climbers, scramblers and trailing* species (the majority diploids), in which *the styles are fused into a column that projects 3-8 mm above the hip disc*. In stark contrast, Britain and Ireland support only *one* native species of sect. *Synstylae*: the beautiful *Rosa arvensis* Huds. (Field-rose), while a second indigenous species occurs in Continental Europe and Asia, namely, the evergreen-leaved, *Rosa sempervirens* L. (Evergreen-rose). In similar vein, only *one* species of sect. *Synstylae* is native to North America: *R. setigera* Michx. (Climbing Prairie-rose), this being the *only* known *dioecious* species of the genus *Rosa*, its flowering populations either functionally male or female. On the other hand, the predominantly European section *Caninae* (Dog-roses), consists of approximately *fifty* species, according to Wissemann (2003: 114), but the true species number is still far from certain, bearing in mind the fact that mainland European rhodologists have long given *unwarranted* species status to taxa that are manifestly ‘modern-day’ interspecific hybrids, whose extant parental species can usually be identified with a high degree of certainty (cf. Bakker *et al.*, 2019). Lastly, the notoriously morphologically variable section *Cinnamomeae* DC., is distributed throughout Europe, Asia and North America, but here, also, there is considerable uncertainty as to the number of *genuine* species it contains (currently variously estimated at between fifty and eighty species) – no doubt the frequency of interspecific hybrids within this section, accounting for much of this uncertainty. (**Note:** As most native *Rosa* taxa in North America belong to sect. *Cinnamomeae*, its taxonomy therein, presents almost insurmountable problems with regard to species delimitation, considering the fact that the morphological plasticity of the offspring of many species, commonly displays a bewildering variety of *non-correlated* features *that go far beyond* the morphological parameters of the parent species themselves! Attesting to the reality of this phenomenon, Erlanson (1934) in a paper entitled: ‘Experimental data for a revision of the North American wild roses’, stated that her cultures of *R. carolina* L. (Carolina Rose) from *individual* wild plants, produced offspring that could be referred to *six* other species, and that this situation was mirrored with many other of her cultured species of this section. Moreover, at a later date, her observations were corroborated and buttressed by the comments of Lewis *et al.* (2014), when they stated that: “At least 25 species names have

been proposed to accommodate variation ... within *Rosa woodsii* ...” One unfortunate *historical* consequence of this conundrum in North America, was that numerous phenotypically plastic rose interspecific hybrids (in addition to their morphologically segregating offspring), were erroneously given species status – a situation that took many decades to rectify. Erlanson (1934) also provided an enlightening diagram of North American synthesised F1 interspecific hybridisations (within sect. *Cinnamomeae*) that she had undertaken, involving thirteen parental species (diploids, tetraploids and hexaploids). Her results revealed *full hip fertility* in the offspring of hexaploid x hexaploid species crosses, and of *some* tetraploid x tetraploid and diploid x diploid species crosses. Moreover, the (triploid) F1 offspring of her diploid x tetraploid species crosses proved *wholly sterile*, while some diploid x hexaploid F1 hybrids bore occasional, partially achene-fertile, hips. No doubt with this bewildering overall situation in mind with regard to sect. *Cinnamomeae*, Lewis *et al.* (2014), in their excellent *Rosa* account for the *Flora of North America North of Mexico*, stated: “Character states often are part of a continuum, instead of being discrete. When addressed by differing taxonomic philosophies, radically different treatments of *Rosa* in North America, have resulted.”) Wissemann & Ritz (2007) succinctly summed up the characteristics of the genus *Rosa* in the following way: “... a remarkable genus with respect to systematic biology. Multiple reproductive strategies ranging from apomixis to outcrossing including hybridisation, as well as different modes of character inheritance like matroclinal, paternal, or sex unrelated ones. This complexity makes the genus a model in which simple concepts of radiation, speciation and taxonomy, come to their limits.”

The Taxonomy of *Rosa* Section *Caninae* in Continental Europe, Britain and Ireland

In past centuries, the study of the complex taxonomy of *Rosa* section *Caninae* in mainland Europe, was, to a considerable extent, *independent* of similar research being undertaken in Britain at that time. Consequently, British rhodologists conferring with some of their Continental colleagues, found relatively little common ground in the naming of taxa (cf. Wolley Dod, 1936) – a disheartening and frustrating state of affairs for everyone concerned with the study of European *Rosa*. Yet, at an earlier date, the Belgian rhodologist, Francois Crépin, tried to build a bridge between the Continental and British *Rosa* taxonomic treatments (cf. Crépin, 1889), while his long-term, eminently laudable taxonomic research and publications on European *Rosa*, laid the foundations for a practical, *workable* treatment of this genus (*especially* section *Caninae*) both in mainland Europe and in Britain and Ireland. The late Ronald Melville, a former BSBI *Rosa* Referee, in a paper entitled: ‘The problem of classification in the genus *Rosa*’ (Melville, 1967), outlined and praised, the remarkable pioneering taxonomic work on European *Rosa* by Crépin, and noted that the longed-for key to the elucidation of sect. *Caninae* that Crépin had sought so avidly (if vainly) for, was subsequently provided by Täckholm (1920), in an original and vitally important paper, that presented a summary of his researches in the *cytology* of the genus *Rosa*. Commenting on this latter work, Melville (1967: 41-42) stated: “Within the genus [*Rosa*] he [Täckholm] found not only normally sexual diploids, tetraploids and hexaploids, but also unbalanced polyploids [i.e. sect. *Caninae*], which latter reproduce by a remarkable process that has been called ‘pseudo-sexual’.” Whilst highlighting this momentous discovery, Melville nevertheless stressed that: “Although we have the key, it is by no means easy to apply it to the unravelling of our problematic [caninoid] roses.” Subsequently,

Klásterský (1968), in his account of the genus *Rosa* for *Flora Europaea* 2; Melville, in his account of *Rosa* hybrids for the work, ‘*Hybridization and the Flora of the British Isles*’ (Melville in Stace, 1975); and Graham & Primavesi (1993) in their monograph, ‘*Roses of Great Britain and Ireland*’, provided more readily available detail on the complex reproductive process within *Rosa* sect. *Caninae* – a unique breeding system that nowadays is often termed ‘*canina*-type meiosis’, in which *four-fifths* of the chromosomes are inherited from the seed parent, and only one genome from the pollen parent. As a consequence of this massive genetic imbalance, the morphological features of binary interspecific hybrids within sect. *Caninae* generally very closely resemble their female parent (matrocliny), so that their *reciprocal* hybrids look very different in visual appearance. Graham & Primavesi (1993:13-14), noting the frequency of interspecific binary hybrids within sect. *Caninae*, commented: “Indeed, a little thought might well lead one to wonder why, with such a propensity for hybridization, the taxa which are now recognized as species, have not long ago disappeared, leaving a single species showing a mixture of all the available characters.” Then, they part-answered their own question by stating: “...the majority of the inheritable characters, *four-fifths* in most cases, are determined by the seed parent. Also, when the seed parent belongs to this section [sect. *Caninae*], *three-fifths* of these characters are transmitted unchanged to successive generations [my emphasis]. This may be a further factor in maintaining the stability of species.” Despite the long history of recording of *Rosa* sect. *Caninae* in Europe, *considerable confusion* in delimiting species and binary interspecific hybrids, still prevails to this day, as noted earlier in this paper. For instance, many taxa long accepted as species in Continental Europe (cf. Klásterský, 1968; Wissemann, 2003; Kurtto *et al.*, 2004) are regarded as ‘modern-day’ interspecific hybrids in Britain and Ireland (cf. Bakker *et al.*, 2019). To take but one example: the taxon known as *Rosa pseudoscabriuscula* (R. Keller) Henker & G. Schulze over much of mainland Europe, is, by contrast, attributed to the interspecific hybrid, *R. tomentosa* Sm. x *R. sherardii* Davies (and its reciprocal) in Britain, Ireland, and parts of Continental Europe, and is known by the binomial, *Rosa* x *suberectiformis* Wolley-Dod, given that *it clearly exhibits* a (variable) mix of morphological characters contributed by both of these species. In their Introduction to the genus *Rosa* in the work, *Atlas Florae Europaeae*, Kurtto *et al.* (2004) despairingly commented: “It is highly improbable that a generally approved classification of the extremely complicated variation of the genus will ever be achieved, i.e. the present situation of several widely diverging classifications will almost certainly continue, though possibly becoming somewhat more uniform.” Nevertheless, they made a valiant attempt in this highly important work, to make available to all European rhodologists, a précis of the currently available morphological and molecular literature reference data, with which to (hopefully) critically evaluate the taxonomic status of most contentious taxa. On a more positive note, Bakker *et al.* (2019), in a paper entitled: ‘Dog-roses (*Rosa* sect. *Caninae*): towards a consensus taxonomy’, have emphasised the need for a general consensus on species and interspecific hybrid delimitation with regard to the caninoid *Rosa* taxa of northern, western, and central Temperate Europe, including Britain and Ireland. If this initiative achieves traction, it would be a major first step towards a meaningful, unified taxonomy for *all* European caninoid *Rosa*, helping to bring welcome taxonomic order out of chaos. Some idea of the magnitude (and challenge!) of this undertaking over Europe as a whole, can be gleaned from the fact that fifty-three

interspecific hybrids *within* sect. *Caninae* are currently known to occur in Britain and Ireland, while the figure rises to seventy-three hybrids when crossings between sect. *Caninae* and other *Rosa* sections are included (Bakker *et al.*, 2019).

The search for morphological character-correlation delimitation aids within Section *Caninae*

During the long-term historical study of *Rosa* sect. *Caninae* in Europe, it became evident to rhodologists, that certain morphological characters *are correlated*, and that such character-couplings *act as invaluable delimitation aids* in the taxonomy of this section, as they allow two, informal, groups to be recognised (i.e. **D phenotype** and **L phenotype** species groups) – as recently highlighted by Ritz & Wissemann (2003) and Bakker *et al.* (2019). (**Note:** See **Plate 1** and its caption, showing and describing comparative vertical-sections of hips of both **L & D** species phenotypes.) Moreover, a *third* informal group is represented by the intermediates (i.e. interspecific hybrids) between the **D** and **L** phenotypes, and these are known as **D/L phenotypes** (see **Plate 4b** and caption). The first two species groups, display the following (contrasting) suite of morphological characters:

D phenotypes: bushes dense, often squat, upright; **hip disc** flat or variably concave, its **stylar orifice** over 1.2 mm in diameter and *c.* 1/3 or more the width of its disc; **stylar bundle** stout, with dense, appressed, subtranslucent-sericeous hairs (these usually totally masking the dull, reddish-brown style colour), the partially-exserted **styles + stigmas** forming a compact, flat or high-domed head, that covers most or all of the disc; **sepal-posture** erecto-patent, erect, or connivent after anthesis, and *tardily deciduous* at the fruit stage (e.g. *R. sherardii*, *R. vosagiaca*, *R. caesia* and *R. rubiginosa*) or *fused permanently by their swollen bases*, to the hip (e.g. *R. mollis* and *R. villosa*).

L phenotypes: bushes lax, tall, arching; **hip disc** flat, domed, subconical or conical, its **stylar orifice** *c.* 0.25-0.8 mm in diameter, and 1/5 to 1/6 the width of its disc; **stylar bundle** slim, glabrous to variably hairy (the hairs *not* masking the dull, reddish-brown style colour); the partially-exserted **styles + stigmas** forming a loose, splayed head, *or* a narrow, tight, sometimes encrusted head, little wider than the stylar orifice; **sepal-posture** after anthesis, mostly patent to recurved, the sepals often disarticulating whilst the hips are still green, hard-textured and immature, and certainly before hip-ripening (e.g. *R. canina*, *R. corymbifera*, *R. micrantha* and *R. tomentosa*)

(**Note:** My long-term study of these **D & L** species phenotypes in *Rosa* sect. *Caninae* on the island of Ireland, has highlighted some *additional*, correlated, diagnostic morphological characters within both groups, which are outlined here.)

Additional D phenotype correlated diagnostic characters: **hip discs** often deeply concave/bowl-shaped (e.g. *R. sherardii*); **stylar bundle** commonly wide and short (only 4-6 mm long) and removable *as a unit* from the hip, as its dense, entangled hairs bond the styles together; **lip** of the **stylar orifice**, and the **stylar channel walls**, \pm smooth; **stylar channel** very short, *its walls often dilated inwardly*, so that the achenes can clearly be seen, following on removal of the stylar bundle; **sepal-bases** commonly only 3.5-4.5 mm wide

(in subsections *Vestitae* and *Rubigineae* only); **mature hips** bearing a terminal, hypanthial (fleshy) rim *c.* 0.5-1.5 mm high [see **Plate 2** and its caption] which is topped by the transverse **sepal-scars**, the latter *placed high above* the (usually concave) **hip disc**.

Additional L phenotype correlated diagnostic characters: **hip discs** *never* concave-shaped (e.g. *R. canina*, *R. corymbifera*, *R. tomentosa*, *R. agrestis*, *R. micrantha*); **stylar bundle** 7-9 mm long, often only sparsely pubescent, and thus *separating readily into individual strands* on removal from the hip; **lip of stylar orifice**, and **stylar channel walls**, characteristically *corrugated* (i.e. *ridged-and-furrowed*); **stylar channel** *very narrow and usually long-cylindrical to below the level* of the **sepal-scars**, the achenes thus *not* visible on removal of the stylar bundle; **sepal-bases** (in subsect. *Caninae* only) commonly 5-6 mm wide; **mature hips** generally *lacking* a terminal, hypanthial (fleshy) rim, so that the transverse **sepal-scars** are either *at* the level of the flat disc, or *below* the level of the domed or conical disc (see **Plate 3** and its caption).

(**Note:** Inexplicably, the British *Rosa* literature *fails* to mention – and therefore overlooks – the diagnostic value of the *concave* disc character in the species *Rosa caesia* and *R. vosagiaca*, and of its frequent manifestation in their interspecific hybrids also, as detailed in this paper.)

D/L phenotypes in section *Caninae* – a source of underutilised diagnostic aids in interspecific hybrid detection and diagnosis

D/L phenotypes in *Rosa* section *Caninae*, represent interspecific hybrids between the **D** and **L** species phenotypes, and their inherited stylar orifice diameter/hip disc diameter ratio can, on occasion, *also* be utilised as an invaluable diagnostic aid for establishing the *direction* of a particular binary cross (see **Plate 4b** and its caption). With regard to *inherited stylar orifice diameter*, and *orifice diameter/disc diameter ratio* in **D/L** taxa, I commented in a previous paper (O'Mahony, 2003: 12): "... in a cross between two small-orificed species, their interspecific hybrid will *always* inherit a small stylar orifice, irrespective of the direction of that cross. A corollary to this is, of course, that in a cross between two large-orificed species, the resultant hybrid will always bear a large stylar orifice. However, in a cross between small-orificed/large-orificed species [i.e. **D/L** hybrid derivatives] the inherited stylar orifice size *is generally unpredictably variable* (whatever the direction of the cross), yet can, on occasion, prove of crucial importance in clinching a hybrid determination." An excellent example of this phenomenon is displayed by the cross *R. corymbifera* x *R. sherardii* (O'Mahony 2022), their hybrid unexpectedly exhibiting a *disproportionately large* suite of hip characters clearly derived from its *pollen* parent (*R. sherardii*) namely: **stylar orifice** *c.* 1.2-1.5 mm in diameter, and 1/4-1/3 the width of its *concave disc*; **stylar bundle** short (4-5 mm long), stout, and densely appressed-hairy; both the **lip** of the **orifice**, and the **stylar channel**, \pm *smooth-walled*; **sepals** *erecto-patent and tardily deciduous* at the fruit-ripening stage. In marked contrast however, in the cross, *R. vosagiaca* x *R. tomentosa* (added to the Irish Flora from East Cork (**H5**) in August 2022 – see **Plates 4a & 4b** and captions), the moderately *large stylar orifice* (1.2-1.4 mm in diameter and 1/4-1/3 the width of its disc), the *shallowly concave* disc, and the *glabrous, non-glandular* leaves (the upper face of its leaflets with a removable, waxy, glauco-pruinose

bloom, and the lower face permanently glaucous) – were inherited from its *female* (*R. vosagiaca*) parent, while the *male* characters inherited from its *R. tomentosa* parent, were the long styles (7-9 mm), the *early-deciduous* sepals (falling while the hips were still hard, immature and green), and the presence of minute, *R. tomentosa*-type stipitate-glands on the sepal-backs, pinnæ, leaf-rachides and some pedicels. In similar fashion, the hybrid cross, *R. vosagiaca* x *R. canina* (= *R. x dumalis*) that I found cohabiting with its parents in a hedgebank bordering the Coomhola River road in the Shehy Mountains region of West Cork (H3, W03.59.) in September 2004, *also* largely inherited its suite of *hip* characters from its *female* parent, *R. vosagiaca*, though its sepals were *recurved and early-deciduous* on the hips, as in its *pollen* parent, *R. canina*. To illustrate another aspect of the *unpredictability* of character inheritance in *Rosa* section *Caninae* **D/L** phenotypes, *all* Irish material of the cross, *R. micrantha* x *R. rubiginosa* that I have recorded to date, displayed the *small* styler orifice and recurved, deciduous sepals of its *female* parent (*R. micrantha*), while the *most conspicuous* and diagnostic input of its *male* (*R. rubiginosa*) parent, *was the variable display of acicles* on the branches beneath the inflorescences/infructescences.

Given the frequently invaluable diagnostic usefulness of these characters for confirming *the direction* of certain crosses in **D/L** phenotypes in sect. *Caninae*, it is most surprising to find that their use in the British *Rosa* literature to date, has been *both underutilised and haphazard*. Moreover, it is ostensibly *baffling* to note that Ronald Melville, in his *Rosa* hybrid account for the work, ‘*Hybridization and the Flora of the British Isles*’ (Melville in Stace, 1975), *never once* utilised these often critical delimitation aids in his description of *forty-three* binary interspecific hybrids – though their *non-application* almost certainly led to some erroneous hybrid determinations in his account. (**Note:** As a novice rhodologist in the early-1970s, my first (and only) contacts with Ronald Melville occurred within the time period October 1974 to March 1976, when I sent him County Cork (H3-H5) native *Rosa* material for determination, in addition to querying him on a range of *Rosa* taxonomic problems that I was grappling with at that time. In this regard, I found Ronald Melville to be a very courteous and helpful BSBI *Rosa* referee. In the course of these communications, I raised the subject of *styler aperture diameter/hip disc diameter ratio* as a possible diagnostic aid in what we would now term **L/D** interspecific hybrids within *Rosa* sect. *Caninae*. His answers to my two, separate queries on this matter (see below), *provide some insights* as to why he did *not* use this diagnostic aid in his account of *Rosa* interspecific hybrids in the work, *Hybridization and the Flora of the British Isles* (Melville, in Stace 1975). For example, I first raised this matter in a letter to him in January 1976, and his reply (in litt. 2nd February 1976) was: “I have not made a special study of the size of the aperture in British roses; I am not so hopeful as you are, that it may prove to be of exceptional usefulness ...” On broaching this subject for a second time in a letter to him on 19 February 1976, he stated (in litt. 10 March 1976): “Again, in connection with the size of the [hip disc] orifice, I feel you are tending to lay too much stress on this character. Bear in mind once more, the possibility of polygenic inheritance and considerable variation [in styler aperture diameter in **L/D** interspecific hybrids] in consequence.”)

Rosa section *Caninae*: some overlooked, fundamental, morphological delimitation characters at the subsection level

As noted earlier in this paper, *Rosa* sect. *Caninae* has its *core* world indigenous base in mainland Europe, its British and Irish species and interspecific hybrids representing *but a portion* of the overall number of taxa present therein. Section *Caninae* is represented in the British and Irish flora by three subsections: (1) *Caninae*; (2) *Rubigineae*; (3) *Vestitae* – the first two subsections containing six and three indigenous species respectively, the third containing four species, of which three are indigenous, the fourth (*R. villosa* L.), a presumed long-naturalised species from Continental Europe, that is currently recorded from a handful of British sites, but is not presently known to occur on the island of Ireland.

During the course of my initial *Rosa* fieldwork in County Cork (**H3-H5**) in the mid-1970s, it soon became apparent that the *leaf stipule-margin glands* of all three subsections, shared a common feature, namely, a single row of glands, in which each large (primary) gland alternates with a much smaller, sessile gland. However, more detailed and protracted studies in subsequent years, revealed that the stipule-margin glands of subsect. *Caninae*, differ radically from those of subsections *Rubigineae* and *Vestitae* in a number of fundamental features – *being different in shape, and of a different order of magnitude* (i.e. much larger-dimensioned) than the corresponding glands of subsections *Vestitae* and *Rubigineae*. In addition, the stipule-margin glands of subsect. *Caninae* are *fugacious*, whereas in the other two subsections they remain *permanently attached* to the stipules. A useful adjunct delimiting feature is that *both* stipule surfaces of species (but *not* binary interspecific hybrids) within subsect. *Caninae*, are *totally devoid* of glands, whereas in subsections *Rubigineae* and *Vestitae*, the *lower* (abaxial) surface of the stipule frequently bears few-to-numerous, minute, *odorous* stipitate-glands of varying size, these glands *apple-scented* in subsect. *Rubigineae*, and *resin-scented* in subsect. *Vestitae*. This suite of highly significant differentiating morphological characters, can be summed up thus:

Subsection ***Caninae***: Primary stipule-margin glands *ovoid or lanceoloid*, the *largest* c. 0.24-0.40 mm in length; *each gland much longer than, feebly attached to, and swivelling on, its minutely denticulate base, and very quickly disarticulating from its base* (i.e. *fugacious*) – thus leaving an apparently eglandular stipule margin on older leaves.

Subsections ***Vestitae & Rubigineae***: stipule-margin glands with *stout stipes* (equalling or longer than their glands), *the stipes rigid, patent, and permanently attached to the stipule-margin*; each gland *subglobose* (when fresh and full of volatile oils), the largest primary glands c. 0.13-0.16 mm in diameter), *each gland permanently attached to its stipe*.

Even in *withered* leaves of subsections ***Vestitae*** and ***Rubigineae***, these stipule-margin glands *remain in place*, whereas, as stated above, in subsect. *Caninae*, the corresponding stipule-margins of old or withered leaves will be *devoid* of glands – though these latter can be found in abundance on the leaf stipules of *1st-year, sterile, vegetative shoots*, when these are produced early in the following year. These stipule-margin glands can also act as *subtle* indicators of *gene flow* between species in all three subsections of section *Caninae* when, for example, some *ovoid/lanceoloid* glands (of subsect. *Caninae*) are found *intermixed* with the *subglobose* glands characteristic of subsections *Vestitae* and *Rubigineae* – and vice versa. Right up to the present day, the *true* nature of the stipule-margin glands in subsect. *Caninae* has been *misinterpreted* in the British *Rosa* literature and, consequently, their use

as diagnostic aids *has been totally overlooked*. (**Note:** It remains to be ascertained if the stipule-margin characters outlined in this paper for subsect. *Caninae*, hold good as diagnostic aids, throughout the European range of this subsection.)

Traditional morphology-based *Rosa* taxonomy versus modern-day phylogenetic taxonomy

The foundational taxonomic framework for the professional study of the genus *Rosa*, was initially put in place by workers such as Christ (1873) and Crépin, 1889, 1894). Indeed, the modern-day taxonomy of this genus worldwide, is based on Crépin's research, subsequently updated by Rehder (1940) and Wissemann (2003). Given its practicality for identification purposes globally, rhodologists have generally accepted this long-standing (and eminently convenient) morphological framework, although there is *still* no consensus taxonomic agreement with regard to the delimitation of species within the notoriously complex caninoid roses (sect. *Caninae*) of Europe (e.g. Bakker *et al.* 2019), or of the representatives of the equally rampantly hybridised sect. *Cinnamomeae* complex, that are indigenous to North America (e.g. Erlanson, 1929, 1934, 1938; Joly *et al.*, 2006; Joly & Bruneau, 2007; Lewis *et al.*, 2014). However, in relatively recent years, *molecular* taxonomists have repeated stated that the current, conventional taxonomic treatment of the genus *Rosa* (based purely on morphological characters), while undoubtedly practical for both section, subsection, species and interspecific hybrid identification, *is artificial*, as it does *not* accord with the actual evolutionary historical development of the genus, as (partially) gleaned from phylogenetic studies (cf. Ritz & Wissemann, 2003; Koopman *et al.*, 2008; Fougère-Danezan *et al.*, 2015) and, consequently, needs replacement. Yet, the useful and enlightening overview of such molecular marker studies provided by Fougère-Danezan *et al.* (2015) clearly shows that many of these molecular studies *have produced conflicting or inconclusive results*, and, therefore, have *no* alternative *Rosa* taxonomic framework to offer at present, as a replacement for the traditional, long-serving model. All the more surprising, therefore, to note that Ritz & Wissemann (2003), in a paper entitled: 'Male correlated non-matrocinal character inheritance in reciprocal hybrids of *Rosa* section *Caninae* (DC.) Ser. (Rosaceae)', have utilised *traditional* morphological characters to 'establish' a tentative (and highly speculative) *phylogenetic* initiative.

The premise for their initiative, is based on "statistically significant data" derived from their cross-breeding experiments, which involved undertaking reciprocal crossings of *five* species from section *Caninae*, these species including a mix of **D** and **L** phenotypes. Their conclusions were, that in the resultant F1 interspecific hybrids, the characters of leaf pubescence, presence of stipitate-glands on leaf surface and on pedicels, and epicuticular wax sculptures, *are inherited maternally*, while characters such as the orifice diameter of the hip disc, together with sepal disposition and persistence on maturing hips, *are inherited paternally*. Commenting on these conclusions, Bakker *et al.* (2019) stated: "The universality and absolute nature of this claim, needs to be investigated more widely, and has to be firmly established before the data are used to revise classifications." These are valid and cautionary statements, as at least *one* of the above interspecific hybrids produced by Ritz & Wissemann (2003), (i.e. *R. micrantha* x *R. rubiginosa* and its reciprocal) does *not* accord with their claims, for in the *R. micrantha* x *R. rubiginosa* cross, the sepals *recurve and fall* while the hips are still green and immature, while in the *reciprocal* cross, the

maturing hips bear *erecto-patent, tardily deciduous* sepals – results that are, in both instances, *totally contrary* to their hypothesis. Indeed, the hips of *all* of my Irish material of the cross, *R. micrantha* x *R. rubiginosa* (as noted earlier), displayed the *small* stylar orifice and *reflexed-deciduous* sepals of its *female* parent – in contradiction to the predictions of Ritz & Wissemann. Moreover, while the interspecific hybrid cross, *R. sherardii* x *R. rubiginosa* (= *R. x suberecta* (Woods) Ley) *inherits the large* stylar orifice of its parents (O’Mahony, 2018); yet, in the *triple Rosa* hybrid cross, *R. tomentosa* x *R. x suberecta* (which I added to the Irish Flora from an East Cork (**H5**) site in August 2022 – see **Plates 5a & 5b** and captions), their hybrid *retains* the small stylar orifice (c. 0.4-0.8 mm in diameter), low-domed disc, orifice diameter/disc diameter ratio, and *long, slender, subglabrous* stylar bundle of its *female* parent, *R. tomentosa*. Moreover, in this triple hybrid, the most distinctive character inherited from its *male* parent (*R. x suberecta*) *is the presence of scattered acicles on the branches below the infructescences*. These results buttress my earlier statement (O’Mahony, 2003:12) that: “In a cross between small-orificed/large-orificed species, the inherited stylar orifice size *is generally unpredictably variable* (whatever the direction of the cross) ...” Further evidence for the *inaccuracy* of Ritz & Wissemann’s (2003) overall hypothesis, is provided by a wide spectrum of other interspecific hybrids *within* sect. *Caninae*. In this respect, a typical example is the cross, *R. canina* (female) x *R. tomentosa* (male), their interspecific hybrid variously manifesting the (often abundant) minute, *resin-scented, stipitate-glands* of its *pollen* parent (*R. tomentosa*) on its leaves, leaf-rachides, sepal-pinnae, and on some pedicels, *not the eglandular* foliage of its *female* (*R. canina*) parent – once again contradicting the statements of Ritz & Wissemann (2003).

While the results of the *Rosa* molecular study of fougère-Danezan *et al.* (2015) urge for the ‘dismantlement’ of (for example) *all* subsections within *Rosa* sect. *Caninae*, they have (as noted above) *no* alternative morphological framework to offer. Moreover, their suggestion that subsections *Vestitae* and *Rubigineae* are *not* natural (i.e. phylogenetic) units, is *at odds* with the critical, long-term experience and intuitive insights of generations of rhodologists, whose taxonomic work is based on *conventional morphological data* gleaned from detailed fieldwork, in conjunction with observations collated from a range of microscopic studies (i.e. leaf and stem anatomy, pollen grain studies, and micromorphological data). Currently, there appears to be *no* answer to this impasse, nor is a suitable ‘compromise’ looming on the horizon. (**Note:** This very situation was highlighted by Tryon (1952), in a paper entitled: ‘A sketch of the history of fern classification’, when commenting on “... the conflict between naturalness and utility in classification”. Tryon was referring to the fact that many pteridologists of that time period, opted to use *artificial* (but highly convenient) morphological characters as delimitation aids, in place of more natural (i.e. phylogenetic) but often technically inconvenient or cryptic characters. Of special interest and value in this regard, was his inclusion of the following prescient statement by Bower (1928: 39): “A complete artificial classification is always possible, and is indeed necessary for floristic use. A complete phyletic classification will only become possible with complete knowledge of the descent of the organisms classified. The second cannot replace the first under present conditions, owing to the imperfection of present knowledge. But it can lead to a correction and amendment of classification for floristic use, so as to make it run ever more nearly along lines of probable evolution.”)

Pragmatically, therefore, (and taking a cue from the above astute observations of Bower), ongoing recording of *Rosa* taxa worldwide, *must* currently depend on the *traditional* taxonomic method of species and interspecific hybrid diagnosis. Furthermore, it seems reasonable to conclude that, for the foreseeable future, traditional morphological taxonomy and modern-day molecular taxonomy, *have quite different roles to play* and, consequently, are *not* ‘in competition’, as the former’s mission *is to bring order out of chaos* in the genus *Rosa*, by categorising, delimiting, identifying, and naming subgenera, sections, subsections, species-groups, species and interspecific hybrids (as stated earlier in this paper). By contrast, the latter’s role *is predominantly the elucidation* of the (highly convoluted and cryptic) *phylogeny* of the genus *Rosa* – in some ways, a far more esoteric and formidable challenge!

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Interesting plants in Tyrone (H36), mostly 2021-2022

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Potentilla intermedia (Russian Cinquefoil)

One plant of this species turned up in the former railway yard in Cookstown in June 2021. The yard is now used for Council storage, skip site etc. and has proved a good site for unusual plants over the years. ID was confirmed by National Botanic Gardens, Dublin. As far as can be ascertained, there is just one previous Irish record, from the Dublin area away back in the 19th century.

It is an attractive plant. The flowers and leaves closely resemble those of *Potentilla erecta* (Tormentil), but it is an erect plant, about a foot tall, and this habit gives it a neat appearance.

Where could it have come from? Here is one possibility. A new dual-carriageway road between Toome and Randalstown (in Co. Antrim) has opened in recent years. At one point, a roadside bank has been sown out with, presumably, what were deemed to be ‘wild’ flowers. There is definitely *Anthyllis vulneraria* (Kidney Vetch), but also a yellow-flowered plant that looks like *Potentilla intermedia*. Unfortunately the road has no hard shoulder, and it is much too risky to stop on the carriageway, so I can’t get close to the plant. Could a passing vehicle have picked up a seed and carried it to Cookstown?

The Cookstown plant seemed to be bearing viable seed in 2021, but there was no sign of any progeny in 2022.

Bromus secalinus (Rye Brome)

Found by my son Andrew McNeill at Grange, just S of Cookstown, in July 2021. It was growing around the perimeter of a cereal field. Just one previous record for Tyrone: 1896, near Strabane, Matilda Knowles.

Rubus chamaemorus (Cloudberry)

In June 2021, Matthew Jebb and Noeleen Smyth, from the National Botanic Gardens in Dublin, re-visited the cloudberry site in the Sperrin Mountains, accompanied by Abigail Kilgore from NIEA in Northern Ireland. I had gone with Matthew and Noeleen in 2020, and had found the plant doing pretty well. However, in 2021 there was a major development. Flowers were found! They had just gone over, but flowers none the less. When the plant was first discovered in Tyrone in 1826, flowers were present, but never reported again during the whole period from 1826 to 2022. In those 200 years the plants were visited very rarely, and often too late in the year, so flowers were probably missed. But great to see them once again.

Spiranthes romanzoffiana (Irish Lady’s-tresses)

Our association with this elusive orchid in 2022 reads like a McNeill family saga. I have to start outside Tyrone. On holiday near the north coast of Co. Antrim, we visited a known site near the Giant’s Causeway, where we found around 10 flowering spikes. Our party consisted of myself, sons David and Andrew, and, most importantly, Andrew’s younger son, Samuel, aged 11. That was on Aug 10th.

On Aug 18th, based back home in Cookstown, several McNeills (but not me) took a morning walk at Lough Fea, a picturesque lake roughly 9km NW of home, with a good path encircling the lake. The lake acts as a reservoir supplying water to the local area. The drought of July and August had resulted in a considerable lowering of the lake level. A foreshore of firm mud and pebbles had developed. The McNeill party went down on to this ground. Almost immediately Samuel cried out, ‘There’s the Irish Lady’s-tresses!’ They arrived back in Cookstown in triumph, bearing photos of their find (see back cover).

Later that day, we went down to Brookend, the last refuge for *Spiranthes romanzoffiana* by Lough Neagh – but last reported from there in 2012 or 2013. We searched thoroughly but ‘no show’.

Finally, I had heard that the orchid had not appeared in 2022 at Killycorran Lough, where Claire Barnett had found it in 2019, first record in Tyrone away from Lough Neagh. Although maybe too late, I headed down there on Sept 1st, only to find the meadow had been mowed two days earlier!

Lough Fea would appear to be the only reported Tyrone site for the orchid in 2022.

Thalictrum flavum (Common Meadow-rue)

On Aug 18th, after visiting Brookend, we went a couple of miles southwards to Killycolpy, in similar Lough Neagh fenland, to follow up a report from Ian Rippey of a *Thalictrum flavum* site. Ian had given us a 10-figure grid reference. Without that, we would not have had a chance, but, with it, we walked straight to the spot. We found a healthy colony, occupying roughly a 3m x 3m square. We found another few plants about 100m distant.

Thalictrum flavum (Common Meadow-rue) had quite a history of sites from Lough Neagh in the past, but had not been reported from the Lough Neagh shorelands since 1985. Prior to 2022, the only Tyrone site known in this century was at Tamnamore, an excellent fenland site 7km E of Dungannon and 7km from the nearest point on Lough Neagh.

Drabella muralis (Wall Whitlowgrass)

In early March 2022 *Drabella muralis* (Wall Whitlowgrass) turned up in my garden. This was the first record in the Cookstown hectad, H87. I let it grow on and it grew and grew, to 40cm tall and produced abundant seed. Will I have a plague of it in 2023?

Then, in April 2022, I was in Ballynahatty townland, about 4km S of Omagh. At an abandoned farmhouse there I noticed the former farmyard was white with a cruciferous type of plant. I presumed it to be *Cardamine flexuosa* (Wavy Bitter-cress) but a closer inspection showed it was nearly all *Drabella muralis*. Hundreds of plants.

In the March 2021 edition of IBN, I reported John Faulkner's find of an appreciable colony of *D. muralis* at Gortin Glen Forest Park, a popular venue for Omagh folk. I asked the owner of the farmyard if they had visited the Forest Park recently. 'O yes', he said. 'Very often'.

Finally, I wish to report briefly three important Tyrone records that I found when trawling through some county records on DDb.

Stellaria palustris (Marsh Stitchwort)

Found by B. Goldsmith and S. Goodrich at Round Lough, Fivemiletown in 2014. They were involved in survey work at a few lakes in the area, working for ENSIS (ecological consultancy). This is the first record for Co. Tyrone. It occurs occasionally around Lough Erne, in Fermanagh, only a few km away from Fivemiletown. The recorders may not have realised its importance to Tyrone and made no comment on the record.

Trichomanes speciosum (Killarney Fern)

In 2008 Robert Northridge found the gametophyte of this fern in Altadavan Glen, about 6km ESE of Clogher. In 2019, Rory Hodd visited the site and found the sporophyte, very small and immature, but definitely sporophyte material. The only previous sporophyte material in Tyrone was from a 'small glen within 5 miles of Strabane' in 1891, recorder G. Delap.

Rhamnus cathartica (Buckthorn)

Recorded by Dave Riley in 2019 at Lough Envagh, about 12km NW of Omagh. Only one previous Tyrone record: 1 mile W of R. Blackwater, Templeton, c. 1800. Templeton's location is vague, and later botanists did not know where to follow it up.

Irish Botanical News: a short history

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In 2022, *BSBI News* was 50 years old; to celebrate this milestone in publishing, it carried two papers that charted the history of the newsletter (Lovatt, 2022a, 2022b). It was felt appropriate by the Editors (past and present) of *Irish Botanical News* that the time was right to record a similar history of this publication. As far as I am aware, the late Clive Lovatt had no direct involvement with the editing or production of *BSBI News* and so his account was descriptive and objective. My involvement with *Irish Botanical News* has been very personal and so this account of its history will be more anecdotal and subjective but nevertheless, I hope, of interest to readers. I have largely relied on my (failing) memory and recollections in putting this history together. I have little documentary evidence – three office moves, three house moves and a country move have seen to that – though I am sure there may be memos, reports, committee minutes, etc. that are relevant out there in people’s archives. If you think I have mis-remembered or, indeed, can add to this account, I am sure the Editor would be only too pleased to receive information for future publication.

How did it all start?

The first issue of *Irish Botanical News* was published in February, 1991 but the idea was formulated some years before. In the mid-1980s, I received a letter inviting me to join the group responsible for editing and producing the journal *Watsonia* as an editor. A little bit of history is necessary here for younger readers or newer members of our Society. *Watsonia*, started in January 1949, was the prestigious scientific journal of the Botanical Society of the British Isles (as it then was) responsible for publishing largely investigative scientific papers on the flora of Britain and Ireland. These were either long accounts or relatively short papers (“Short Notes”). Additionally, at the time, the journal also covered Plant Records, Book Reviews, Obituaries and Reports of Field Meetings. *BSBI News* itself had started off life in January 1972 and was an eclectic mix of material; Lovatt (2022b) outlines what *BSBI News* should be and I will refer to this later. As I settled into the role of a *Watsonia* editor, I came into contact with a very wide range of Society members at conferences and various committee meetings and it was at one of the latter that I happened to have coffee with a fellow editor. We were talking of the relationship between *Watsonia* and *BSBI News* and he said, “... and don’t forget the *Welsh Bulletin* and the *Scottish Newsletter*”. To my shame, I had never heard of either of them and so set about obtaining some back issues and subscribing to both. The *Welsh Bulletin* was the oldest and is published once or twice a year, the first issue being published in January, 1964, with the *Scottish Newsletter* starting in Spring, 1979 and is published once a year.

They were a revelation! Tightly focussed on the flora of their respective countries they were readable, chatty and full of relevant material; it was almost as if they represented a society within a society. As I thought about it, I realised there are many parallels between Wales, Scotland and Ireland with regard to botanists. All three countries have two major cities and these are geographically quite close; those cities are also at the ‘edge’ of their

respective countries and many botanists would be based there. The large hinterlands of all three countries are, generally speaking, sparsely populated and the number of botanists low. (Here, I am pre-empting a ‘united Ireland’!)

It then occurred to me that Ireland was missing out in not having such a publication and so whenever I got the opportunity at meetings in Ireland, when on the telephone to other Society members or when corresponding, I would drop gentle hints about the proposal to start an Irish newsletter. The reception I got was very mixed. These are not direct quotes but summarise the points ... “The Irish membership wouldn’t be interested.”, “Who would run it?”, “It would be a nightmare to organise.”, “Where’s the money coming from?”, “Worth a punt!”. It was comments like that last one that encouraged me to go further and so, at the AGM of the Irish Branch of BSBI in 1989, under any other business, I raised the idea of an Irish newsletter. Most had not heard of the *Welsh Bulletin* and *Scottish Newsletter*. The discussion was lively and covered much of the same ground as the points outlined above but there was a general and enthusiastic agreement that it was worth pursuing if I was prepared to take it on. The Committee for Ireland agreed with the feelings of the AGM and I set about the task.

Initially I needed two things, finance and copy. In those days, the BSBI was not the comparatively affluent society it is today. I may be wrong but at the time the Society did not have any paid staff, all the work being done on a purely voluntary basis. This meant that money was tight and a new venture had to make its case against competing, existing drains on the Society’s resources. Luckily, the gentleman in charge of finances was the Honorary Treasurer, Mike Walpole. I use the term “gentleman” because that is exactly what he was; he was enthusiastic about the enterprise and on production of a summary of estimated accounts he found the money for the first issue. He continued to support the publication over successive years and for that we should be grateful. Copy was more of a problem. I set about contacting Irish members about the proposal to publish a newsletter and what sort of material I was hoping to include. I also made personal contact with as many possible contributors as I could think of. I also elicited possible names for the new publication.

I had a vision of what the newsletter should be and it probably corresponded with the points made in *BSBI News* by David McClintock, its first editor, in its very first issue (McClintock, 1972):

“ ... the information in the Newsletters [sic] will not be ephemeral”;

“The precise contents will depend in large on the wishes and contributions of members.”;

“ ... news of people, when they join, when they move, get new jobs, marry, breed, get ill or well, go to interesting places, what they discover or think or see”;

“ ... letters and questions to answer ... shorter notes of all sorts”; and

“Members should feel that here is a place where they can see their contributions quickly in print, voice opinions and be in contact with what is going on.”

And so I sat back and waited ...

The first issue of *Irish Botanical News*, February, 1991

My attempts to get copy for the first issue resulted in a number of vice-county reports (five in all). There was also a lovely, whimsical piece from Helen Megaw on how she became a

botanist (Megaw, 1991), and papers on aliens (Reynolds, 1991) and *Trollius europaeus* (Globe-flower) and *Prunus padus* (Bird Cherry) (Sheppard, 1991) as well as reports of the Irish Recorders' Meeting. There was also a letter and smaller items. To bulk out the first issue I included a list of vice-county recorders and their addresses. At Irish AGMs there were always interesting talks and I felt that with the relatively poor attendance many members were missing out on hearing some important work. I therefore asked the two main presenters at the 1990 AGM to prepare their papers for publication in the first issue and so we also had a fascinating view of the future role of the BSBI from Gwynn Ellis (Ellis, 1991) and the future role of the BSBI in Ireland (Phillips, 1991).

This material came to me as either hand-written or typed, the majority from typewriters with ageing ribbons! As a small amount of editing was necessary, including bringing the submissions into line with the house-style, it was essential that all the material had to be typed or re-typed. There was no monetary allocation for this so I had to do that myself using the word-processing package WordPerfect on an Apple IIc microcomputer. The house-style I adopted was that from *Watsonia*, which I was familiar with.

At the time, I was a seven-fingered typist having had no formal training on how to touch-type. I had learned to type for a botanical project about seven years earlier on John Harron's *Flora of Lough Neagh* (Harron, 1986). Miss M.P.H. Kertland, based in Queen's University, Belfast, encouraged many amateur and young botanists to write up their work; one of her 'botanists' was John Harron who had been collecting records on the flora in and around Lough Neagh, Northern Ireland for some years. She encouraged him to write up the work as a Flora and the typescript was handed to the committee responsible for publishing the *Irish Naturalists' Journal* to edit the work, find the finances and organise the publication. I think it had been with the Committee for some time and as a 'new boy' on the Committee, I was tasked with this responsibility! The typescript was of very poor quality and needed to be completely edited and re-typed and stored digitally so that printing could be effected from 'camera-ready-copy'. There was no money for re-typing ... and so I set about the task as a one-fingered typist using a BBC Micro-computer with the Wordwise word-processing package, and an Epsom dot-matrix printer and a cassette tape for storing files! After 238 pages my one-fingered typing had morphed into a comparatively fast seven-fingered version.

The type-script for *Irish Botanical News* had to be formatted for printing, what was known in the new jargon of the time as producing 'camera-ready-copy'. I had just completed a four-hour course on a DTP (Desk-Top-Publishing) package, Aldus PageMaker. Wordwise and other word-processing packages at the time had few capabilities when it came to organising the text on the page. (Early versions of Wordwise were not even WYSIWYG, What You See Is What You Get, and, for example, to change font size or font type entailed embedding printing characters into the text.) To do this layout work, I used Aldus PageMaker. In those days, micro-computers were only just beginning to be used in university departments and expensive software programmes such as PageMaker were usually installed on just one machine. In my case, that machine just happened to be the one in my Head of School's office. I am not sure he ever used the package and the rumour was that he did not even know how to switch on the computer itself! I thought it should have been a quick job to 'pour' the text into PageMaker, format it and print it. But, it is one thing to do a course with a tutor standing there to help when needed and another to set about a

task without that support. Needless-to-say, it did not go smoothly ... I lost text, new pages mysteriously appeared, what printed differed from what was on the screen ... you get the picture! Two days later and I did get something that was acceptable. I should say as an aside that I must have got significantly better as in Number 3 of *Irish Botanical News* I was extolling the virtues of DTP (Rushton, 1993).

The front cover posed a problem. The membership had not come up with any “particularly inspiring” titles for the newsletter and so the Committee for Ireland went with my working title of *Irish Botanical News*. The cover also needed an illustration and Joan Crichton came to my rescue by providing a delightful, simple sketch of three botanists clustered around a fern and drawn from a joint meeting of the Fern Society and the BSBI at Peakadaw on the south side of Glenade, Co. Leitrim (see Page 45). It was also decided to go with light green covers, the same colour being used through to Number 19. Printing was thus done from camera-ready-copy and was problem-free. Gwynn Ellis, the Membership Secretary, provided address labels and attaching them and stamps and stuffing the envelopes with the newsletter and a few separate pages was undertaken by me ... and my seven-year old son. He was the cheapest labour I could find! It was with some relief that I remember walking to the University Post Office one February morning with three sacks, mail for the UK, mail for Ireland and a very small sack for ‘overseas’ mailings.

The following years

Publication settled into a routine. I had deliberately chosen February (later March) as the publication month for two reasons. I viewed it as the end of one botanical year and the start of another. Winters were for catching up, adding records, checking herbarium specimens, writing up notes, even preparing articles for publication in *Irish Botanical News*, etc. whilst the planning for the coming spring and summer was taking place about this time also. The period running up to February also coincided with a comparatively slack period in my busy teaching schedule so I could fit the work in more easily.

By the time I came to prepare Number 3 (1993), I had acquired access to a document scanner and OCR (Optical Character Recognition) software and thus, theoretically, I could scan any incoming typed copy and then using the OCR package convert the scanned image to a word-processing document. Unfortunately, the quality of the typescript of many of the articles submitted was very poor leading to a final OCR-ed document that contained many errors that meant very carefully proof-reading. Sometimes I wondered whether it might not be easier and less stressful to simply retype the work but eventually the quality of submissions did improve and made for an easier time. Eventually I gave up using DTP to produce the camera-ready-copy as modern word-processing packages such as Word gave full control over how the text would appear on the page; Apple computers also gave way to IBM-compatible PCs in my life.

But, things were not always straight-forward and I had two disasters to deal with. The printing was done by a BSBI nominated printer and I always used the same one and the same set of printing instructions were sent along with the copy. However, when I received the copies of Number 6 (1996) something had gone seriously wrong. The page size was correct (A5) but the main text had been shrunk so it only filled about two-thirds of the page. It was still readable, but only just! I complained to the printer but was told that a re-print would be charged at the full price leaving me no alternative but to send out the copies with

a note of apology. The fact that I did not get any complaints shows how understanding the Irish members are! It was unfortunate that it should affect this particular issue since there was a rather useful map of West Cork showing the 51 Natural Heritage Areas but the town labels were a challenge to read (O'Donnell, 1996). Luckily the dot-distribution maps of Forbes & Northridge (1996) fared better.

In 2001, as issue Number 11 was going to press, I got the news that the printer, based in England, had gone out of business. I was left to try to find an alternative printer and I thought a local one might be preferable. I got quotes from printers in Belfast, Dublin and elsewhere in Ireland and was shocked at the prices being quoted. I think the cheapest was five times what I had been paying and one quote was ten times. Knowing that the BSBI coffers would not stand such a 'hit' I decided to print the copies myself, using a photocopier. Luckily, the chief technician in the university school where I worked, Mrs Shirley Morrow, was sympathetic to my plight and allowed me to use the faculty photocopier. Staff were allowed to do private photocopying but were charged the same rate as 'outside'; Shirley charged me the rate as if the work was part of my job, a considerable reduction! Over the years, this saved BSBI hundreds of pounds. The down-side was the time to print. Photocopiers were fairly slow in those days and each sheet had to be printed double-sided which added to the time. Additionally, it was not possible to tie-up the faculty photocopier for a long period during the day and so it became an overnight job. I would start about 8.00pm and the copying itself took about five hours. I then set the stacks of pages around a bench in the middle of a student laboratory and walking round the bench I 'picked' the pages for each copy. A long-reach stapler completed the job, which usually finished about 3am.

This did have one advantage. Photocopiers were notoriously fickle machines and paper-jams were common every few dozen pages or so. I became very adept at being able to strip down a photocopier to clear paper-jams so much so the office staff frequently called on my newly-learned skill! I could also change the toner without spilling any excess on the photocopier room carpet!

In my time as Editor, I never refused publication of any submission; everything submitted was published. However, in a significant number of cases I did have to do an extensive amount of editing and re-writing to bring the text up to a standard where it told a logical story without repetition sometimes rewriting the whole submission. I enjoyed this part of the job as it meant that work that would otherwise not see the 'light of day' was made available to a wider audience; it also meant that a firm bond started to establish between authors and the Editor thus encouraging further submissions and perhaps, by 'word of mouth', submissions from others.

Changes of Editor and changes of format

In 2007, I announced that it was time to move on and give someone else a chance to edit *Irish Botanical News*. My decision was rather made for me as recently I had had a promotion and the extra work-load meant that I did not have the spare time to fit in the newsletter. Paul Green jointly edited the Number 18 (2008) issue with me, jointly edited Numbers 19 (2009) and 20 (2010) with John C. Wallace and then continued through by himself for the next c. ten issues, when he relinquished duties to the current Editor, Alexis FitzGerald. Table 1 shows the full list of editors and the issues for which they were responsible.

Throughout my time as Editor, I was acutely aware of the need to keep within budget and for that reason the format changed little. The newsletter was A5 with light green covers and a Times New Roman font whose size varied depending on whether it was necessary to reduce it in size so as not to exceed the page limit. The only change was to the front cover. After the first issue, I had rather hoped that I would have a steady supply of illustrations from fellow botanists. I made a plea in my editorial in Number 2 (Rushton, 1992) for cover illustrations but none were forthcoming though I did have a coup when I was able to include on the front cover of Number 2 a drawing of *Spiranthes romanzoffiana* (Irish Lady's-tresses) made and donated by Raymond Piper. The cover illustration of Number 3 (1993) was of *Plantago coronopus* (Buck's-horn Plantain) from my own research work and that of Number 4 (1994) was of *Luzula pallidula* (now *L. pallescens*) (Fen Wood-rush) from the paper by Rich (1994). Mrs Pat McKee prepared cover illustrations for Number 10 (2000) (*Taxus baccata*, Yew), Number 11 (2001) (*Eryngium maritimum*, Sea-holly) and Number 13 (2003) (*Arbutus unedo*, Strawberry-tree) but for others I relied on using out-of-copyright illustrations from books, with suitable attribution. These were not randomly chosen but usually were illustrations of species covered in one of the main papers.

Paul Green continued this trend for Number 19 (2009) but there was a major change for Number 20 (2010) in that he introduced, on his own initiative, colour photographs on the front and back covers; the covers also had a white background instead of light green. (Printing was also undertaken professionally rather than the cottage-industry I had established; eventually, when printing was undertaken in Ireland it turned out to be much cheaper than using a printer in the UK!) Number 21 (2011) showed another major change to a stiff cover with front and back covers having colour illustrations and two pages of colour inside. Number 23 (2013) had front and back covers and both inside covers with colour illustrations and also four pages of colour plates in the centre pages. Finally, in Number 31 (2021) the coloured plates in the centre had increased to eight pages. Green had also introduced black and white photographs embedded within the text. The introduction of colour was mirrored in the other two newsletters with the *Welsh Bulletin* introducing colour in the January issue of 2010 and the *Scottish Newsletter* a little later in 2014. Clearly there was a re-think on the financing of these regional newsletters and money was found for the extra expenditure.

All issues have been stapled, not glued, though in recent years the large number of pages have resulted in a square binding but it is still stapled.

All issues of *Irish Botanical News* are on the BSBI website except Numbers 1 (1991) and 2 (1992) and those should be posted there shortly.

***Irish Botanical News*, the statistics**

There have been 32 issues of *Irish Botanical News* to date. The total number of pages published is 1,841. It is not easy to produce an accurate figure for the number of words published given the differences in font size, number of headers and sub-headers, etc. but a conservative number would be approximately just short of 1,000,000 words! One hundred and forty-eight artists and authors have contributed at least one illustration or article and there have been approximately 695 submissions.

When looking at the publication statistics, one thing is very clear and that is the general increase in the number of pages published in each issue over time (Figure 1), though

this increase is not linear. Some anomalies might be expected in datasets such as these, for example a ‘push’ to publish material in the run up to a national project like *Atlas 2020*. Throughout my editorship, the number of pages remained fairly constant except for a dip for Number 4 (1994) and Number 5 (1995); it was at that point that I feared for the future of the newsletter! After I handed over editing to Paul Green, there was an increase more or less year-on-year until it reached just over an average of 82 pages per issue. Examination of the statistics for each issue reveals that this increase was due largely to an increase in the number of articles rather than in articles becoming longer (Table 2). For Table 2, I have divided the issues up into three date classes, the first (Numbers 1-18, 1991-2008) being when I was Editor, the second (Numbers 19-25, 2009-2015) when there appeared to be a steady increase in the number of pages per issue, and the third (Numbers 26-32, 2016-2022) where the number of pages appears to be levelling off (Figure 1). As is clear, despite the increasing number of pages and number of articles the mean article size has remained stable (2.7 pages, 2.5 pages, 2.8 pages per contribution for the three date classes respectively). Further, the increase in the number of articles seems to be associated with an increase in the number of field meeting reports (0.7, 2.9, 4.3 articles per issue for the three date classes respectively) and also articles focussing on individual taxa (2.4, 3.3, 7.9 articles per issue for the three date classes respectively). I am pleased with this latter increase as I believe it is one area where any botanist regardless of expertise can make meaningful observations, measurements, comparisons, etc. In these latter issues there has also been an increase in the number of new vice-county recorder profiles, a move which is also to be welcomed.

In summarising the statistics for each issue for this paper, I ended up with 21 categories of submitted material; the most common submissions are shown in Table 3. Other categories such as minutes of meetings, book reviews, obituaries, notices, editorials, etc. made up the rest. Based on these, an average issue would be a well-balanced newsletter.

In all, there have been 134 vice-county reports (or articles reporting on surveys of a specific vice-county), roughly four per issue and that must represent signs of a healthy recorder network. However, the submission of reports has been very patchy and no reports have been received for just over half of the vice-counties. That does not mean there has been no activity in those vice-counties and there may well have been field meetings, etc. taking place but it would be useful to know what activity has been occurring so that fellow botanists could help if necessary.

As indicated above, 148 people have contributed material for publication in *Irish Botanical News* and whilst many of those have only submitted one piece a number of other contributors have multiple contributions to their name. I do not wish to produce a list of these here but two authors have supported the work of the newsletter since its inception and their special contribution should be recognised. Tony O’Mahony has contributed 47 articles, many of them vice-county reports but also a significant number on his beloved *Rosa* taxa and other taxa-related papers. Sylvia Reynolds has similarly supported the newsletter with 33 contributions, her alien-love being to the fore! One thing I have noticed is the lack of many fellow ‘professional’ botanists writing for the newsletter and I cannot really explain this other than to think that publication of material in more ‘prestigious’ journals is of greater importance to them. With the increased size of the publication and its better ‘look’ maybe that will change. It was gratifying to see the first results from the Irish Species

Project appearing in Number 27 (2017) (Long *et al.*, 2017); let us hope it is the first project of many.

Table 1. Editors of *Irish Botanical News*, 1991 to date.

Editor	Issue Numbers	Dates of publication
Brian S. Rushton	1- 17	February 1991 – March 2007
Brian S. Rushton and Paul R. Green	18	March 2008
Paul R. Green and John C. Wallace	19-20	April 2009 – March 2010
Paul R. Green	21-30	February 2011 – March 2020
Paul R. Green and Alexis FitzGerald	31	March 2021
Alexis FitzGerald	32 to present	March 2022 – present

Table 2. Changes in articles published in *Irish Botanical News* in three date classes (Numbers 1-18, 1991-2008; Numbers 19-25, 2009-2015; Numbers 26-32, 2016-2022).

	Numbers 1-18	Numbers 19-25	Numbers 26-32
Mean number of pages per issue	46.3	61.4	82.4
Mean number of articles* per issue	17.6	25.0	29.1
Mean number of pages for articles (pages/articles) per issue	2.7	2.5	2.8
Mean number of field meeting reports per issue	0.7	2.9	4.3
Mean number of articles focussing on a botanical taxa or group of taxa per issue	2.4	3.3	7.9

* This includes all contributions to the newsletter, not just scientific papers.

Table 3. The number of articles published in *Irish Botanical News* (Numbers 1-32, 1991-date) in the five most common categories of articles.

Category of article	Number of articles published
Vice-county reports	134
Articles with a focus on a botanical taxa or group of taxa	121
Articles of a general botanical nature	66
Field meeting reports	62
Articles with a focus on aspects of a site or geographical area	46

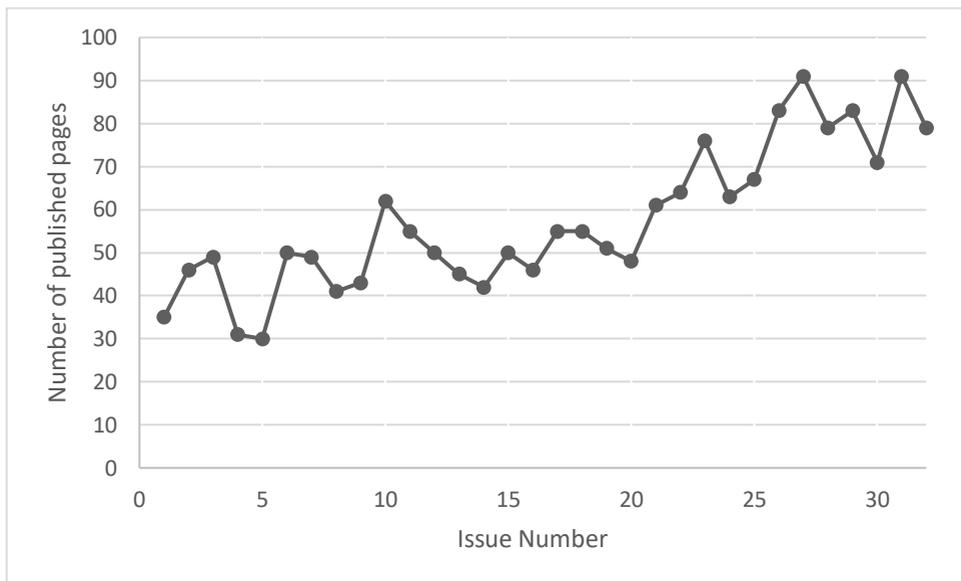


Figure 1. The number of published pages in the 32 issues of *Irish Botanical News*, starting with Number 1 (1991) to Number 32 (2022).

In conclusion

Above, I referred to David McClintock’s vision for *BSBI News* (McClintock, 1972), a vision which I shared for *Irish Botanical News* all those years ago. By-and-large, I think we have got there without having to record too many births (“breed”) or health scares! One area where I think we could improve is in submitting short snippets of information. Maura Scannell was good at doing this (e.g. Scannell, 1992) and sometimes would deluge me with very short notes of botanical information, not particularly intended for publication but simply because she thought they were interesting and/or fun. We all come across such ‘snippets’ in magazines, newspapers, websites, etc. and it would be nice to see some of these published in *Irish Botanical News*; if nothing else, they make good page fillers!

However, we must not become too complacent. In 2017, BSBI wanted to merge the country journals into *BSBI News*; there was such a backlash from Irish and Welsh members that BSBI gave up the idea!

Putting together this paper has brought home to me how far we have come in the last 30+ years. The impact of having our own dedicated Irish Officer is plain to see in more recent issues of *Irish Botanical News* as more work is being reported and by a wider range of people. The ‘old-guard’ are now passing the baton of Irish botany on to the younger folk and I think it, and *Irish Botanical News*, are in good hands. I look forward to reading about *Irish Botanical News* when it reaches its 50th birthday in 2040 ... when I will be 93!

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A first record of *Senecio minimus* (Toothed Fireweed) from an urban centre in Co. Dublin (H21), and its associated ruderal flora

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FitzGerald (2018) first noted the occurrence of the neophyte *Senecio minimus* Poir. (syn. *Erechtites minima* (Poir.) DC.) (Toothed Fireweed) as a weed in a garden border on Coliemore Road, Dalkey, south Co. Dublin (**H21**) on 9th August 2017. FitzGerald (2019) subsequently recorded (and mapped) the species in abundance across a wide swathe of the Killiney/Dalkey localities. This species is native to New Zealand, Australia and Tasmania (Webb *et al.*, 1988). Noted in Britain as a rare casual wool alien in previous decades (Stace 2019), these newly emerging populations are more likely to have arrived via seed contamination with imported garden plants (pers. obs., 2017-2022). FitzGerald (2018, 2019) surmised that these new populations were likely to spread and naturalise more vigorously than previous casual wool alien populations.

Indeed, FitzGerald (2021) subsequently reported the species from a roadside by an abandoned industrial area in Sandyford, c. 8 km west of Dalkey/Killiney. Botanical Society

of Britain and Ireland (2022) also holds a record of the species from the Glasthule area from 2018, immediately west of Dalkey/Killiney. Clearly, this species is actively spreading in south-east Co. Dublin, if somewhat slowly.

Furthermore, Botanical Society of Britain and Ireland (2022) holds three additional Irish records of the species from the south-east of Ireland, west of Waterford City in Co. Waterford (**H6**). There are also a handful of records in Britain from Llyn Peninsula in Wales (one population), the Isle of Wight (one population) and the Scilly Isles (multiple populations). FitzGerald (2021) hypothesised that the Welsh population could have originated from wind-born seed from the more extensive Dublin populations, although this is uncertain. The species was noted in the Welsh site from “*neglected flower troughs*”, so it may well have been an imported contaminant with garden plants, as was the likely origin of the Dublin populations. This species has the potential to spread elsewhere in Ireland and Britain and may still be under-recorded and/or over-looked for superficially similar-looking species occupying a similar niche, including *Erigeron* (formerly *Conyza*) species.

The present article notes the first record of *Senecio minimus* from an urban centre in Ireland, namely, Dun Laoghaire town centre in south-east Co. Dublin (within the Dun Laoghaire-Rathdown County Council area). A single plant of this species was first noted by the author on 23rd May 2022 in a corner at the base of a juncture of two walls at the edge of a walking pathway by the entrance to Permanent TSB Bank, 11 George’s Street Upper (at Irish Grid reference O 24359.28448) (see page 84). Many ruderal species favour these wall bottom/corner locations for growth, as nutrients from the surroundings naturally accumulate along these marginal areas from wind and rainwater (also supplemented by nutrients from walking dogs!) and there is a superior element of protection from trampling in these places also. *Senecio minimus* is likely becoming increasingly well-established in ruderal habitats in the wider south-east Co. Dublin area, including the bases of walls/fences, path edges, wall tops, roadsides, open gravelly ground, garden borders, and even rock outcrops (FitzGerald, 2019). The recording of this population is yet another sign of the potential of the species to spread further in Dublin and beyond, especially as it appears to favour our increasingly warmer climate conditions in recent years.

Upon discovering this pioneer population of *Senecio minimus*, the fate of the plant was observed over the early summer period from May to June 2022. The surrounding area was recorded to attempt to locate further *Senecio minimus* plants and to gain some context on the surrounding urban flora. A variety of other ruderal plant species were noted during this period on road- and path-sides, walls, gutters and other ruderal locations in the immediate vicinity of the *Senecio minimus* population in Dun Laoghaire town centre. The streets and lanes which were recorded along were: Upper Georges Street (west end), Mulgrave Street (and an unnamed residential lane immediately east of this street), Cantwell Lane (and West Lane perpendicular to it), Patrick Street (north end), Lynch Lane, East Lane, Marine Road (south end), Northumberland Avenue (north end), Haigh Terrace, Lee’s Lane, Sussex Street, Eblana Avenue, and the immediate surroundings of St. Michael’s Church and the Royal Marine Hotel (most of the relevant street names can be seen in the following link: <https://localwiki.org/dl/map/tags/street#zoom=18&lat=53.29145&lon=-6.13589&layers=BTT>).

On 23rd May 2022, the following 51 ruderal vascular plant species were recorded (native species in bold type, non-native (including archaeophyte) species in plain type):

<i>Parietaria judaica</i>	<i>Senecio vulgaris</i>	<i>Poa annua</i>	<i>Buddleia davidii</i>	<i>Centranthus ruber</i>	<i>Stellaria media</i>
<i>Lapsana communis</i>	<i>Jacobaea vulgaris</i>	<i>Hypericum hircinum</i>	<i>Taraxacum</i> agg.	<i>Geranium robertianum</i>	<i>Valerianella carinata</i>
<i>Cardamine hirsuta</i>	<i>Sagina procumbens</i>	<i>Conyza</i> cf. <i>floribunda</i>	<i>Sonchus oleraceus</i>	<i>Catapodium rigidum</i> var. <i>major</i> and var. <i>rigidum</i>	<i>Polypogon viridis</i>
<i>Soleirolia soleirolii</i>	<i>Asplenium ruta-muraria</i>	<i>Plantago major</i>	<i>Matricaria discoidea</i>	<i>Epilobium obscurum</i>	<i>Epilobium ciliatum</i>
<i>Epilobium parviflorum</i>	<i>Urtica urens</i>	<i>Capsella bursa-pastoris</i>	<i>Rumex crispus</i>	<i>Verbena officinalis</i>	<i>Asplenium scolopendrium</i>
<i>Asplenium trichomanes</i> subsp. <i>quadrivalens</i>	<i>Poa trivialis</i>	<i>Acer pseudoplatanus</i>	<i>Antirrhinum majus</i>	<i>Sisymbrium officinale</i>	<i>Hedera helix</i> agg.
<i>Erigeron karvinskianus</i>	<i>Mercurialis annua</i>	<i>Geum urbanum</i>	<i>Anisantha sterilis</i>	<i>Campanula poscharskyana</i>	<i>Mycelis muralis</i>
<i>Myosotis discolor</i>	<i>Cymbalaria muralis</i>	<i>Papaver rhoeas</i>	<i>Crepis capillaris</i>	<i>Veronica persica</i>	<i>Veronica filiformis</i>
<i>Dipsacus fullonum</i>	<i>Euphorbia peplus</i>	<i>Aquilegia vulgaris</i> (garden escape)			

On 1st June 2022, the following additional 12 ruderal vascular plant species were recorded (native species in bold type, non-native (including archaeophyte) species in plain type):

<i>Epilobium montanum</i>	<i>Oxalis incarnata</i>	<i>Papaver dubium</i>
<i>Viola</i> × <i>wittrockiana</i>	<i>Tanacetum parthenium</i>	<i>Myosotis arvensis</i>
<i>Lepidium didymum</i>	<i>Polygonum aviculare</i> s.s.	<i>Geranium dissectum</i>
<i>Euphorbia</i> sp. (garden escape)	<i>Fraxinus excelsior</i>	<i>Oxalis articulata</i>

Urtica urens is a species of particular interest, which was recorded in and around the herbaceous borders and built ground directly adjacent to St. Michael's Church. This species is an archaeophyte-denizen (Stace, 2019) formerly more common in Ireland in areas of arable agriculture, now an occasional species in Co. Dublin (Doogue *et al.*, 1998). The neophyte *Verbena officinalis* was also found in this same area, having self-sown from planted populations in the same herbaceous borders.

By 30th June 2022, the single *Senecio minimus* plant had been removed (perhaps due to bank employees noticing an inquisitive stranger photographing and studying the plant so often!). It should be noted that no other *Senecio minimus* populations were found in the area during the surveys, despite widespread searches, indicating that this was likely a stray pioneer population, probably widespread searches, indicating that this was likely a stray pioneer population, probably originating from the larger, well-established populations in Dalkey/Killiney. This species should be better known to Irish (and British) botanists, particularly those in eastern and southern Ireland, as it may well appear before their eyes in short order.

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Antrim's rare plants – Part 3

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In Part 1 of this series of articles, I highlighted 40 species which have not been seen in County Antrim (**H39**) since 2000. The rest of the series concerns the approximately 90 other species which have been seen in no more than 3 sites in the county since 2000 (excluding neophytes and some taxonomically difficult species). Part 2 covered the rare plants of Antrim's mountains and glens. In Part 3, we turn to Antrim's famous coast.

The Antrim coast road from Larne northwards offers the traveller some of the most spectacular scenery to be found anywhere in Ireland. Tourist attractions such as the Giant's Causeway and the Carrick-a-Rede rope bridge bring enormous numbers of visitors but everywhere there are beautiful places to explore. The Islandmagee peninsula has both dramatic cliffs and atmospheric saltmarsh. The coast of Rathlin Island is just a perfect combination of chalk and basalt cliffs and quiet bays.

Cliffs and Rocky Shores

Because the Antrim coastline is studded with cliffs, the species which grow on them are not particularly rare in the county. An exception is *Crithmum maritimum* which is known from only 2 sites. It grows high on the cliffs at the SW corner of Rathlin (where first discovered in 1991) and on low coastal rocks just south of Garron Harbour (where first discovered in 1903).

It is worth mentioning that a prostrate form of *Cytisus scoparius* (believed to be subspecies *maritimus*) is found in some quantity on Rathlin and nowhere else in the county. The best displays are on the NW cliffs in May. Another plant with a Rathlin connection is *Crambe maritima*. This species was recorded by John Templeton from Church Bay on Rathlin in 1794 but was not subsequently seen anywhere in the county until 2009 when it was found south of Garron Harbour. Over the next decade, several new sites popped up

further south but the icing on the cake was the discovery in 2019 of a fine *Crambe* colony on chalk shingle near the SW corner of Rathlin – back after 225 years. Or maybe it never left?

Antrim has two extant populations of *Mertensia maritima*. There is a strong patch next to the Giant's Causeway with a few smaller plants in the coves to the east. The other site is on Rathlin where the *Mertensia* occurs along a good length of shoreline on the southern arm of the island.

Sand Dunes and Sandy Shores

The rarest Antrim plant of sandy shores is *Salsola kali*. This was rediscovered at Whitepark Bay by Simeon Cathcart in 2019 after a gap of 66 years and at Waterfoot in 2020 after a gap of 135 years. It is still to be refound at Bushfoot where it was last recorded in 1956.

The best examples of sand dunes are on the north coast at Whitepark Bay, Bushfoot and Portrush with smaller sites at Ballycastle, Cushendun and Waterfoot. The rare plants of this habitat do not all grow at any one site and each site has its own unique character.

Thalictrum minus is thriving in one area of dunes at Bushfoot. A few plants survive beside the golf course at Ballycastle but there have been no recent sightings from its former site at Portrush. *Ononis repens* is now confined to Waterfoot where it is plentiful beside the boardwalk. It used to be more widespread with old records from Portrush, Ballycastle and Cushendun. *Calystegia soldanella* is still plentiful at Bushfoot but has disappeared from Ballycastle.

The only recent sighting of *Eryngium maritimum* was at Whitepark Bay in 2002. I have searched for it there many times without success. Whitepark Bay is also the only recent site for *Cerastium semidecandrum* (2015) but this species may possibly have been overlooked elsewhere.

Lycopsis arvensis has been recorded in recent years from both the old dunes at Bushfoot and at Whitepark Bay but hasn't been seen at Portrush since 1987. My favourite plant of sand dunes is *Vicia lathyroides* which has old records at Portrush (1988) and Ballycastle (1949) but which was discovered recently at two brand new sites – old dunes at Bushfoot (2009) and sandy ground at Waterfoot (2022).

Bushfoot is the only post-2000 site in the county for *Viola canina*. It grows in cattle-grazed grassland within the dune system. It is difficult to explain the steep decline in this species. There are many old sites on the north coast and on Rathlin where the ground should still be suitable. The former populations beside Lough Beg and Lough Neagh are more likely to have suffered from habitat loss.

Saltmarsh and Damp Shores

There are very few areas of saltmarsh in the county. The best examples are on the shore of Larne Lough which is the only place to see *Limonium humile*. The rarest of the sea-spurreys in the county is *Spergularia media* for which recent records are also confined to Larne Lough.

Parapholis strigosa was once confined to Larne Lough but was discovered on a BSBI field trip in 2018 at Dunseverick on the north coast, along with *Puccinellia distans*. The latter has also been seen recently at Carrickfergus with older records from elsewhere beside Belfast and Larne Loughs.

A recent arrival, spotted by Suzanne Belshaw, is *Atriplex portulacoides* which is only found in small quantity beside Larne Lough at Glynn (2019) and at the Whitehouse Lagoon beside Belfast Lough (2018). *Atriplex littoralis* is recorded occasionally from the shores of Belfast Lough and has 3 post-2000 records.

A very rare plant in the county is *Oenanthe lachenalii* for which the only confirmed record is at the Giant's Causeway. The plant was recorded here in 1887 by Robert Lloyd Praeger, but not seen again for exactly 100 years. It appears to be doing well with several post-2000 sightings. A few years ago, I saw *Oenanthe lachenalii* on Rathlin Island. Or so I thought. I walked past it quickly and have never returned to the same spot.

Juncus maritimus also seems to be confined to the Giant's Causeway. It was first found there by David Moore before 1837 until rediscovered by Rory Hodd on a BSBI field trip in 2018. It occurs within the same area as the *Oenanthe*. There are unconfirmed reports of the *Juncus* from Dunseverick and south of Torr Head.

There are 3 post-2000 reports of *Apium graveolens* from the Giant's Causeway, Cushendall and Glenarm. This is a plant which I have never seen in the county although it has quite a few old records mainly from the shores of Belfast and Larne Loughs. I will keep looking.

Coastal Waters

As I can't swim, I tend to avoid submerged aquatics. However, more intrepid souls know *Ruppia maritima* (last record 2009) and *Zostera marina* (last record 2006) from the sea lagoon at Glynn. The eelgrass was also recorded near Portrush in 2006 and is reported from Mill Bay on Rathlin and at Waterfoot.

In conclusion, the Antrim coast is a great place for a day out. Not too many visitors to Waterfoot kneel down to admire the tiny flowers of *Vicia lathyroides*. The crowds who flock to the Causeway stones don't usually include the beautiful *Mertensia maritima* in their holiday pics. Rathlin's *Crambe maritima* site may not be known to many humans, but last year it was discovered by the local sheep. There wasn't a single leaf left.

***Trifolium suffocatum* (Suffocated Clover) a new clover for Ireland**

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I was out and about across Co. Wexford collecting photos and samples of *Erophila* (Whitlowgrass) for a webinar workshop I was doing for BSBI in March of 2022. While at Rosslare I came across rosettes of a clover that I took to be *Trifolium ornithopodioides* (Bird's-foot Clover) on the sandy lawn of a derelict house, and on the verges around a hotel car park. I went back on 21st April and confirmed the identity of the clover when it was flowering. This being the first record from Rosslare since Robert A. Phillips reported it there in 1932.

A few days earlier, 12th March I had visited Ferrycarrig Castle, which sits on a large rocky knoll by the River Slaney. There were clover leaves, I couldn't convince myself that these were Bird's-foot Clover. They were pure green, and forming round dense patches

of many small leaves. They looked like miniature *Trifolium repens* (White Clover), but as far as I could make out, they were not sending out runners, like you would expect from White Clover. Were these clover plants small because of all the trampling they received from the visitors to the castle?

After confirming the identity of the Bird's-foot Clover on the same day I called into Ferrycarrig Castle to take another look at the clover. I looked at the patches of clover, and instantly thought are they flowering? If so, they must be Suffocated Clover, which would be a new clover to Ireland.

Down on all fours with my hand lens I started examining the plants. At the base of each clump of leaves were clusters of many extremely small flowers (see Page 42). Even with a hand lens it was hard to be sure they were actually flowering as they were so tiny. I started to count the number of plants and got to over 400 and gave up. If I hadn't seen Suffocated Clover in the UK, I may have never realised what I had been looking at as even when flowering the patches looked as though they were just made up of small green leaves.

What is the status of the Suffocated Clover? Some have suggested it is native, and others a non-native. The most plausible would be that a visitor to the castle which had arrived by ferry from Wales or mainland Europe, had brought the seeds on their shoes, or the pet dog had the seeds on its coat, and they dropped off. We will probably never know the true status of this clover in Ireland.

A new station for *Lycopodiella inundata* in Wicklow

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In 2022, whilst hillwalking in Co. Wicklow (H20), I noticed a small patch of horizontal, green stems growing on exposed peat. Their growth habit resembled a *Lycopodium* species I had seen on a botany trip in Central America led by Daniel Kelly in 2016. Some weeks later the plants, now with vertical fertile stems, were identified as *Lycopodiella inundata* (L.) Holub. (Marsh Clubmoss). The species was first recorded in Wicklow by J. P. Brunker in 1928 (Brunker, 1950) at a single site in Glendalough. Records span the two-year period to 1930 (Botanical Society of Britain and Ireland, 2022). Described by Praeger (1934) as “a rare plant”, it is listed in the Flora (Protection) Order, 2022, and is included in the Red Data List of Irish vascular plants (Wyse Jackson *et al.*, 2016). The most recent Irish records are in Counties Galway, Mayo, Waterford, and Co. Armagh in Northern Ireland (BSB, 2022). This new station is some distance from the Glendalough site; a recent search there was unsuccessful, however, water levels were high at the time so the site merits another visit.

Five patches were found initially, then a further eight with Catriona Brady, and a third search brought the total to 21 separate patches (henceforth colonies) in four distinct areas across *c.* 250m x 250m of the hillside. The location, main habitat features and associated vegetation were noted in each case. The length of the longest prostrate stems, the

number of vertical stems bearing strobili ('cones'), the height range of vertical stems and the presence or absence of sporangia were recorded. Several small groups of clubmoss stems, separate but adjacent to six of the colonies, were recorded but are not included in the analyses here.

Habitat and substrate description

The clubmosses grew at elevations of 280m to 320m on flat or gently sloping terrain except for six colonies found on inclinations of 20°-40°. All grew in unshaded or south-facing locations apart from one east-facing and two north-facing sites. The shallow peat substrate (Table 1) had a pH range of 4-4.3 (estimated using pH indicator strips). The peat remained damp to the touch or wet throughout the summer and autumn except on two south-facing, well-drained sites on steeper slopes.

Table 1. Average depth of peat substrate for each colony

Depth of substrate	0cm - 10cm	10cm - 20cm	20cm - 30cm	>30 cm
Number of Colonies	6	8	5	2

Associated vegetation

This upland region of wet heath features some level terrain dominated by *Molinia caerulea* and sloped areas with *Calluna vulgaris* and *Erica cinerea*. Two lists of vegetation were compiled (Table 2): the species growing amongst *Lycopodiella inundata* and those bordering each colony (nomenclature follows Stace, 2019). The flora associated with *Lycopodiella inundata* tended to be quite consistent. *Molinia caerulea* – apparently young growth - grew amongst all colonies and *Erica tetralix* was present in seventeen out of twenty one (81%). *Trichophorum germanicum*, *Narthecium ossifragum* and *Drosera rotundifolia* were frequent both within the colonies and the surrounding vegetation. *Calluna vulgaris* was recorded in the vegetation surrounding twenty colonies but within only four colonies.

Bryophytes (mostly mosses; just one liverwort) were recorded amongst the clubmoss in 5 colonies and in the surrounding vegetation of more than half the colonies. It should be noted that bryophytes were looked for in all colonies but were not searched exhaustively. A desiccated algal mat formed a crust on areas of exposed peat within 10 (48%) colonies.

Sward height within the colonies was *c.* 9cm and the vegetation surrounding each colony grew to *c.* 30cm. There was some evidence of light grazing by deer and feral goats where the colonies bordered a track and signs of trampling were noted in half the colonies.

Lycopodiella inundata

The area of each colony was small, nine were <1m² in area, eight had areas of 1m²-2m² and four occupied areas of >2m². The percentage cover of *L. inundata* was 10%-15%, total vegetation cover was generally between 30%-50% although five colonies grew in a dense sward with 60%-80% cover. Vertical stems (0.5cm- 9cm high) and strobili developed slowly and were counted in late September (Fig. 1). These grew between 2cm and 5cm in ten colonies and exceeded 5cm in six. However, the vertical stems produced by plants on

steep slopes, shaded sites or thin peat did not exceed 2cm in height. Sporangia formed on the strobili in all but three colonies, the exceptions being two north-facing sites and one site on thin peat. Sporangia matured and dehisced from the base of the strobilus upwards over a period of 4-6 weeks.

Table 2. Flora associated with *Lycopodiella inundata* colonies

	Plant species growing <u>within</u> the <i>Lycopodiella</i> colonies - percentage of locations recorded	Plant species <u>bordering</u> the <i>Lycopodiella</i> colonies - percentage of locations recorded
1. Vascular plants		
<i>Molinia caerulea</i>	100%	90%
<i>Erica tetralix</i>	81%	100%
<i>Trichophorum germanicum</i>	67%	62%
<i>Narthecium ossifragum</i>	48%	62%
<i>Drosera rotundifolia</i>	38%	71%
<i>Calluna vulgaris</i>	19%	95%
<i>Carex panicea</i>	14%	5%
<i>Carex echinata</i>	10%	33%
<i>Rhynchospora alba</i>	10%	10%
<i>Eriophorum angustifolium</i>	5%	14%
<i>Juncus squarrosus</i>	5%	10%
<i>Juncus acutiflorus</i>	-	10%
<i>Agrostis vinealis</i>	-	10%
<i>Pedicularis sylvatica</i>	-	10%
<i>Ulex gallii</i>	-	5%
<i>Equisetum cf. fluviatile</i>	-	5%
<i>Erica cinerea</i>	-	5%
<i>Potentilla erecta</i>	-	5%
<i>Huperzia selago</i>	-	5%
2. Bryophytes		
<i>Sphagnum papillosum</i>	10%	29%
<i>Racomitrium lanuginosum</i>	10%	57%
<i>Odontoschisma sphagni</i>	5%	-
<i>Sphagnum capillifolium</i>	-	10%
<i>Sphagnum cf. denticulatum</i>	-	10%
<i>Sphagnum tenellum</i>	-	5%
<i>Campylopus atrovirens</i>	-	5%
3. Algae		
Algal mat	48%	-

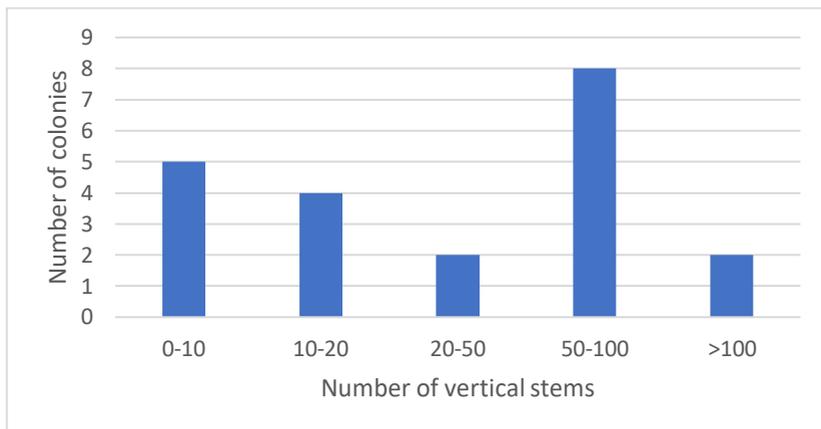


Fig. 1. The number of vertical stems in each colony.

Discussion

The larger colonies, those with areas around 2m², appear vigorous and healthy with numerous tall, sturdy vertical stems bearing fertile strobili whereas some smaller colonies had weaker prostrate stems that produced fewer, shorter vertical stems. The 2 north-facing colonies were noticeably thin-stemmed with no visible sporangia. It is difficult to estimate the ages of these colonies. Byfield & Stewart (2007) suggest an average growth rate of 3cm per annum. The prostrate stems found in Wicklow rarely exceeded 20 cm in length indicating an age of approximately seven years. However, the older parts of the stems die back at the end of the growing season and sections of partially decomposed prostrate stems were visible in some sites (see Page 43), so it is possible that these colonies may be significantly older.

Lycopodiella inundata is a plant of modest stature and will struggle to compete with its larger heathland neighbours, so the future prospects for these colonies will depend in part on how quickly the surrounding vegetation encroaches. Rasmussen and Lawesson (2002) suggest that the species can tolerate a wide range of soil pH and soil moisture levels but appears to be intolerant to shading and eutrophication. Many colonies are on or at the border of tracks used by deer and feral goats. The openness of these sites is likely maintained by animal movement, grazing and by water erosion after heavy rain. It is to be hoped that the benefit of open ground maintained by surface water flow, trampling and grazing will exceed the cost of eutrophication by deer and goat droppings. In prolonged dry periods the clubmoss may benefit from the presence of algal mats as the surface crust slows the desiccation of the peat below (Conaghan *et al.*, 2000).

The prostrate habit and bright green colour of the plant ensure it is effectively ‘camouflaged’ and easily overlooked. This was a serendipitous find. Further monitoring of the site is urged. Perhaps the associated vegetation and habitat descriptions presented here may facilitate the finding of other colonies in Wicklow.



Plate 1



Plate 2





Plate 4b



Plate 5a

Plate 5b



Flowering *Trifolium suffocatum* (Suffocated Clover), Ferrycarrig Castle, Co. Wexford
(H12). Photo P.R. Green © 2022 (p. 34)



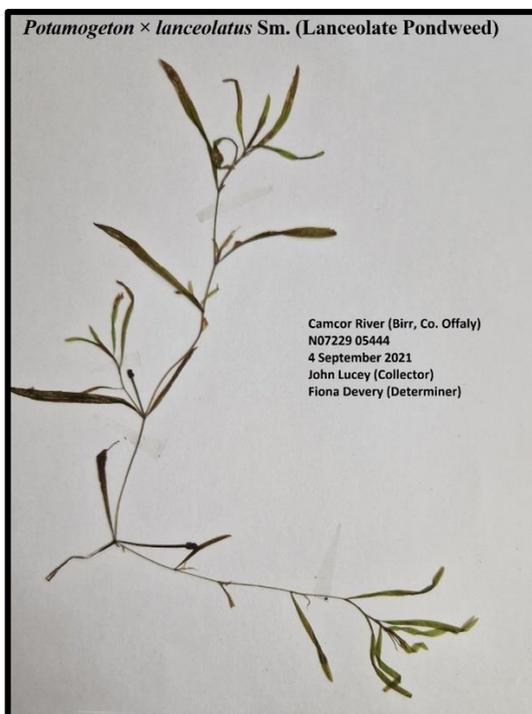
Dactylorhiza purpurella (Northern Marsh-orchid) from Moneygorm, Co. Waterford (**H6**).
Photo A. Malcolm © 2022 (p. 78)



Lycopodiella inundata (Marsh Clubmoss) from Co. Wicklow (**H20**), with new growth,
stems dying back, partially decomposed stems and algal mat all in view. Photo P. Lenihan
© 2022 (p. 35)



Hypopitys monotropa (Yellow Bird's-nest) under beech, Coole Park, South-east Galway (H15), 13th July, 2022. Photo M. Sheehy-Skeffington © 2022 (p. 69)



Tentative *Potamogeton* × *lanceolatus* (*P. coloratus* × *P. berchtoldii*) voucher specimen PAGE 44
from Camcor River, near Birr, Co. Offaly (H18), 4th September 2021. Photo F. Devery ©
2022 (p. 51)

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The front cover of the first issue (Number 1) of *Irish Botanical News* published in
February 1991 (p. 20)



White-flowered form of *Gymnadenia conopsea* (Fragrant Orchid) from the Easkey River valley, Ox Mountains, Co. Sligo (**H28**). Photo E. Gaughan © 2022 (p. 76)

Acknowledgements

My sincere thanks to Daniel Kelly for his helpful suggestions and photographs, to Melinda Lyons for her help identifying bryophytes and to Catriona Brady for her assistance in the field. To Pat Lenihan and Ida Carroll for their photographs, to Olwyn O'Neill and members of the DNFC for their assistance.

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Hunting for wintergreen horsetails in Co. Louth (H31)

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Having finished college for the Christmas break, I was looking for some interesting species that I could focus on searching for over the winter. Since I was unfamiliar with the wintergreen *Equisetum* (Horsetail) species and the vegetation is lower at this time of the year, I decided this would be a suitable group.

There are eight horsetail species (excluding hybrids) found in Ireland, seven of which occur in Co. Louth (**H31**). *Equisetum pratense* (Shady Horsetail) is absent from the county, the nearest site being 30km north of the VC boundary in Co. Down (**H38**) (Botanical Society of Britain and Ireland, 2023). Two of the eight species are wintergreen: *E. hyemale* (Rough Horsetail) and *E. variegatum* (Variegated Horsetail). Both of these species belong to the subgenus *Hippochaete*, whereas the other taxa are in subgenus *Equisetum*. This is important as hybrids will form within, but not between, the subgenera (Jermy et al., 1998).

A single record of *E. hyemale* from 1906 is listed on the DDb for Co. Louth (Botanical Society of Britain and Ireland, 2023). William de Vismes Kane, who is better known for his studies of Lepidoptera (Praeger, 1949), found it in O09 in the centre of the county. A voucher is deposited in the National Herbarium (DBN), National Botanic Gardens, Glasnevin. However, there is an earlier record from Cooley by Nathaniel Colgan. He found it growing ‘by a stream in the Carlingford Mountains above Omeath, at a height of 800 feet’ (Colgan, 1902).

E. variegatum is restricted to two hectads. The most recent record has been in 2019 by Shane Farrell at Loughanmore, west of Gyles Quay (J10). It has also been found in Baltray in the south of the county.

The hybrid between *E. hyemale* and *E. variegatum* is also wintergreen. *E. x trachyodon* (Mackay’s Horsetail) was recorded by Donal Synnott in 1977 ‘[i]n a marsh on the right bank of the Castleton River below Riverstown, J10’ (Synnott, 1979). Again, this is close to Gyles Quay.

E. x moorei (Moore’s Horsetail) is the fourth wintergreen taxon in Ireland. Semi-evergreen might be a more accurate description as it only remains wintergreen in warm, sheltered locations (Jermy et al., 1998). However, it is restricted to the coasts of Co. Wicklow (H20) and Co. Wexford (H12) (Stace, 2019).

Whilst most of the three taxa can grow in a variety of damp habitats, all of them can be found on the banks of streams or rivers. Hence, I focussed my search in these habitats.

Enda Flynn and I happened to be visiting Co. Leitrim (H29) on the 2nd of January, so we decided to visit a known site for *E. x trachyodon* west of Manorhamilton. It is a magnificent colony, containing thousands of stems growing on a wooded riverbank. Neither of us had seen this taxon before, so getting experience with one of its important characters was a useful exercise. This is the sheath teeth. In *E. x trachyodon*, the teeth are more persistent relative to *E. hyemale*. Also, the teeth apices have a long narrow point that distinguishes it from *E. variegatum*.

Well-informed of the features of *E. x trachyodon*, I set out to re-find its old site in Cooley. Walking from Gyles Quay, I headed up the Castletown River on a couple of occasions in January. Some pteridophytes I encountered included *Asplenium scolopendrium* (Hart’s-tongue) and *Polystichum setiferum* (Soft Shield-fern), the latter growing abundantly. There didn’t appear to be any marshy ground on either side of the river as I walked upstream. Much of the riverbanks were sheep-grazed pasture or had dense vegetation. Some potentially suitable habitat was present (wooded riverbank), but I suspect much of it wasn’t damp enough. There is some marshy ground near the mouth of the river. Unfortunately, this is quite nutrient-rich as shown by the growth of species including *Typha latifolia* (Bulrush) and is an exposed site. In Ireland, many sites for *E. x trachyodon* are sheltered (Online Atlas of the British Flora, 2023). A few years ago, the course of the river changed after a storm. Instead of turning abruptly to flow east (as still depicted on the OSI map for the area), the river continues straight. As I wasn’t very familiar with the habitats here before this event, it’s unclear how this has impacted any potential sites for *E. x trachyodon*.

Next up was a walk along a stream at Ballymakellett. This runs parallel to a forestry plantation and is a secluded location with higher ground on three sides at times.

Firstly, I noticed dead stems of *E. telmateia* (Great Horsetail). These were abundant on the slope to the north. I was unaware the dead stems remained conspicuous during the winter. The ‘ivory-white’ internodes, blackening somewhat during the winter (Merryweather, 2020), and the large stems with erect branching is distinctive. Whilst looking more elegant in the summer, it could be a species to watch out for during any winter botanising in addition to the wintergreen species.

Whilst I was observing *E. telmateia*, Enda spotted *E. hyemale* growing upstream beside the path. I should have learned by now not to let him walk ahead of me because he’ll spot the rarities! The colony consisted of at least 120 stems, a few of which had been trampled by walkers. They were growing through grasses and some *Pteridium aquilinum* (Bracken) so it’s quite likely that they’d be hard to spot during the summer. As it was getting dark when we found them, we couldn’t check the whole length of the stream. I revisited the site a few days later to walk further upstream but no more populations were found. This species was once used as a pan scrubber due to the abundance of silica along its stem ridges (Merryweather, 2020). The bedrock in this area and in the mountains upstream is granite, a silica-rich igneous rock. This fits with the habitat conditions in many other sites (D. Doogue, pers. comm., 2023). Whilst this contributes to the production of acidic conditions, the presence of *E. telmateia* suggests that, at least locally, the soil is base-rich.

Obviously, most of my searches were unsuccessful but they gave me an opportunity to visit new areas. For example, I walked along the Flurry River south from Dromad and in the adjacent woodland. Unfortunately, both *Prunus laurocerasus* (Cherry Laurel) and *Rhododendron ponticum* (Rhododendron) grow here, especially *R. ponticum* which dominates large parts of the woodland and extends to the riverbank. As a consolation for not finding any *Equisetum*, I came across some *Polystichum aculeatum* (Hard Shield-fern), an uncommon species in the county.

Clearly, I was biased to the north of the county in my searches. Perhaps the article’s title is misleading in this respect! However, it shows that when you go in search of a particular group of species it is entirely possible to find them despite the lack of records for a very long period of time. And you may just stumble across some other interesting species.

If you have any records of these wintergreen horsetails in Co. Louth that I haven’t mentioned, then it’d be great if you could let me know. My email address is printed at the top of the article.

Acknowledgements

Thanks to Declan Doogue for an insightful discussion on the habitats of *E. hyemale*.

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On the escape of *Lathraea clandestina* (Purple Toothwort) along the River Tolka in Dublin City

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Lathraea clandestina L. (Purple Toothwort) (Orobanchaceae) is a very rare neophyte garden escape plant species in Ireland. It is a much more widespread neophyte in Britain, particularly within England, but is also scattered in parts of Wales and Scotland (Botanical Society of Britain and Ireland, 2022). In Britain and Ireland, it is known from “*damp places on Salix, Populus and other associates such as Gunnera*” (Stace, 2019). It is considered to be truly native in western and southwestern Europe (Stace, 2019), and the first European record in the botanical literature was from 1578 in north central Spain (Atkinson & Atkinson, 2020). In continental Europe, it is often associated with river and stream banks, and most often riparian or other humid/wet woodlands (Atkinson & Atkinson, 2020). In Europe, a much wider array of host plants have been recorded for the species (Atkinson & Atkinson, 2020). It is the closest relative of our native Irish *Lathraea squamaria* (Toothwort).

As with many other members of the Orobanchaceae family, this species is a holoparasite (a total parasite), lacking any chlorophyll and deriving its nutrition solely via parasitising the roots of host plants (Stace, 2019). The scientific name ‘clandestina’ refers to its penchant for clandestine shaded habitats. Therefore, this species is likely to be under-recorded, especially as it is a perennial underground geophyte which only reveals its diminutive and yet showy purple-flowered inflorescences (which may be hidden below the leaf litter) from April to June, and plants may grow for multiple years underground before flowering (Atkinson & Atkinson, 2020).

The first recorded naturalised populations of *Lathraea clandestina* (Purple Toothwort) in Ireland occur within the National Botanic Gardens, Glasnevin, where the species was originally planted but has since become wild there. It was recorded from wet shaded areas on and near the banks of the River Tolka, which flows west to east along the northern side of the gardens. BSBI (2022) records a second Irish population of the species being found in 2019, just east of the National Botanic Gardens, again along the banks of the River Tolka. The author has also seen (possibly) planted specimens of *L. clandestina* further to the south-east in Griffith Park (in shade near the river banks) in 2022.

The third known naturalised Irish population was found by Alexis FitzGerald and Cathal O’Brien in early April 2022, in an undisclosed location on the banks of the Tolka River further east south-east of the National Botanic Gardens than the previously known populations (see back cover). The species was found to be extensively naturalised under

scrub and herbaceous vegetation below riparian woodland canopy of mostly *Salix* (Willow) species. The scrub habitat was dominated by *Rubus fruticosus* agg. (Brambles), while the herbaceous vegetation adjacent to it was dominated by *Smyrniololus atrum* (Alexanders) and *Urtica dioica* (Common Nettle). The plants were likely parasitising the roots of the canopy *Salix* trees above. Approximately 32 plants were counted here in total, however, the total count is uncertain as many plants were (at least partially) hidden under the herb layer, leaf litter and/or scrub cover. Some plants were also producing multiple inflorescences perhaps from the same underground rooting system, in which case, each close agglomeration of inflorescences was considered as one plant.

This newly discovered population was recorded from a relatively remote, isolated, semi-natural, scrubby river bank habitat and so it is considered unlikely that the species was planted in this exact location. Therefore, given the downstream trajectory of the recorded Dublin populations thus far, it is considered very likely that fertile seeds of this species are being transported downstream along the River Tolka from the original introduction site in the National Botanic Gardens, and which are then depositing on the river banks and become established in suitable habitat, including wet riparian woodland. Indeed, the seeds of this species are explosively ejected and can be spread up to 8 metres in this manner, and movement of seed along watercourses is considered to be “*an important method of dispersal*” of the species (Atkinson & Atkinson, 2020). Although (given its diminutive size) this species does not have the same invasive potential as such fellow riparian non-native invasives like *Impatiens glandulifera* (Himalayan Balsam), it nonetheless has some invasive potential, and it is likely to establish in some areas of downstream wet woodland which are classifiable as the EU Habitats Directive priority Annex I habitat [91E0*] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) (National Parks and Wildlife Service, 2019).

Given the relative inaccessibility of many of the river banks in this area due to dense scrub encroachment and the adjoining urban infrastructure, there may well be further as yet undiscovered populations of the species along the banks of the River Tolka, waiting to be revealed by intrepid botanists.

Acknowledgements

I would like to thank the National Transport Authority for agreeing to the release of the above details on the 2022 plant record.

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Interesting pondweed hybrid in Offaly (H18)

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In September 2021 we discovered what looked like an interesting pondweed in the Camcor River, near Birr, in Co. Offaly. On closer examination the plant keyed out as the rare hybrid *Potamogeton x lanceolatus* (*P. coloratus* x *P. berchtoldii*) (see Page 44), which is only known from west of the Shannon in Clare, Galway and Mayo.

Further searches were undertaken in the following summer when the plant was found, in fairly large amounts, at other sites in the same river as well as in the Little Brosna River at their confluence and downstream into Co. Tipperary. A sample specimen was sent to Nick Stewart who in discussions with Chris Preston more or less confirmed the identification.

A definitive identification, however, can only be confirmed by DNA analysis which will now be carried out.

Botanical records by William Arthur Barnes from Co. Meath (H22)

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(Author Note: Information on the location of Barnes' copy of *Cybele Hibernica* is particularly welcome)

William Arthur Barnes (1839-1912) lived in Co. Meath at Westland, Moynalty for the duration of his life. Having graduated with a BA from Trinity College, University of Dublin in 1868, he subsequently received an award from that university for the exemplary manner in which he managed the farmland at Westland. He was appointed as the first Professor of Agriculture at Trinity College in 1906, a chair which he held for six years. His students were frequent visitors to Westland where his investigations into the use of waste creamery products as a fertiliser received international recognition (Miller 1910). Barnes' botanical activities can be traced back to 1864 when he and his sister Harriet were awarded medals by the Royal Horticultural Society for their collections of dried wild plants from counties Meath and Cavan respectively (Middleton 2014). The location of these herbaria was not resolved by Kent and Allen (1984) and as yet remains unknown. Barnes later pursued his botanical fieldwork while conducting farmland valuations on behalf of the Land Commission (Marshall-Barnes *in litt.* 1985), the twelve volumes of *English Botany* in his ownership indicative of his taxonomic interest. It was during one such farmland visit that he discovered *Sisyrinchium bermudiana* (Blue-eyed-grass) on the lakeshore of Upper Lough Erne, Co. Fermanagh, a significant extension to its then known range in Ireland

(Barnes 1901), though now more widely recorded within that county (Forbes & Northridge 2012). His contribution to the study of the distribution of *Fumaria* in Ireland, instigated by Praeger, was deservedly acknowledged (Praeger 1905). Barnes' specimens, determined by Pugsley in light of the then recent taxonomic revisions (Pugsley 1902), are an important component of the *Fumaria* collection at **DBN**. They include the paralectotypes designated by Sell in 1988 of *F. bastardii* var. *hibernica* (Praeger) Pugsley.

The environs of Barnes' ancestral home near Moynalty provided the hunting ground for many of his botanical discoveries, in particular Westland, Oakley Park and Baltrasna, the connections to these locations evident in his family history. The Barnes' association with Meath began in 1666 when Lieutenant Thomas Barnes was granted lands in the townland of Donore, Moynalty. William Arthur belonged to the eighth of ten generations to live at Donore, inheriting the c.1790 built Westland House and its surrounding 464 acres in 1878 (Bamford 2005).

Westland features prominently amongst the annotations by Barnes in a copy of the second edition of *Cybele Hibernica* (Colgan & Scully 1898) offered for sale at Naughton Booksellers, Dún Laoghaire in 1989. These annotations were transcribed by MN at that time, fortuitously as the current location of the book is unknown. The inscription 'W.A. Barnes, Westland, Moynalty 1901' to the fore of the book is significant given that this was only three years after the publication of *Cybele Hibernica* and the same year as the publication of *Irish Topographical Botany* (Praeger 1901a). Praeger had not included Moynalty in his extensive fieldwork between 1896 and 1900, although he had explored the nearby areas of Nobber, Cruicetown and Kilmainham (Praeger 1896-1900), these being more readily accessible by train. As none of the Meath records by Barnes appear in *Irish Topographical Botany*, it was most likely its publication, or that of *Plant Records Wanted* (Praeger 1901b), which motivated him to record within his home county. The majority of his records originate from the period 1901 to 1906, but some are retrospectively dated as early as 1862, presumably based on specimens submitted to the 1864 Royal Horticultural Society's competition. His commitment to fieldwork, which yielded fifteen taxa new to the county including six listed in *Plant Records Wanted*, was acknowledged by Praeger (1903, 1904 & 1906b). A smaller number of records were made between 1906 and 1909, while none are dated in the years immediately preceding his death in 1912.

The evidence indicates that Barnes and Praeger were in direct communication between 1901 and 1906. Many of the Barnes' records published by Praeger are followed by a note of exclamation (!), which symbol indicates that Praeger had examined a specimen from the named location. The majority of Barnes' specimens deposited in **DBN** are labelled 'Ex. Herb. R. Lloyd Praeger'. Praeger collected *Poa nemoralis* (Wood Meadow-grass) from old walls at Westland during August 1903 (**DBN**). Both visited Breakey Lough that same month. Specimens by Praeger from the lake are dated 23 August 1903, coinciding with his collection of *Geranium columbinum* (Long-stalked Crane's-bill) from Moynalty (**DBN**) where it was known to Barnes for almost four decades. The date of the Breakey Lough visit also coincides with that of Praeger's specimens of *Trifolium campestre* (Hop Trefoil) from a meadow at Moynalty (**DBN**) and of *Carduus nutans* (Musk Thistle) ex hort. Westland (**DBN**).

Barnes' records annotated in his copy of *Cybele Hibernica* (Appendix) far outnumber those published (Praeger 1902, 1903, 1904, 1905, 1906a). His marginalia

included precise locations, often supplemented by topographical and ecological comments, for species many of which are now much rarer in Meath. These annotations provide a snapshot of an era that predates the transition from arable to grassland farming, and the extensive use of lime, herbicides and fertilisers. The land near Westland, just south of Moynalty, consists of brown earth soils of the Kells Series, these being well-drained friable soils suited to tillage and grassland crops (Finch *et al.* 1983). Such ground was also ideal for tillage weeds. *Omalotheca sylvatica* (Heath Cudweed), a herb of dry acidic often sandy soils, was described by Barnes as plentiful in fields at Rathbane, Shancarnan and Stonefield. Equally significant, *Scleranthus annuus* (Annual Knawel), a plant of disturbed sandy soils, was recorded in fields at Glenfield and Shancarnan. The precipitous decline in Ireland of both of these weeds of acid arable ground has resulted in their continued inclusion in the *Flora (Protection) Order* (Government of Ireland 2022). The farm at Westland was home to many other tillage weeds. *Agrostemma githago* (Corncockle), now rare as a crop contaminant due to improved seed-cleaning methods, occurred ‘occasionally in corn’. *Orobanche minor* (Common Broomrape), a parasitic plant, was frequent in the ‘first crop clover’. The annuals *Viola arvensis* (Field Pansy), *Thlaspi arvense* (Field Penny-cress) and *Sherardia arvensis* (Field Madder) were also recorded at Westland along with *Veronica agrestis* (Green Field-speedwell) and *V. polita* (Grey Field-speedwell). The two speedwells noted as being ‘very common’ and ‘common’ respectively are now much scarcer. Also benefiting from the light free-draining soils at Westland were *Valerianella locusta* (Common Cornsalad) and *V. dentata* (Narrow-fruited Cornsalad), the latter then noted as common is now a rare arable weed. A third member of this genus *V. rimosa* (Broad-fruited Cornsalad), also a victim of land-use changes, occurred nearby at Carrickspringan. *Cuscuta epithimum* (Dodder) and *Fumaria densiflora* (Dense-flowered Fumitory) were found on Miss Woods’ farm in the neighbouring townland of Ballintlieve: the Dodder, a rootless parasitic herb, is now seldom found on field crops; the Fumitory is now a very rare plant categorised as regionally extinct on the *Ireland Red List* (Nelson & Marnell 2016), the majority of recent records such as that in Dublin of uncertain provenance due to its inclusion in wildflower seed-mixes (McMullen 2018).

Two of the arable weeds mentioned by Barnes were at that time only becoming established in Ireland. *Veronica persica* (Common Field-speedwell), first recorded from Meath on cultivated land at Beauparc 1895 (RLP **DBN**), was noted by Barnes (without date) as common at Westland. Its subsequent increase within the county contrasts with the now diminished occurrence of *V. agrestis* and *V. polita*, a phenomenon noted elsewhere in Ireland and Britain (Stace & Crawley 2015). *Matricaria discoidea* (Pineappleweed), an ‘aggressive alien’ first recorded from Meath in 1900 on the roadside near Dowth, and between there and Newgrange (Colgan 1900), was noted by Barnes at Ballivor in 1902. It is now widespread throughout Ireland.

In addition to the many tillage weeds evident at Westland, the light soils supported the calcifuges *Hypericum humifusum* (Trailing St John’s-wort) and *Veronica officinalis* (Heath Speedwell), and the calcicoles *Galium verum* (Lady’s Bedstraw), *Centaureum erythraea* (Common Centaury) and *Knautia arvensis* (Field Scabious), the ‘not very frequent’ occurrence of the latter reflecting the preponderance of base-poor soils. Also notable was the presence of *Hypericum maculatum* (Imperforate St John’s-wort), a species with few known Meath sites. Further afield, several now uncommon archaeophytes

occurred on roadsides including *Ballota nigra* (Black Horehound), *Lamium album* (White Dead-nettle), *Conium maculatum* (Hemlock) and *Silybum marianum* (Milk Thistle), the last named being from its only known site within the county. *Verbena officinalis* (Vervain) was recorded along the north side of the R. Nanny.

Wetland plants annotated by Barnes provide a picture of the landscape near Moynalty before localised drainage operations by farmers and the extensive Boyne Arterial Drainage Scheme of 1969-1986. Ground by the lake and streams at Westland was host to *Caltha palustris* (Marsh-marigold), *Persicaria hydropiper* (Water-pepper), *Stellaria alsine* (Bog Stichwort), *Galium palustre* (Common Marsh-bed-straw), *Myosotis scorpioides* (Water Forget-me-not), *M. laxa* (Tufted Forget-me-not), *Veronica scutellata* (Marsh Speedwell), *V. beccabunga* (Brooklime), *Achillea ptarmica* (Sneezewort), *Bidens cernua* (Nodding Bur-marigold) and *Helosciadium nodiflorum* (Fool's-water-cress). Barnes noted that *Angelica sylvestris* (Wild Angelica) was 'too common in Westland lawn' and *Montia fontana* (Blinks) was 'plentiful on back and front avenues', giving an indication of the then damp nature of the property. The most remarkable record at Westland is that of *Sium latifolium* (Great Water-parsnip), but this must be treated with extreme caution. Webb (1956) considered unconfirmed records of this species outside of the Shannon and Erne basins, apart from those on the Boyne, to be most likely referable to *Berula erecta*, a species that Barnes did not record in Meath. Marshes elsewhere in the vicinity of Moynalty supported *Ranunculus lingua* (Greater Spearwort), *Lysimachia tenella* (Bog Pimpernel), *Epilobium palustre* (Marsh Willowherb), *Stellaria palustris* (Marsh Stitchwort) and *Menyanthes trifoliata* (Bogbean). The extent and quality of such wetland habitats in the area is now greatly diminished. *Hypericum elodes* (Marsh St John's-wort), a species particularly susceptible to drainage, was recorded 'at edge of marsh close to road from Virginia Road Station to Oldcastle', this being its only known site within the county. Somewhat further afield, Barnes and Praeger both visited Breakey Lough in August 1903. This was most likely a joint excursion given that Praeger's specimens from Breakey and from Westland were all collected on the same date. Breakey Lough is located within the drumlin belt of N Meath, the flora of such inter-drumlin lakes being distinct from that of other waterbodies within the county. Barnes' records from Breakey included *Nymphaea alba* (White Water-lily), *Cicuta virosa* (Cowbane) and *Persicaria minor* (Small Water-pepper), all of which are uncommon in the county but still persist in N Meath.

A number of other species observed by Barnes have very few Meath records. Those recorded in the vicinity of Moynalty include *Ranunculus auricomus* (Goldilocks Buttercup), *Reseda lutea* (Wild Mignonette), *Lepidium heterophyllum* (Smith's Pepperwort) and *Platanthera bifolia* (Lesser Butterfly-orchid). Elsewhere, *Diplotaxis muralis* (Annual Wall-rocket) occurred at Laytown, while *Gentianella amarella* (Autumn Gentian) was recorded on the road through Allenstown bog. All but *D. muralis* and *P. bifolia* have been recently found within the county, although not necessarily in the same areas as noted by Barnes.

Significant finds by Barnes from the coast near Mayden Tower at Mornington included *Anthriscus caucalis* (Bur Chervil), a rare plant of open well-drained sandy soils not recently seen in Meath, and *Polygonum oxyspermum* (Ray's Knotgrass), a seldom-encountered strandline plant which still occurs sporadically on the gravel shores at Mornington and Laytown. *Apium graveolans* (Celery) was also noted near Mayden Tower

on the R. Boyne and further south on the R. Nanny, a plant that still persists on the muddy tidal sections of both rivers although rarer on the latter.

The wealth of records annotated by Barnes in his copy of *Cybele Hibernica* over a century ago constitute a unique snapshot of the Meath flora, particularly in the neighbourhood of Moynalty, as it existed in the early 1900s. His association with farming meant he was well positioned to document the variety of arable weeds, many of which are now extremely vulnerable. The diversity of wetland plants and the range of rare plants that he recorded are indicative of the richness of habitat types at that time, whose existence is now all too often threatened.

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Appendix

Unless otherwise stated, the following records were annotated by Barnes in his copy of the second edition of *Cybele Hibernica* (Colgan & Scully 1898). The listing follows the taxonomy and nomenclature adopted by Stace (2019), with names used in *Cybele Hibernica* given in parentheses { } where these differ. First county records are indicated by an asterisk (*). All locations, topographical details and ecological comments are as stated by Barnes with comments by MN in square brackets []. Undated records were most likely made between 1901 (the date inscribed by Barnes in *Cybele Hibernica*) and 1909 (the last dated entry before his death in 1912). In some cases, specimens collected by Barnes (WAB) are incorporated into the herbaria of National Botanic Gardens (**DBN**) and National University of Ireland Galway (**GALW**), and these are indicated as such below. Records published by Praeger are referenced, the note of exclamation (!) indicating that Praeger had either examined a specimen provided by Barnes (Barnes!) or had seen the plant growing at the named location (e.g. Moynalty!).

Nymphaea alba (White Water-lily): Breakey Lake [Breakey Lough] 1903.

Nuphur lutea {*Nuphar luteum*} (Yellow Water-lily): in Donover pond 1901.

Papaver rhoeas (Corn Poppy): plentiful about Navan, and in most limestone districts in Meath.

Papaver dubium (Long-headed Poppy): plentiful in Westland till reduced by cultivation. More califuge than calicole. Along sea between Gormanston and Laytown 1902.

Chelidonium majus (Greater Celandine): on road near Ballair 1901.

* *Fumaria bastardii* var. *hibernica* {[included under] *F. confusa*} (Tall Ramping-fumitory) [not annotated by Barnes]; Moynalty 1902, 1903 & 1904 (WAB **DBN**), specimens subsequently determined and designated by Sell in 1988 as paralectotypes of *Fumaria bastardii* var. *hibernica* (Praeger) Pugsley.

Fumaria muralis subsp. *Boraei* {[included under] *F. muralis*} (Common Ramping-fumitory): [not annotated by Barnes]; Moynalty 1904 (WAB **DBN**, det. Sell 1986).

Fumaria officinalis (Common Fumitory): plentiful at Westland 1901; 'Moynalty, '04 - W.A. Barnes' (Praeger 1905). *F. officinalis* subsp. *officinalis* var. *elegans*: Moynalty 1904 (WAB **DBN**, det. Sell 1986). *F. officinalis* subsp. *wirtgenii* var. *wirtgenii*: Moynalty 1904 (WAB **DBN**, det. Sell 1986). [Varieties follow taxonomy and nomenclature adopted by Sell & Murrell 2018].

* *Fumaria densiflora* (Dense-flowered Fumitory): in a field in Miss Woods' farm, Ballintlieve 1903; Moynalty 1904 (WAB **DBN**, fide Pugsley); 'Moynalty, '04 - W.A. Barnes' (Praeger 1905).

Caltha palustris (Marsh-marigold): plentiful at Westland 1901.

Clematis vitalba (Traveller's-joy): on road between Slane and Drogheda 1905.

Ranunculus acris (Meadow Buttercup): plentiful at Westland 1901.

Ranunculus bulbosus (Bulbous Buttercup): plentiful at Miller's field Westland, also in other field of old pasture. A variety with green flowers in bottom near Screen [= Screebog?] 1901.

Ranunculus auricomus (Goldilocks Buttercup): roadside between Virginia Road Station and Woodpole, at Balgree 1903.

- Ranunculus sceleratus* (Celery-leaved Buttercup): frequent about Westland; in most of marshes about Westland 1901.
- Ranunculus lingua* (Greater Spearwort): plentiful in marsh at foot of Pat Sheridan's garden, Westland. Common in marshes around Westland.
- Ranunculus flammula* (Lesser Spearwort): in all the marshes about Westland.
- Ranunculus hederaceus* (Ivy-leaved Crowfoot): in a marsh in Doneen; Westland.
- Ranunculus circinatus* (Fan-leaved Water-crowfoot): drain from Curragh.
- Ficaria verna* {*Ranunculus ficaria*} (Lesser Celandine): plentiful at Westland 1901.
- Thalictrum flavum* (Common Meadow-rue): plentiful in a meadow near Ballivor 1900.
- Lotus corniculatus* (Common Bird's-foot-trefoil): common at Westland.
- Lotus pedunculatus* {*L. uliginosus*} (Greater Bird's-foot-trefoil): common at Westland.
- Lathyrus pratensis* (Meadow Vetchling): common at Westland.
- Trifolium campestre* {*T. agrarium*} (Hop Trefoil): in Miss Woods' farm Ballintlieve 1903; meadow, Moynalty 1903 (RLP **DBN**); 'Meadows at Moynalty, '03' (Praeger 1904).
- Trifolium dubium* (Lesser Trefoil): common at Westland.
- Trifolium medium* (Zigzag Clover): along Navan to Kingscourt railway; Lynch's Island, Oakley Park.
- Cytisus scoparius* (Broom): frequent at Westland.
- Polygala vulgaris* (Common Milkwort): in a field along Borora [River] in Ballintlieve 1863-1903.
- Agrimonia eupatoria* (Agrimony): plentiful on the road between Williamstown front gate and Norbinstown 1903.
- Hypericum perforatum* (Perforate St John's-wort): in limestone districts.
- * *Hypericum maculatum* {*H. dubium*} (Imperforate St John's-wort): at Westland 1865-1905. [Listed for Meath in *Plant Records Wanted* (Praeger 1901b)].
- Hypericum humifusum* (Trailing St John's-wort): fairly frequent on recently laid down fields at Westland 1900; 'Moynalty, '02 – Barnes' (Praeger 1903).
- Hypericum pulchrum* (Slender St John's-wort): on road opposite front gate Westland 1865-1905.
- * *Hypericum elodes* (Marsh St John's-wort) at edge of marsh close to road from Virginia Road Station to Oldcastle, about half mile from station on farm of Bartle Costelloe (Clonasillagh) north side of road 1904; marsh, near Virginia Road Station, Co. Meath (WAB **DBN**); 'Near Virginia Road Station, '05 – W.A. Barnes!' (Praeger 1906a).
- Viola tricolor* {*V. curtisii*} (Wild Pansy): common between mouth of Boyne and Bettystown 1902.
- Viola arvensis* (Field Pansy): common at Westland 1863-1903.
- Linum bienne* {*L. angustifolium*} (Pale Flax): in field on farm of [The?] Lynch, Gillstown; between Beauparc and Duleek 1905.
- Linum catharticum* (Fairy Flax): Lynch's Island, Oakley Park; Turkstown; Baltrasna 1900.
- * *Geranium columbinum* (Long-stalked Crane's-bill): fairly plentiful in Miss Woods' farm, Ballintlieve and along the lane from it to road 1863-1901; edges of fields for the last 30 years, Moynalty 1902 (WAB **DBN** & **GALW**) & old hedgebank, Moynalty 1903 (RLP **DBN**); 'In plenty at Moynalty, on edges of cultivated fields in light

soil '01- W. A. Barnes!' (Praeger 1902); 'In old stony hedgebanks as well as cultivated fields at Moynalty! For 40 years past - Barnes' 1903 (Praeger 1904).

Geranium pyrenaicum (Hedgerow Crane's-bill): on road near Newtown Church 1901; near Mabe's Bridge on Kells road.

Geranium molle (Dove's-foot Crane's-bill): abundant at Westland 1863-1901.

Geranium lucidum (Shinning Crane's-bill): abundant on road between Kells and Mabe's Bridge 1863-1905.

Geranium robertianum (Herb-Robert): very common at Westland.

Erodium cicutarium (Common Stork's-bill): between Laytown and Mayden Tower 1902.

Epilobium palustre (Marsh Willowherb): in marshes about Westland 1900.

* *Chamaenerion angustifolium* {*Epilobium angustifolium*} (Rosebay Willowherb): on Rahendrick Bog 1909.

Circaea lutetiana (Enchanter's-nightshade): at Westland 1865-1905.

Malva moschata (Musk Mallow): on road in Ballintlieve 1865; in field at Kingsfort 1900.

Malva sylvestris (Common Mallow): close to Kells on road to Ballalley 1903.

Malva pusilla {*M. rotundifolia*} (Small Mallow): close to Nobber on road to Whitewood 1900; at Collierstown along road south of Bellewstown race course 1904.

Reseda luteola (Weld): plentiful on side of old limestone quarry at Mabe's Bridge next road from Moynalty to Kells 1903.

Reseda lutea (Wild Mignonette): on road from Moynalty to Kingscourt at Carrickspringan 1863, 'not seen since'.

Capsella bursa-pastoris (Shepard's-purse): at Westland 1863-1901.

Barbarea vulgaris (Winter-cress): common about Westland.

Rorippa palustris {*Nasturtium palustre*} (Marsh Yellow-cress): along Blackwater on south side between Maudlin Bridge and Headfort 1901; along road from Moynalty to Carlanstown in damp hollow at commencement of Newtown to south of farm house on east of road 1903.

Nasturtium officinale (Water-cress): plentiful in stream by Carrolan's ground between Westland and Kingsfort 1901.

Cardamine pratensis (Cuckooflower): common at Westland 1901.

Cardamine flexuosa (Wavy Bitter-cress): frequent at Westland.

Cardamine hirsuta (Hairy Bitter-cress): common at Westland 1901.

Lepidium heterophyllum {*L. hirtum*} (Smith's Pepperwort): along road from Moynalty to Bailieborough at Newcastle 1902; 'North of Carnross '02 -Barnes!' [Carnaross] (Praeger 1903).

Erophila verna sensu lato {*E. vulgaris*} (Common Whitlowgrass): at Westland and on Moynalty Bridge.

Diplotaxis muralis (Annual Wall-rocket): on Wooden Bridge [wooden bridge?], Laytown 1905.

Brassica rapa (Turnip): abundant along mearing drain between Baltrasna and Oakley Park in Lynch Field 1902.

Sinapsis arvensis {*Brassica sinapsis*} (Charlock): at Westland 1901.

Cakile maritima (Sea Rocket): near Mayden Tower, mouth of Boyne 1902.

Sisymbrium officinale (Hedge Mustard): on roads about Westland, not very plentiful 1901.

Alliaria petiolata {*Sisymbrium alliaria*} (Garlic Mustard): at entrance to Crockawella, Westland; at Avondale crossroads near Moynalty 1862-1901.

Thlaspi arvense (Field Penny-cress): at Westland School House on soil by foundations 1906.

Cochlearia anglica (English Scurvygrass): [not annotated by Barnes]; S bank of R. Boyne two miles W of Drogheda 1904 (WAB **DBN**, det. Wyse Jackson 1972); 'South bank of R. Boyne above Drogheda, '05 – W.A. Barnes!' (Praeger 1906a).

Cochlearia officinalis agg. {*C. officinalis*} (Scurvygrass): common along south side of Boyne between Drogheda and sea.

Persicaria maculosa {*Polygonum persicaria*} (Redshank): abundant at Westland.

Persicaria lapathifolia (Pale Persicaria): frequent at Westland.

Persicaria hydropiper (Water-pepper): common at Westland.

* *Persicaria minor* {*Polygonum minus*} (Small Water-pepper): on shore Breakey Lake 1903; 'Breakey Lough, '03 – P' (Praeger 1904); [Barnes and Praeger both visited Breakey Lough in August 1903].

Polygonum oxyspermum {*P. Raii*} (Ray's Knotgrass): near Mayden Tower 1902.

Polygonum aviculare agg. {*P. aviculare*} (Knotgrass): too common at Westland.

Fallopia convolvulus {*Polygonum convolvulus*} (Black Bind-weed): common at Westland.

Moehringia trinervia {*Arenaria trinervia*} (Three-nerved Sandwort): on wall along west of road at Oakley Park 1904.

Stellaria media (Common Chickweed): too common at Westland.

Stellaria holostea (Great Stitchwort): on road through Billywood near Farranadoony School House 1906.

Stellaria palustris (Marsh Stitchwort): in marsh at Williamstown 1903; opposite Oakley Park House 1903.

Stellaria graminea (Lesser Stitchwort): common at Westland.

Stellaria alsine {*S. uliginosa*} (Bog Stichwort): common at Westland.

* *Scleranthus annuus* (Annual Knawel): along easterly headlands of Glenfield and Carrolan's ground [= Shancarnan] 1902; 'Moynalty in fields, '02 – Barnes!' (Praeger 1903).

Agrostemma githago {*Lychnis githago*} (Corncockle): occasionally in corn at Westland, rare.

Silene uniflora {*S. maritima*} (Sea Campion): near Mayden Tower, mouth of Boyne 1902.

Silene vulgaris {*S. cucubalus*} (Bladder Campion): at Westland, not very common.

Silene latifolia {*Lychnis vespertina*} (White Campion): near Mayden Tower, mouth of Boyne 1902; Laytown 1905.

Silene flos-cuculi {*Lychnis flos-cuculi*} (Ragged-Robin): frequent about Westland, west of pond 1900.

* *Montia fontana* (Blinks): plentiful on back and front avenues, Westland; 'Moynalty, '02 – Barnes!' (Praeger 1903). [Listed for Meath in *Plant Records Wanted* (Praeger 1901b)].

* *Cornus sanguinea* (Dogwood): in bog at Oakley Park. [*C. sericea* is widely planted in the county].

Primula vulgaris (Primrose): common at Westland.

Primula veris {*P. officinalis*} (Cowslip): common at Westland lawn.

- Lysimachia vulgaris* (Yellow Loosestrife): frequent on Blackwater; at Bathing House, Cakestown [N of Kells] and on island above Clavens Bridge 1900; 'Moynalty, '02 -Barnes!' (Praeger 1903).
- Lysimachia nummularia* {Creeping-Jenny}: along the Boyne about 2 miles west of Drogheda 1904.
- Lysimachia tenella* {*Anagallis tenella*} (Bog Pimpernel): Lynch's Island, Oakley Park.
- * *Lysimachia nemorum* (Yellow Pimpernel): on road from Moynalty to Bailieboro[ugh] 1902; ditto from Moynalty to Kingscourt 1905; Meath (Praeger 1903); Moynalty (Praeger 1904). [Listed for Meath in *Plant Records Wanted* (Praeger 1901b)].
- Lysimachia arvensis* {*Anagallis arvensis*} (Scarlet Pimpernel): very common at Westland.
- Samolus valerandi* (Brookweed): plentiful in marsh below Drogheda railway bridge.
- Sherardia arvensis* (Field Madder): common at Westland.
- Galium odoratum* {*Asperula odorata*} (Woodruff): on road between Farranadoony and Billywood Cross Roads 1902.
- Galium palustre* (Common Marsh-bed-straw): common at Westland.
- Galium verum* (Lady's Bedstraw): common about Westland.
- Galium saxatile* (Heath Bedstraw): on road near Mullagh Bridge. [Mullagh Bridge is on the border between Meath and Cavan; thus this record may be assignable to either county.]
- Galium aparine* (Cleavers): too common at Westland.
- Centaureum erythraea* {*Erythraea Centaureum*} (Common Centaury): at Westland.
- Blackstonia perfoliata* {*Chlora perfoliata*} (Yellow-wort): in townland of Ballymad, south of Pilltown 1904.
- Gentianella amarella* (Autumn Gentian): on road through Allenstown bog [= SE of Kells] 1900.
- Echium vulgare* (Viper's-bugloss): common near Mayden Tower, Boyne mouth 1902.
- Lycopsis arvensis* (Bugloss): occasional at Westland.
- Myosotis scorpioides* {*M. palustris*} (Water Forget-me-not): common along streams at Westland.
- Myosotis secunda* {*M. repens*} (Creeping Forget-me-not): on road from Moynalty to Kingscourt 1905.
- Myosotis laxa* {*M. caespitosa*} (Tufted Forget-me-not): frequent at Westland.
- Myosotis arvensis* (Field Forget-me-not): very common at Westland.
- Myosotis discolor* {*M. versicolor*} (Changing Forget-me-not): at Westland 1900.
- Calystegia sepium* (Hedge Bindweed): common at Westland.
- Cuscuta epithymum* {*C. trifolia*} (Dodder): Miss Woods' farm, Ballintlieve 1905; meadow, Westland 1905 (WAB, DBN).
- Solanum dulcamara* (Bittersweet): [ticked, no detail given].
- Fraxinus excelsior* (Ash): common at Westland.
- Ligustrum vulgare* (Wild Privet): common about Westland.
- Veronica officinalis* (Heath Speedwell): frequent at Westland.
- * *Veronica scutellata* (Marsh Speedwell) Westland: in marsh at S corner of Carrolan's ground 1904; 'Moynalty, '02 – Barnes!' (Praeger 1903). [Listed for Meath in *Plant Records Wanted* (Praeger 1901b)].
- Veronica beccabunga* (Brooklime): common by streams at Westland.

- V. anagallis-aquatica* sensu lato {*Veronica anagallis*} (Blue Water-speedwell): in drains in Crockawella and bottoms 1902.
- Veronica serpyllifolia* (Thyme-leaved Speedwell): frequent at Westland.
- * *Veronica agrestis* (Green Field-Speedwell): very common at Westland 1901; 'Moynalty '01 - W.A. Barnes!' (Praeger 1902). [Listed for Meath in *Plant Records Wanted* (Praeger 1901b)].
- Veronica polita* (Grey Field-speedwell): common at Westland 1902.
- Veronica persica* {*V. tournefortii*} (Common Field-speedwell): common at Westland.
- Veronica chamaedrys* (Germander Speedwell): abundant at Westland.
- Veronica arvensis* (Wall Speedwell): frequent at Westland.
- Chaenorhinum minus* {*Linaria minor*} (Small Toadflax): Kilmessan.
- Plantago major* (Greater Plantain): [ticked, no detail given].
- Plantago lanceolata* (Ribwort Plantain): [ticked, no detail given].
- Litorea uniflora* {*L. lacustris*} (Shoreweed): common on shore of Breakey Lake 1903.
- Verbascum thapsus* (Great Mullein): Foot Bill Field at Westland 1870-1905.
- Scrophularia auriculata* {*S. aquatica*} (Water Figwort): along stream at Oakley Park.
- Verbena officinalis* (Vervain): along north side of River Nanny at Smithstown (English's fruit farm) 1904.
- Ballota nigra* (Black Horehound): on road between Rahood and Nobber.
- Lamium album* (White Dead-nettle): common roads about Westland and on roads from Moynalty to Kells 1900.
- Ajuga reptans* (Bugle): common along Borora [River] 1885-1905.
- Origanum vulgare* (Wild Marjoram): abundant on road from Oldcastle to Finea.
- Lycopus europaeus* (Gypsywort): sides of Williamstown Lake 1903.
- Euphrasia officinalis* agg. {*E. officinalis*} (Eyebright): Westland, frequent.
- Odontites vernus* {*Bartsia odontites*} (Red Bartsia): common at Westland.
- Orobanche minor* (Common Broomrape): frequent in first crop clover at Westland 1900.
- Menyanthes trifoliata* (Bogbean): very common in marshes around Westland; very common between Boyne mouth and Gormanstown.
- Carlina vulgaris* (Carline Thistle): plentiful in light hills [light soils?] at Cullendragh about 5 miles from Oldcastle on road to Finea (in Crean's farm).
- * *Silybum marianum* (Milk Thistle): on road between Trim south and Ballivor about half way on north side of road 1901; 'Several places between Trim and Ballivor, '02 - Barnes!' (Praeger 1903).
- Sonchus arvensis* (Perennial Sowthistle): on Kells road at Oakley Park and limekiln at Westland 1902.
- Sonchus oleraceus* (Smooth Sowthistle): at Westland.
- Sonchus asper* (Prickly Sowthistle): very common at Westland.
- Omalothea sylvatica* {*Gnaphalium sylvaticum*} (Heath Cudweed): plentiful in two fields close to Maxwell's Cross, in Rathbane and in Shancarnan (Carrolan's farm) 1901; plentiful in Farrelly's Farm, Stonefield 1905; 'North of Moynalty abundant, '02 - Barnes' (Praeger 1903).
- Tripolium pannonicum* {*Aster tripolium*} (Sea Aster): abundant along Boyne from Drogheda to sea.
- Bellis perennis* (Daisy): at Westland.

Achillea ptarmica (Sneezewort): common at Westland.
Achillea millefolium (Yarrow): abundant at Westland.
Matricaria discoidea (Pineappleweed): near Ballivor 1902; 'Ballivor!' (Praeger 1905).
Bidens cernua (Nodding Bur-marigold): at Westland pond and abundant in marshes in Baltrasna.
* *Bidens tripartita* (Trifid Bur-marigold): in ditch along road through Feegat 1901; in hollow near farm house at beginning of Newtown, to east of road, Moynalty to Carlanstown 1903; 'Moynalty, '02 - Barnes!' (Praeger 1903). [Listed for Meath in *Plant Records Wanted* (Praeger 1901b)].
Eupatorium cannabinum (Hemp-agrimony): in most lime districts along water.
Valerianella locusta {*V. olitoria*} (Common Cornsalad): common about Westland.
Valerianella rimosa {*V. auricula*} (Broad-fruited Cornsalad): on road from Moynalty to Kingscourt at Carrickspringan 1903.
Valerianella dentata (Narrow-fruited Cornsalad): common at Westland.
Valeriana officinalis (Common Valerian): frequent along Borora River.
Knautia arvensis {*Scabiosa arvensis*} (Field Scabious): at Westland, not very frequent.
Succisa pratensis {*Scabiosa succisa*} (Devil's-bit Scabious): common on coarse pastures.
Hedera helix sensu lato {*H. helix*} (Ivy): too common at Westland.
Sanicula europaea (Sanicle): on road from Ballivor to Hill of Down; at Kilmer 1900.
Oenanthe aquatica {*O. phellandrium*} (Fine-leaved Water-dropwort): in drain from Curracusheen Lough to Borora River near Carlanstown 1905.
Sium lathifolium (Great Water-parsnip): at Westland 1900. [Webb (1956) considered unconfirmed records outside of the Shannon and Erne basins, apart from those on the Boyne, most likely referable to *Sium* (*Berula*) *erecta*, a species not recorded by Barnes in Meath.]
Helosciadium nodiflorum {*Apium nodiflorum*} (Fool's-water-cress): common about Westland.
Cicuta virosa (Cowbane): abundant in and around Breakey Lakes 1903.
Smyrniolum olusatrum (Alexanders): at the cross road Moynalty 1865-1905.
Anthriscus sylvestris (Cow Parsley): plentiful in roads about Kells; at bridge over stream between Westland and Kingsfort; on road from Moynalty to Carnaross.
Anthriscus caucalis {*A. vulgaris*} (Bur Chervil): at Maiden Tower mouth of Boyne 1902.
Torilis japonica {*Caucalis anthriscus*} (Upright Hedge-parsley): common about Westland.
Torilis nodosa {*Caucalis nodosa*} (Knotted Hedge-parsley): along stream at Saltford, Moynalty 1900; 'Moynalty, '02, Barnes!' (Praeger 1903).
Daucus carota (Wild Carrot): at Baltrasna near quarry; common in limey soils in Meath but not elsewhere 1900.
Heracleum sphondylium (Hogweed): too common at Westland.
Aegopodium podagraria (Ground Elder): too plentiful at Westland.
Apium graveolans (Celery): near Maiden Tower, Boyne mouth 1902; on [River] Nanny 1905.
Conium maculatum (Hemlock): on road from Carlanstown to Oristown, quarter mile from Carlanstown 1900.
Angelica sylvestris (Wild Angelica): too common in Westland lawn 1900.

Platanthera bifolia {*Habenaria bifolia*} (Lesser Butterfly-orchid): on bottoms along Borora River, frequent.

Gymnadenia conopsea sensu lato {*Habenaria conopsea*} (Chalk Fragrant-orchid): along south side of railway from Kilmessan to Trim.

Anacamptis pyramidalis {*Orchis pyramidalis*} (Pyramidal Orchid): frequent about halfway on road from Trim Station to Ballivor 1901.

An annotated checklist of *Potamogeton* L. and *Stuckenia* Börner (Pondweeds) in Co. Meath (H22)

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The diversity of wetland types in Co. Meath (H22) provides an abundance of suitable habitats for pondweeds. The R. Boyne, together with its main tributary the R. Blackwater, transverses much of the county and has its own unique *Potamogeton* flora which includes three hybrids and their parent species. The associated Boyne Navigation or Boyne Canal, built to bypass the many weirs on the lower section of the river, consists of a series of now mostly derelict canals between Navan and Oldbridge. The Royal Canal differs in its continuous nature, its waters supplied primarily from the spring-fed lime-rich Lough Owel before flowing from its summit level near Mullingar in Westmeath through Meath, and thence onto Kildare and Dublin. Important aquatic habitats are also provided by the inter-drumlin lakes of N Meath, and the marl-rich lakes of NW Meath. The wetlands of the esker-rich SW Meath, and the pools and drains within the bogs of W Meath, are also of interest. Additionally, there are quarry ponds and artificial lakes scattered throughout the county.

The following checklist employs the taxonomy and nomenclature adopted by Stace (2019). Synonyms are given where the published record differs to Stace. All species included are of native status (Jebb 2019). The relative frequency and habitats of each taxon are given. The first record may be given in more than one state: a hitherto unpublished field record, a herbarium specimen, or a published record. Place names are as stated in the original record and are thus not always closely localised or assignable to a specific hectad. The R. Blackwater refers to that which joins the R. Boyne at Navan rather than the smaller R. Blackwater near Longwood. The suffix BGX indicates that the record was made on a hectad basis using an extension of the British Grid (Perring & Walters 1962). Initials are used to identify recorders and collectors as follows: CB (Charles Bailey), CDP (Chris D. Preston), DM (David Moore), DMcC (David McClintock), EPA (Environmental Protection Agency), HCH (Henry C. Hart), MN (Margaret Norton), RLP (Robert L. Praeger) and RPM (Richard P. Murray). Surnames are given for determiners and authors of published records. RLP-*Lond. Cat.* refers to Praeger's annotated copy for Meath of *The London catalogue of British plants* (Praeger 1896-1900). Acronyms for herbaria are given in bold and follow Kent and Allen (1984). Some of the specimens referenced may no longer exist as many, including a number on loan to Dandy and Taylor from several institutions, were damaged

when incendiary bombs fell on the British Museum in 1940 (Preston 1988). The hectad distribution of each taxon is listed, the brackets indicating that only pre-2000 records are known.

Potamogeton natans L. Broad-leaved Pondweed

Widespread and common, often dominating the water's surface. Standing and smooth-flowing permanent waterbodies of moderate depth. Inter-drumlin lakes of N Meath; marl-rich lakes of NW Meath; quarry ponds of esker-rich SW Meath and of shales near Moynalty; margins of slow-flowing rivers; Boyne and Royal canals; deep ponds of cutover bogs and fen peat; artificial lakes.

First record(s): Enfield & near 1896 (RLP-*Lond. Cat.*); H22 (Praeger 1901). [Earlier records from 'Curragha bogs' which straddled the Dublin-Meath border and from the Royal Canal (Baily 1833) did not specify counties.]

Distribution: N48, 54, 57, 64, 65, (66), 67, 74-6, (77), 78, 79, 84-6, (88), 89, 93, 94, (95), 97; O(06), 07, 16, 17.

Potamogeton polygonifolius Pourr. Bog Pondweed

Localised and occasional, often plentiful. Most frequent in shallow water of bog pools and drains; more rarely in pools on fen peat.

First record(s): bog 4 miles ENE of Athboy 1896 (RLP-*Lond. Cat.*); H22 (Praeger 1901).

Distribution: N48, 57, 58, 64, (65), 66, (75), 87, 89.

Potamogeton coloratus Hornem. Fen Pondweed

Localised and uncommon. Base-rich water of shallow to moderate depth. Most frequent in the marl-rich area of NW Meath and the esker-rich area of SW Meath. Pools and drains in fen peat; ponds of disused limestone quarries; by and in the Royal Canal.

First record(s): Enfield & near 1896 (RLP-*Lond. Cat.*); 'canal at Enfield' and 'ditch, Enfield', both 1896 (RLP **DBN**, conf. Dandy); (as *P. plantagineus*) Enfield 1896 (Praeger 1901).

Distribution: N57, (66), 74, 84, 85, 86.

Potamogeton lucens L. Shining Pondweed

Localised and occasional. Standing and smooth-flowing deep waters rich in calcium. Inter-drumlin lakes of N Meath; marl-rich lakes of NW Meath; Royal and Boyne canals; rare in the lower R. Boyne.

First record: in the canal [Boyne] at Navan 1868 (CB, More 1872). [The earlier record from the Royal Canal (Baily 1833) did not specify counties].

Distribution: N48, 57, 64, (86), 88, (97), 98; O07.

Potamogeton x angustifolius J. Presl. (*P. lucens* x *P. gramineus*) Long-leaved Pondweed

Localised and occasional. Scattered in the R. Boyne from below Navan to above Slane Bridge, and in its canal from Navan to Oldbridge; also in its tributary the R. Blackwater. The *P. lucens* parent is relatively rare in the Boyne river and canal, and has not been recorded from the Blackwater. The *P. gramineus* parent is abundant in the R. Boyne and occasional in the R. Blackwater.

First record: (as *P. angustifolius*) plentiful in the Boyne at Bective 1896 (Praeger 1897).

Distribution: N(85), 86, 87, 97; O07.

Potamogeton x salicifolius Wolfg. (*P. lucens* x *P. perfoliatus*) Willow-leaved Pondweed

Localised and uncommon, both in Meath and in Ireland. Smooth-flowing deep water. Recorded from the Boyne Canal near Navan, and by riverbanks of the Boyne between Navan and Roughgrange. The *P. lucens* parent is relatively rare in the Boyne, whereas the *P. perfoliatus* parent is common.

First record: (as *P. decipiens*) Boyne Canal at Navan 1868 (CB **BM** & **MANCH**, det. Dandy & Taylor). The Botanical Exchange Club (Boswell Syme 1869) reported: 'Mr. Charles Bailey sends a specimen of this plant from the canal at Navan, collected in 1868. Unfortunately, he was not aware at the time he gathered it that it was a plant new to the Irish Flora, and so brought away only two specimens'. [An earlier specimen from the R. Liffey near the Salmon Leap in Co. Dublin 1866 (HCH **DBN**) was subsequently determined by Dandy.]

Distribution: N86, 97; O07.

Potamogeton gramineus L. **Various-leaved Pondweed**

Widespread and locally abundant, often as dense beds, in the R. Boyne; also present in the Boyne Canal and R. Blackwater. The *P. gramineus* of the R. Boyne, much of which is exceptionally long-leaved, was a source of great interest in the latter half of the nineteenth century. Tentatively listed under *P. heterophyllus* [= *P. gramineus*] (Moore & More 1866), alternative proposed identities included that of the American species *P. lonchitis* (Boswell Syme 1869). This uncertainty stimulated a substantial accumulation of herbarium material. First collected by Moore in 1857, it was also gathered from Navan between 1866 and 1896 by Bailey, W.R. Linton, E.F. Linton, Praeger and Scully. Many of their specimens, some distributed through the Botanical Exchange Club, were later deposited in **ABS**, **BIRM**, **BM**, **CGE**, **DBN**, **E**, **LSR**, **MANCH**, **NCH** and **SLBI**. All such plants subsequently viewed by Dandy & Taylor were determined as *P. gramineus*.

First record(s): R. Boyne below Navan 1857 (DM **CGE**, det. Dandy & Taylor) [an undated specimen by Moore from the R. Boyne exists in **DBN**]; 'A singular plant, with long lanceolate submerged leaves, occurring in the R. Boyne, below Navan, may belong to the present species' [= *P. heterophyllus*] (Moore & More 1866).

Distribution: N(75), 77, 85-7, 97; O07.

Potamogeton x nitens Weber (*P. gramineus* x *P. perfoliatus*) **Bright-leaved Pondweed**

Locally common in the R. Boyne, often as dense beds, from Derrindaly Bridge above Trim to Ballinter Bridge above Navan, also upstream of Obelisk Bridge; rarely in the Boyne Canal. Both parents are widespread in the R. Boyne. Elsewhere, a shallow water variant is recorded from a sheltered bay at Lough Bane.

First record: Boyne Canal at Roughgrange O0171, 1989 (MN **CGE**, det. Preston).

Distribution: N57, 75, 85, 86; O(07).

Potamogeton alpinus Balb. **Red Pondweed**

Localised and rare. Its single Meath site at Ervey Lough, within the drumlin belt of N Meath, is on the fringe of its predominantly northern distribution in Ireland.

First record: common in shallow water over silty grey soil on the S shore of Ervey Lough N7693, 2018 (MN, det. Preston).

Distribution: N79.

Potamogeton praelongus Wulfen **Long-stalked Pondweed**

Localised and uncommon. Standing and smooth-flowing deep waters of the Boyne and Royal canals.

First record: Navan, [Boyne] canal 1879 (CB MANCH & BM, det. Dandy).

Distribution: N64, (86), (97).

Potamogeton perfoliatus L. Perfoliate Pondweed

Locally common. Permanent water bodies of moderate depth. Widespread in the R. Boyne and its tributary the R. Deel; also present in the Boyne and Royal canals, the inter-drumlin lakes of N Meath and the marl-rich lakes of NW Meath.

First record: plentiful in the [Boyne] canal near Navan, growing near the Corn Mill 1868 (CB MANCH, det. Dandy & Taylor).

Distribution: N48, 64, (65), 75, 79, 85-7, 89, 97; O07.

Potamogeton obtusifolius Mert. & W.D.J. Koch Blunt-leaved Pondweed

Localised and uncommon. Shallow to moderately deep water of lakes within the drumlin belt of N Meath; also in the artificial lake on the R. Blackwater at Headford Bridge, which waters originate within the drumlin belt of Co. Cavan.

First record(s): Whitewood Lough 1897 (RLP DBN, fide Bennett, conf. Dandy); 1897 (Praeger 1901).

Distribution: N77, 78, (79), 89.

Potamogeton pusillus L. Lesser Pondweed

Localised and occasional. Standing water of lakes and ponds, both base-rich and base-poor, in shallow to moderate depth. Records under the name *P. pusillus* originally encompassed the two taxa now known as *P. pusillus* and *P. berchtoldii*. The importance of stipule morphology in distinguishing between the two taxa was first recognised by Hagström (1916), the correct nomenclature subsequently established by Dandy and Taylor (1938). Records which predate 1938 should only be accepted if supported by expertly determined specimens (Preston 1995).

First record: water-filled rusty skip at disused quarry c.2km SW of Donore O0470, 1991 (CDP & MN CGE, det. Preston). [There are no traceable specimens to clarify Praeger's earlier records from the bog 4 miles ENE of Athboy 1896 (RLP-Lond. Cat.), Navan & westward 1896 (RLP-Lond. Cat.) and H22 (Praeger 1901).]

Distribution: N48, 76, 78, 89; O(07).

Potamogeton berchtoldii Fieber Small Pondweed

Widespread and occasional, often occurring in quantity. Standing and smooth-flowing waters, both base-rich and base-poor. Lakes, ponds and canals; slow-flowing sections of rivers, streams and ditches.

First record: Beau Parc [on R. Boyne] 1957 (DMcC RNG & SLBI, det. Dandy & Taylor).

Distribution: N57, (74), (75), 78, 84-7, 89, 94, (97), 98; O(05-7).

Potamogeton crispus L. Curled Pondweed

Widespread and common. Rivers and streams; lakes; canals and deep ditches.

First record(s): Bective [on R. Boyne] 1896 (RLP-Lond. Cat.); H22 (Praeger 1901).

Distribution: N(48), (54), (57), 58, 64, (65), (74-7), 78, 79, 84, (85), 86, (87), 88, (89), (96), 97, (98); O05, 06, 07, (17).

Stuckenia filiformis (Pers.) Börner Slender-leaved Pondweed

Localised and rare. Recorded from NW Meath at White [= Annagh] Lough and Lough Sheelin, both sites on the margin of its predominately northwestern distribution in

Ireland. It occurs in shallow water of these base-rich lakes, with plants exposed in the drawdown zone during dry summers.

First record: (as *Potamogeton filiformis*) White Lough N5073 & N5173, 2010 (EPA).

Distribution: N48, 57.

Stuckenia pectinata (L.) Börner **Fennel Pondweed**

Localised and uncommon. Standing and smooth-flowing nutrient-rich waters. Inter-drumlin lakes in N Meath; uncommon in the Royal Canal; rare elsewhere.

First record: (as *Potamogeton pectinatus*) Laytown-BGX 14/22, 1957 (DMcC).

Distribution: N(64), (77), 78, 88, (89); BGX-14/22.

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Deep diving Water-cress

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In 2007 I was contracted by Meath County Council to survey the underwater vegetation of Lough Bane on the Meath/Westmeath border. This marl lake had very clear water, fed by underwater springs, with many charophyte species, some growing to a depth of 8-9m. One spring along the southern shore emerged through loose cobbles and gravel between 3 and 5 m below the surface. There were no charophytes present, instead bryophytes dominated, along with a very strange and unrecognizable plant which I collected (I was surveying by snorkelling with a friend providing boat cover). It resembled no submerged macrophyte described in any standard key, had no flowers and strange stalked entire translucent leaves with small rootlets at each node. Dejected, I dismissed the specimen as some unusual aberration.

Subsequently I became very involved in describing the vegetation of marl lakes along with my colleagues Paul Murphy and Jim Ryan, working mainly for the National Parks and Wildlife Service. In 2018 we resurveyed Lough Bane and revisited the underwater spring and as before, the peculiar plant was still growing at 3-5 m amongst different bryophytes. We gathered some material which I placed in a small tank on a north facing window. Over the winter of 2018 it gradually revealed its true nature by first developing opaque pinnate leaves and then erect stems. At this point we guessed it was a crucifer and very likely a water-cress. The following summer it was large enough to be placed in a newly established small outdoor pond; where it grew rapidly but produced no flowers. In 2020 a possible flowering stem aborted. In summer 2021 it finally flowered and fruited, revealing itself to be the rather widespread species *Nasturtium microphyllum* or Narrow-fruited Water-cress.

While the plant is widespread, its habitat is another matter. I have never seen any species of water-cress growing at such a depth (3-5m), nor so completely altering its form or habit. There are interesting accounts of experimentally growing the species under water but no flora I know describes the species as a submerged aquatic, certainly not at 3-5 m. The small population around the submerged spring appears to be a minimum of 10 years old and possibly much older; how it became established is a mystery but some form of vegetative reproduction (stem fragments?) must occur to allow it to persist. The chemical environment of the spring is probably different from the lake itself, with higher CO₂ levels and hence a lower pH, thus accounting for bryophytes replacing charophytes and possibly higher concentrations of nitrogen and phosphorus. Whether other submerged populations of water-cress occur, remains to be seen, but encountering the existing population proves how fieldwork is always full of surprises.

Herbarium specimens both of the submerged plant and the on-grown flowering specimen are lodged in DBN.

The curious incidence of the parasites in the woods

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I have always had a fascination for things that disappear. The capricious behaviour of turloughs continues to intrigue me. But I'm also captivated by plants that seem not to reappear each year in the same place. *Lathraea squamaria* (Toothwort) is one of them and *Hypopitys monotropa* (Yellow Bird's-nest) is another. Curiously, *L. squamaria* is on the front cover of our recent January 2023 BSBI News – and *H. monotropa* fronted the September 2022 issue. Are they making a come-back?

***Lathraea squamaria* (Toothwort)**

Spurred on last year by my partner Nick Scott finding a new spot for toothwort in the Clarinbridge woods, followed by Hannah Mulcahy telling me of another one elsewhere in those woods, I thought, 'well it's fairly common in SE Galway (**H15**), so this is no surprise'. But on consulting the BSBI database (DDB) (Botanical Society of Britain and Ireland, 2023), I found that about two-thirds of the nine or so records in **H15** were in Coole-Garryland National Nature Reserve, where I had first seen it with Cilian Roden in the 1990s. Therefore it appeared not to be as widespread as I thought, or quite possibly, my recording efforts were insufficient.

A species of 'good soils', 'locally common in some limestone areas' (Clapham, Tutin & Moore, 1989), it does not seem to occur on acid soils. It is virtually absent from the VCs (vice-counties) along the Atlantic coast from Donegal to West Cork and west of Loughs Mask and Conn in Mayo (Botanical Society of Britain and Ireland, 2023). In West Galway, it turns up in woods on limestone around Lough Corrib; the only record further west is on the Hill of Doon, where it coincides with a band of slightly basic Lakes Marble running across the hill (Morris *et al.*, 1995). Praeger scarcely mentions it in *The Botanist in Ireland* (Praeger, 1934) but does note that in Killarney, it is found in 'woods on the limestone'. In fact, the only records for Kerry are from Ross Island on Lough Leane and around Kenmare.

The idea that it is 'rather rare' in Ireland (Moore & More, 1866) is perhaps also due to its early appearance in the spring, before botanists start recording in earnest. In the first Atlas (Perring & Walters, 1962), it was shown not to have been found since 1930 in 34 of the 47 hectads (10 km x 10 km) where it was recorded in Ireland. The 13 hectads where it was re-found were in the east and north-east of Ireland, which may explain Clapham Tutin & Moore (1989)'s comment that it is 'perhaps now only in the east' of Ireland. Yet a study of all DDB records for Ireland reveals a bigger, newer picture. Records are now widespread and the majority are post-2000. Indeed, over 70 records have come in for Ireland since December 2019! Is toothwort spreading, flowering more often, or are we out and about earlier in the season? Recording effort has certainly increased in recent decades and records are now mostly at a finer scale.

Because I have found toothwort in re-planted woods, sometimes on sycamore *Acer pseudoplatanus* or beech *Fagus sylvatica*, I wondered if it was truly native to Ireland. But I was not familiar enough with it in SE Galway, let alone in Ireland, to come to any conclusion.

So in spring 2022, I set about re-finding all the toothwort records for **H15** in DDB as well as some vaguer records in old floras. The first outing, with the Galway group, was an attempt to find a record noted in *Cybele Hibernica* (Moore and More, 1866) as 'near

Ballinasloe'. The only woods even at that time seem to be in the Garbally estate. But we failed to find it and a return visit to the wood along the esker, especially the hazel wood on the easternmost part, was without success.

Then I searched for a 1997 record under sycamore in the woods near Labane that had eluded me in subsequent surveys. A delay in meeting Nick meant that I thoroughly searched every tree base in the region of where I remembered finding it – and finally found a veteran sycamore, toppled over but still alive -and there, on the up-ended base and round the tree, spreading up to 2 m away, were 48 spikes! Because I had searched every nearby tree and further afield and because Nick and I had previously recorded the length of the wood keeping toothwort in mind, I am fairly confident that the species is certainly very elusive and rare in those woods. It is odd that it does not seem to occur on the locally frequent native ash or hazel.

At Coole-Garryland National Nature Reserve, there were six records. I did not re-find two sites in Garryland, with no evident reason for its 'disappearance', but had one triumph: I found it at the exact spot we found underground scaly rhizomes on a 3rd-year excursion in *c.* October 2012, then possibly disturbed by badgers following the narrow path. The path has all but gone (windthrow disrupts access in these woods), but the toothwort persists (see back cover). A new find nearby on an old hazel made up for the two 'lost' sites. In Coole Park, one or more sites may have lost toothwort populations through path widening and reinforcing with gravel. Another record (2017) by Aine O'Loughlin under beech was not re-found.

In Clarinbridge woods, at Kilcornan, we turned up several patches. The one under beech where we found at least 20 spikes under several trees in 2021, had only two spikes in 2022, confirming that sometimes spikes may not emerge at known sites and supporting the plant's elusive reputation. Further south, on the lower slopes of the Slieve Aughty Mountains, we re-found a record by Cilian Roden on two old sycamores on the bank of the Owendalulleegh River across from Gortacarnaun Wood and later Frank Farrell found it on the opposite bank and further upriver at Lahardaun Woods. There, it occurs only on the banks of the fast-flowing flashy river or its tributary.

Since hazel scrub is widespread in the Burren, Co. Clare (H9), it is surprising that it has not been more widely recorded there, possibly due to the extensive, rough terrain. About five of the *c.* nine records for Co. Clare are in the Burren. It may simply be uncommon, even in extensive hazel woods. The hazel wood next to Glencurran Cave (Glenroe), where it was first noted by Eamonn Twomey, was spectacular for the number of trees we found to be infected: 88 spikes were found on 11 hazel trees. I did not attempt to locate it at the other Co. Clare sites, where two are recorded on hazel.

Summarising my 2022 records (Table 1); the host was a non-native tree at three of the 11 sites visited; one beech and two sycamore (2 sycamore trees at Gortacarnaun N). Though recorded under beech, we only found it under wych elm and hazel at Coole Park. Thus, at the majority of the sites, toothwort was found on native trees; ash, wych elm or hazel.

Table 1. Sites visited by the author in 2022 where toothwort was found. Records for a single tree unless specified (Recorders: myself, Nick Scott and Áine O’Loughlin)

Site	Vice-county	Grid reference	Date	No. spikes	Common name	Scientific name	Native Y/ N	Recorders	Notes
Clarinbridge East	H15	M419620	15th April 2022	2	Beech	Fagus sylvatica	N	MSS & NES	
Labane woods	H15	M463211	24th April 2022	48	Sycamore	Acer pseudoplatanus	N	MSS	
Gortacarnaun north	H15	R505498	10th May 2022	95	Sycamore	Acer pseudoplatanus	N	MSS	
Gortacarnaun north	H15	R505198	10th May 2022	14	Sycamore	Acer pseudoplatanus	N	MSS	
Kilcornan Woods, Clarinbridge	H15	M423196	15th April 2022	19	Ash	Fraxinus excelsior	Y	MSS	
Kilcornan Woods, Clarinbridge	H15	M423195	15th April 2022	11	Wych elm	Ulmus glabra	Y	MSS	
Garryland S	H15	M411503	7th May 2022	40	Hazel	Corylus avellana	Y	MSS	
Garryland S	H15	M412703	7th May 2022	20	Hazel	Corylus avellana	Y	MSS	
Coole Park	H15	M440104	7th May 2022	22	Wych elm	Ulmus glabra	Y	MSS & Á O’L	Laurel nearby
Coole Park	H15	M438004	28th May 2022	102	Wych elm	Ulmus glabra	Y	MSS & Á O’L	Huge tree; site: 5m x 1m
Glencurrán Cave wood	H9	R274964	15th May 2022	105	Hazel	Corylus avellana	Y	MSS & NES	On 11 trees in c. 15m x 15m

Widening the study, a quick glance at county floras lead to more information (full references for each flora are at the end), summarised here (clockwise from Fermanagh):

Fermanagh: Fairly widespread in estates and natural deciduous woodland. On hazel but in estates, often on laurel, sometimes lime (R. Forbes, R. Northridge pers. comm.)

Tyrone: Occasional in E & SE, very rare elsewhere ‘on a variety of plants’, in one estate frequent under laurel

NE Ireland: In Co. Down occurs mostly in estates; in Antrim, in many glens; occasionally noted from riversides. Seen on a wide range of hosts; hazel, plum, sycamore, beech, rhododendron, horse-chestnut, Lawson’s cypress, Portuguese laurel, cotoneaster, lime and a hybrid poplar (P. Hackney, pers. comm.)

Monaghan: Rare in dense to more open deciduous woodlands on basic soils, particularly in old hazel coppices – this species has only been found to parasitise hazel in the county to date

Cavan: Rare; on *Prunus* (sic) and poplar near the river

Dublin: Rare. In estates, sometimes by path or river. On elm, ash, hazel, beech, Portuguese laurel and horse-chestnut

Wicklow: Woods & thickets, some estates. On elm, hazel, laurel, ‘etc’

Wexford: Rare

Waterford: Rare; in an estate and on river-banks. On hazel, cherry laurel

Carlow: Rare

Cork: Local on limestone, Mid- & E Cork

Kerry: Very rare and local. On hazel, beech, ‘etc’

Limerick: Rare; in hazel woods & estate broadleaved woods. On hazel, horse-chestnut, cherry laurel, sycamore, poplar beside open water

Connemara and the Burren: Woods, very rare

A number of points emerge from this. It grows on many more non-native species than native; it is frequent in estates, which are likely to have more planted, alien, trees; it is often noted as beside rivers or open water. I also regularly found it next to paths. Rivers and paths provide disturbance and it may be that toothwort finds it easier to infect a host if its roots are slightly damaged. The slightly more alkaline river-bank soil in an otherwise acid environment may contribute to its presence along the Owendallulleegh River, as well as to

the scouring and possible dispersal effect of water. We once found it on the eastern shore of Lough Corrib where it was striking how it seemed to stretch along the ‘tideline’ (I did not note the host(s) at that time, probably hazel), suggesting a similar water-driven effect there. This seems to be also the case for its alien relative *L. clandestina* (FitzGerald, 2023). Toothwort seeds are said to be spread by ants (they have an oil-body appendage, or elaiosome; Forbes & Northridge, 2012), but there must be other factors involved, as surely it would be more widespread within a wood otherwise.

However, what is most striking is the listing of thirteen hosts, of which only ash, hazel and wych elm and plum/*Prunus* are native. Consulting some of the British floras (e.g. Clapham *et al.*, 1989; Preston *et al.*, 2002; Stace, 2019) only ash, hazel and elm are mentioned as hosts; in *Flora Europaea* (Webb, 1972) alder, hazel and beech are listed; my various French floras do not mention toothwort hosts, but the Flora of the Armorican peninsula lists elm, hazel, maple, ash, ivy, ‘etc’ as hosts (des Abbayes *et al.*, 1971). Is its widespread occurrence on roots of exotic species unique to Ireland, or simply not noted on these species in other floras? Perhaps toothwort was brought to Ireland with the importation of these exotic ornamental trees, hence its frequent occurrence in estates, but since I found nowhere where any exotics are listed as hosts to toothwort, it is both unlikely and perplexing. It may of course have spread naturally to the exotics from native hosts. It would be of interest if the tree(s) it is found under were systematically noted in future recording, both in Britain and in Ireland.

***Hypopitys monotropa* (Yellow Bird's-nest)**

Another capricious species, yellow bird’s-nest was only known to me in **H15** from Coole-Garryland, where it appeared regularly under a very large beech tree at Coole and I once found a withered spike in March in Garryland, confirming a 1979 record by John Cross for Garryland (Webb & Scannell, 1983). But I had not seen it elsewhere in SE Galway.

A mycoheterotrophic parasite on the genus *Tricholoma* (Rumsey, 2023), it is both rare and erratic, since presumably it depends on the presence of that fungus to survive. But *Tricholoma* is widespread and the fact that different species of the fungus associate with broadleaves or conifers can explain why *Hypopitys* can occur equally under conifers or broadleaves. Known from under hazel, beech, pine and *Salix repens* (Rumsey, 2023), I have only found it under beech in SE Galway. And here is an extraordinary story; Áine Dillon told me in August 2020 that she had found *Hypopitys* in Castletaylor. The only record in DDb (Botanical Society of Britain and Ireland, 2023) for Castletaylor seems to be by A.G. More in 1855 (under beech; Colgan & Scully, 1898); no-one had seen it there since! A lockdown bicycle trip confirmed it, growing under beech trees that line the road, giving it the local name of the Dark Road. We also found another patch further along the same tree-line. I have returned to record it in 2021 and 2022 and it seems to appear and disappear, so far at four different spots along the Dark Road. I have not yet found it in the main woods.

Áine O’Loughlin knew well the single station under the beech tree at Coole but we failed to re-find it recently. So I was very interested to hear in July that she’d found a different spot for *Hypopitys* some 200 m from that beech tree. A few visits yielded a count of nearly 80 spikes in a 4 m long stretch by a path under beech trees (see Page 44). As it is near a car park, it is very surprising that it was missed until last year, but its extent suggests it has been there for some time. Jenni McGuire, who had heard of and seen Áine’s

discovery, then found 84 spikes under beech in Lough Cutra Demesne, south of Gort. So is the species becoming more common, are we looking out for it more, or has some aspect of climate change encouraged it to produce spikes more often? Its sudden discovery in several brownfield sites in Scotland (Milne, 2022) suggests it is more versatile than we supposed. It remains rare, however, and is listed as Near Threatened on the Irish Red List, due to a ‘Decline in Area of Occupancy’ and is Protected in Northern Ireland (Wyse Jackson *et al.*, 2016). There are two subspecies, as yet to be determined fully, so further recording may yield interesting results.

Acknowledgements

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Vice-county Reports

Recording in Leitrim (H29) 2022

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Most Leitrim recording for 2022 took place during the first half of the year, though there were a few outings in September and October. Over 5,000 records were added to the database mostly from monads with few or no previous records. Some of the more interesting finds are outlined below.

Five people (Aoife Delaney, Aisling Blackburn, Sandie McCanney, Andy King and I) took part in a New Year Plant Hunt on January 2nd meeting at Dromod Quay on the River Shannon. We saw 27 species in flower including 3 grasses, one sedge and one tree. *Saxifraga tridactylites* (Rue-leaved Saxifrage) and *Sagina apetala* (Annual Pearlwort) were new to the Dromod area.

On January 9th I saw *Miscanthus sinensis* (Chinese Silver Grass) by a bog track near Clifffony. A new species for Leitrim but possibly dumped there.

On February 23rd a few white-flowered *Centaureum erythraea* (Common Centaury) were seen on a forest track between Glenfarne and Kiltyclogher. Apart from the flower colour it is unusual to see this species in flower in February!

On March 28th I got a third Leitrim record for *Epilobium pedunculare* (Rockery Willowherb) in a field south west of Benbo.

On April 9th a third Leitrim sighting of *Soleirolia soleirolii* (Mind-your-own-business) on a ruined cottage in Glenfarne. The only other Leitrim records are from Tullaghan and Kinlough.

In April, Nuala McNulty found a new hectad site for *Lathraea squamaria* (Toothwort) by a wooded stream bank between Glenfarne and Kiltyclogher. On April 11th, Patricia McHugh and I met up with Nuala to collect records from the monad G9339 and got 65 taxa including the Toothwort and also plentiful *Ranunculus auricomus* (Goldilocks Buttercup) in a new hectad.

On June 12th I recorded the Cam Lough monad H1603 near Cloone and got a new hectad site for *Carex pallescens* (Pale Sedge). Although there are several recent Leitrim records for this uncommon sedge, there are no Sligo sightings since 1996 (Slish Wood).

Other notable species seen near Cam Lough on that day were *Catabrosa aquatica* (Whorl-grass) & *Erophila glabrescens* (Glabrous Whitlowgrass).

On June 19th I met up with Bridget Keehan at Eden Rossinver with kind permission of the land owner Rod Alston who accompanied us in the search for *Pseudorchis albida* (Small-white Orchid). The orchid is known from the site but we didn't find any today. There were plenty of Butterfly Orchids (*Platanthera* spp.) at the site and interestingly an orchid that keyed out as *Dactylorhiza traunsteinerioides* (Narrow-leaved Marsh-orchid). Bridget had never seen the Small White Orchid but I showed it to her on the slopes of Kesh (Co. Sligo) on the following Saturday when we saw over twenty still in bloom. Another notable find at Eden was *Carex pallescens* (Pale Sedge) on the track and in the adjacent woods. The sedge was plentiful here in a new site.

On June 22nd I got records from the north side of Lough Nahoo near Dromahair (where several nice species occur) and found some *Carex aquatilis* (Water Sedge) in a new hectad site. By the adjacent roadside was *Galium album* (Hedge Bedstraw) in a new hectad site. This Bedstraw which is not believed to be native in Ireland is very rarely seen in Leitrim or Sligo.

Finally on July 12th I found yet another new site of *Carex pallescens* (Pale Sedge) on the eastern side of Lough Allen.

Recording in Sligo (H28) 2022

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In 2022 I took on the role of VCR for Co. Sligo and collected records there in every month of the year (over 19,000 in total). On many of the outings I was accompanied by Patricia McHugh. Others who came on one or more outings were; Sandie McCanney, Mary McCormack, Noel Raftery, Julie Bombule, Ciara Draper, John Mark Dick, Andy King, Bridget Keehan, Paul Green (BSBI Irish Officer and VCR for Co. Wexford **H12**) and Pat Lenihan from Dublin. On most of the recording sessions, monads with few or no previous records were selected over a wide area of the county. New hectad sites were found for many species. These included *Hypericum humifusum* (Trailing St John's-wort), *Erophila glabrescens* (Glabrous Whitlowgrass), *Veronica hederifolia* (Ivy-leaved Speedwell), *Ranunculus penicillatus* (Stream Water-crowfoot), *Dryopteris aemula* (Hay-scented Buckler-fern), *Avenula pubescens* (Downy Oat-grass) (the last two near Culleens in West Sligo), *Aphanes arvensis* (Parsley-piert), *Scutellaria galericulata* (Skullcap), *Ranunculus trichophyllus* (Thread-leaved Water-crowfoot), *Samolus valerandi* (Brookweed), *Honckenya peploides* (Sea Sandwort) *Zanichellia palustris* (Horned Pondweed), *Plantago maritima* (Sea Plantain) (the last species inland), *Catapodium marinum* (Sea Fern-grass), *Catapodium rigidum* (Fern-grass), *Symphytum officinale* (Common Comfrey), *Eleocharis quinqueflora* (Few-flowered Spike-rush), *Stuckenia filiformis* (Slender-leaved Pondweed), *Galeopsis speciosa* (Large-flowered Hemp-nettle), *Gymnadenia conopsea* (Fragrant

Orchid) (see page 46), *Potamogeton coloratus* (Fen Pondweed), *Galium odoratum* (Woodruff), *Catabrosa aquatica* (Whorl-grass), *Phleum bertolonii* (Smaller Cat's-tail) and *Utricularia minor* (Lesser Bladderwort), amongst several others. Many of those were seen in the more western parts of the county from the coast to the lower slopes of the Ox Mountains. In addition, *Trifolium medium* (Zigzag Clover) was seen for the first time north of Sligo town and the Garavogue River (see Page 84). A late season find was a fourth Sligo site for *Epilobium pedunculare* (Rockery Willowherb).

In Late April Paul Green visited Sligo and we met at Mullaghmore to check out a record for *Viola lutea* (Mountain Pansy) in the Bunduff dunes. The record had only a monad grid reference. A good search found only *Viola tricolor* subsp. *curtisii* (Dune Pansy). We also saw *Taraxacum webbiai* (Webb's Dandelion) so a useful update for that species. The record for *Viola lutea* (August 2000) therefore cannot be validated and anyway the sighting is far outside the known Irish range for that species.

Early in the year the non-native *Drabella muralis* (Wall Whitlowgrass) was seen at two new sites north of Sligo town (one of them first seen by Mary McCormack in 2021). This species was first recorded in Sligo (town) in 2013 so it seems to be increasing in the county.

In May I climbed Keash Mountain to try and relocate *Neotinea maculata* (Dense-flowered Orchid) without success as at the time I didn't have a precise grid reference for the site. The Orchid was first found on this mountain by Laszlo Kenderesi in May 2019 and was the first Sligo record. On the day I saw some *Asplenium viride* (Green Spleenwort) and this was the first sighting on Keash for at least 60 years. Also, this year Noel Raftery saw *Neotinea maculata* on Knocknarea where it was first found in May 2020.

In June Bridget Keehan and I visited the site for *Pseudorchis albida* (Small-white Orchid) at Treanmore on the south east side of Keash. This is one of the best sites for the rare orchid nationally as I counted over 100 flowering spikes there in 2011. In recent years the numbers became much reduced and it was hard to find half a dozen. Happily, Bridget and I counted over 20 on what was a very wet morning and given time and better weather we would certainly have seen more.

On June 28th I got records from the Carrowmore limestone uplands near Geevagh. This area has several uncommon species but the best find of the day was a good colony of *Carex canescens* (White Sedge) in a marshy area. This sedge is decidedly uncommon in Sligo and Leitrim and today's sighting was in fact my first time to see it in Sligo. Only an old un-localised record for the hectad G82. A few days later Bridget Keehan visited the site and it was her first time to see the sedge.

In mid-August I saw a nice colony of *Gentianella campestris* (Field Gentian) by the west shore of Lough Talt (see back cover). The last time it was recorded by Lough Talt was in 1987.

In September Sandie McCanney found a flowering plant of *Nicandra physalodes* (Apple-of-Peru) in her garden. She told me it was not planted or sown there. Perhaps introduced with soil. I would regard it as a garden weed though an exotic one.

A few further highlights of the Sligo recording year are outlined below.

In March, Patricia McHugh and I visited the site for *Adiantum capillus veneris* (Maidenhair Fern) by the Dunneill River below Dromore west. The fine colony was in good

condition. The Fern was first recorded there in 1891 and more recently recorded by the late Don Cotton in 2014.

Perhaps the highlight of the year for me was visiting the site for *Saxifraga hirculus* (Marsh Saxifrage) in the Ox Mountains south of Dromore West. There were two visits. Firstly, Patricia McHugh and I went to one of the flushes where the Saxifrage is known on July 22nd. We found many rosettes, a few with open flowers. On August 5th, Patricia and I returned to the site and this time we were joined by Pat Lenihan from Dublin who had never seen the Saxifrage before. We got records from two of the 3 flushes where the Saxifrage is known (first recorded in June 2012). We were rewarded by many plants of the Saxifrage in flower (see back of front cover). In addition, the site has several other locally uncommon or rare species; notably; *Carex diandra* (Lesser Tussock-sedge), *Vaccinium oxycoccos* (Cranberry), *Carex limosa* (Bog Sedge), *Carex dioica* (Dioecious Sedge) & *Selaginella selaginoides* (Lesser Clubmoss). These were accompanied by other less rare but nice species such as *Schoenus nigricans* (Black Bog-rush), *Pedicularis palustris* (Marsh Lousewort), *Sagina nodosa* (Knotted Pearlwort), *Juncus subnodulosus* (Blunt-flowered Rush) & *Pinguicula vulgaris* (Common Butterwort). Most of these must have been seen at the site in 2012 but were not entered into the database until I put them in this year. We were pleased to find that the populations of the Saxifrage are doing well at their Sligo site and hopefully will continue to do so there.

Finally, I cannot conclude this article without mentioning the recording work of the late Don Cotton who collected over 20,000 Sligo records in 2019 alone. He made a good start on the under-recorded western parts of the county but declining health restricted his travels within the county in his last few years. Happily, some useful recording took place in that part of the county in 2022 which offers many nice habitats and species and may have been eclipsed somewhat in the past by the nationally famous sites in the Benbulbin range, and around Lough Gill.

Recording in Waterford (H6) 2022

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On the 14th April 2022 Ann (Trimble) and I met up with Cliona Byrne, BSBI, near Villierstown where she introduced us to the protocols of recording as a VCR. Somehow during the course of this outing, it became clear that Ann and I were going to become the new VCRs for County Waterford!

In our own neighbourhood (Moneygorm) before we became officially inducted into the role, we checked on various plants that we had found in the previous year. A single Northern Marsh-orchid *Dactylorhiza purpurella* (see Page 43) was a wonderful repeat of the record I had made from 2021, the identity of which was confirmed by Paul Green, a first for the county since 1975. Unfortunately, when we took Paddy Tobin and Mark Roper to look at it a few days later it had disappeared, perhaps knocked over or eaten by deer that

used the area as a main thoroughfare. Luckily we were still able to show Paddy and Mark the multitudinous plants of Lesser Twayblade *Neottia cordata* (see Page 84) that we had discovered within walking distance of our house the previous year too. We estimated that there were at least 300 individual plants in the spruce plantation that I personally remember being planted some 30 years previously. Other interesting plants in our immediate neighbourhood that we rediscovered from earlier outings were White Beak-sedge *Rhynchospora alba* (see Page 84), Meadow Thistle *Cirsium dissectum* and the Marsh Clubmoss *Lycopodiella inundata*, which Paul Green had found several years previously when I was showing him the unusual *Sorbus* × *liljeforsii* (*S. aucuparia* × *S. intermedia*) that I had initially noticed some 20 years previously and been mystified as to its identity (this particular *Sorbus* species record being only the second for Ireland, it felt important to check on its status). I also discovered another Whitebeam species, Common Whitebeam *Sorbus aria*, close to home to add to the local collection which also includes a record of Irish Whitebeam *Sorbus hibernica* less than 300m from our garden.

On the 26th June we met up with Dr. Una Fitzpatrick of the National Biodiversity Data Centre and Paul Green (on the wettest day of the summer!) to check on some of the rare plants in our own locality of Carrignagour which would require monitoring. A single Marsh Hawk's-beard *Crepis paludosa* was a nice find in the car park where we initially gathered and we also investigated the surrounding woods where Paul showed us Wood Fescue *Drymochloa sylvatica* and one of the few sites for Killarney Fern *Trichomanes speciosum* where there were actual fronds to be seen rather than the usual gametophyte stage which is the form found in many other sites. We then travelled to Villierstown where Paul again showed us Wood Fescue *Drymochloa sylvatica* and a not yet in flower Helleborine *Epipactis* species. It was during this excursion that Ann and I were introduced to Julie Larkin and from that meeting we asked her if she too would like to join us as a joint VCR. Thankfully she was up for it so hopefully between the three of us we might prove to cover the county adequately.

A few weeks after this trip, Ann and I stopped off at the site where Paul had shown us the Helleborine in an attempt to get an idea of how many plants might be in the vicinity. Luckily the first plant I found was in flower and I tentatively identified it as a Green-flowered Helleborine *Epipactis phyllanthes*. I took some photographs and sent them from my phone to Paul who confirmed the identity – a first site for county Waterford. A few weeks later, Ann, Julie and I went back to the area to see if we could get a definitive number on the individual plants within the site. We were confident of 48 plants which would imply a very well-established site for them, but we were a little concerned at how close to the road many of these individuals were growing.

In July, Ann and Julie went to check on various species and identified several sedges and Fir Clubmoss *Huperzia selago* at a site in the Comeragh Mountains. A Pink Water-speedwell *Veronica catenata* discovered by Mary Harris and Megan Morris by the River Blackwater between Lismore and Cappoquin in the same month was a good find.

Also that same month, we met Paul and others with two fern experts from the UK at the same place we had carried out the rare plant monitoring scheme earlier in June. Alison Evans and Roger Golding had extensive knowledge on ferns and had found several interesting specimens in our locality several years previously. They showed us a number of *Dryopteris* species, all of which were new to me.

On 28th August, Ann accompanied Paul Green into the Comeraghs once more on the hunt for Recurved Sandwort *Minuartia recurva* and Alpine Clubmoss *Diphasiastrum alpinum* both of which were successfully recorded after quite a long trek!

In September, Ann and Julie joined Paul and several other BSBI members on Tramore Backstrand for a training outing where the highlights were Eelgrass *Zostera* species, Glasswort *Salicornia* species, Orache *Atriplex* species, Beaked Tasselweed *Ruppia maritima* and Golden-samphire *Limbarda crithmoides*.

As this was our first year as VCRs, we felt we've been just getting used to our duties and have tentatively planned a few excursions for 2023.

Field meeting reports – 2022

Inishowen Peninsula, East Donegal (H34), 11th and 12th June 2022

From a habitat point of view, the Inishowen peninsula is quite a diverse corner of the country which boasts a diverse range of habitats and, in particular, a wide range of coastal habitats including shingle beaches, sea-cliffs, coastal heath and extensive sand-dune areas. The peninsula is known for a number of botanical rarities with a northern distribution such as *Mertensia maritima* (Oysterplant), *Bistorta vivipara* (Alpine Bistort) and *Draba incana* (Hoary Whitlowgrass), however, a number of previously recorded rarer species such as *Lycopodium clavatum* (Stag's-horn Clubmoss), *Pyrola media* (Intermediate Wintergreen) and *Equisetum pratense* (Shady Horsetail) have not been seen for well over 100 years. This is curious given the apparent abundance of suitable habitat in the peninsula for these species.

Over the past ten years or so the peninsula has received a boost of botanical recording effort, primarily in advance of the Atlas 2020 deadline, however it is likely that many more botanical rarities await finding with a modicum of effort and luck. The original plan for this field meeting had included a day at higher elevations on the trail of some of the aforementioned rarer upland species, however, the very showery and windy forecast put paid to those ambitions. Four people attended on both the Saturday and Sunday of the trip and this resulted in the recording of approximately 640 plant records from a total of six coastal locations. Some of the more notable finds are listed below:

Armoracia rusticana (Horse-radish) – Five well-established plants on open ground at Rockytown, Buncrana (C 351327). A very rare species in East Donegal with the only other known records located at the opposite (southern) end of Vice-County near Ballyshannon.

Carex laevigata (Smooth-stalked Sedge) – A few clumps noted along the north-eastern margins of Carndonagh Woods (C 456453). The species appears to be rare in Inishowen and this is the first post-1986 record for the peninsula.

Gunnera tinctoria (Giant Rhubarb) – A number of large plants in wet grassland south of the road at Knockglass, Malin Head (C 440 537). It is surprising that this appears to be the first record of the species on the Inishowen peninsula however it is possibly more widespread.

Juncus tenuis (Slender Rush) – Roadsides east of Dunree (C 297393). A relatively rare species in Inishowen which is associated with road and track verges. A new hectad record.

Neottia cordata (Lesser Twayblade) – Occasional under low, windshorn *Calluna vulgaris* (Heather) shrubs close to sea-level, along the Bunrana shore path (C 33143362). A new hectad record for a species which is probably under-recorded on the peninsula.

Saxifraga tridactylites (Rue-leaved Saxifrage) – Sparingly on the walls of Lag Chapel, Malin Head (C 42955292). This species has always been very rare in the north-west of Ireland and this location would appear to be the first record of the species on the peninsula.

Sherardia arvensis (Field Madder) – Occasional on short coastal grassland adjoining shingle beach, north-west of Five Fingers Strand, Malin (C 415537). A very rare species on the peninsula with only one other record in Inishowen from near Greencastle village.

As the weekend came to an end it was heartening to know that some of Inishowen's more elusive botanical records remain to be rediscovered. One such record is that of *Saxifraga spathularis* (St. Patricks's-cabbage) at Knockglass, Malin, last seen in the mid-1800's, which is possibly still hiding out on some relatively inaccessible rock outcrop overlooking Trawbeaga Bay. Roll on 2023.

John Conaghan

Book Reviews

Charles Frederick Ball: From Dublin's Botanic Gardens to the Killing Fields of Gallipoli

Brian Willan

The Liffey Press Ltd, Clontarf Road, Dublin, 2022; pp.xx + 188, with numerous illustrations; paperback, €16.95. ISBN 978-1-7397892-0-6

<https://theliffeypress.com/charles-frederick-ball-from-dublin-s-botanic-gardens-to-the-killing-fields-of-gallipoli-by-brian-willan.html>

This book is timely in its publication, as we approach the 109th anniversary of the beginning of World War I in August 1914, and indeed at a time when broadscale war wages once again in Europe in the 21st century.

The book is a brisk, enjoyable celebration of the life of a man who the Irish Times called "one of the best known botanists and horticulturists in Ireland" following his death in 1915.

Charles Frederick Ball, known as Fred, was born in Leicestershire in 1879 and the book begins with a brief description of his family and childhood, recounting Fred's natural talent as a sportsman and his early academic career in school.

Liked by many, it is here that we first get a glimpse of the nature of a man whose amiable character makes the book such a pleasant read.

By the time the story reaches Fred's burgeoning interest in plants, the book has hit its stride, and here it details his early apprenticeships and entrance into the much-esteemed Royal Botanic Gardens at Kew.

The telling of much of Fred's story is anchored with a wonderful variety of pictures from Fred's youth that slowly evolves into pictures of various plants, locations, and people of note as Fred's interest in botany fully blossoms (including, of particular curiosity, an early tree transplanting machine). A number of the photographs were taken by Fred himself.

Fred's time at Kew coincides with the growth of - as the author puts it - "the horticultural needs of empire" and showcases the blooming of both the study and business of plants during the late Victorian era. In doing so, it provides a lot of historical value for readers interested in what they can learn from this aspect of Fred's life.

Along the way, the book boasts quite an interesting cast of names from the era such as William Gumbleton, William Thistelton-Dyer, and the quite splendid George Curling Joad, brief mentions of whom add quite a lot of colour to these chapters of Fred's life. Although it must be mentioned that with so many new names and characters, it can be a little hard to keep track.

The historical insights we can glean from Fred's life have an Irish flavour too. During Fred's consideration for his first position in the Royal Botanic Gardens (now National Botanic Gardens) in Glasnevin, we are told of the Department of Agriculture's wish to fill the role with an Irish candidate. Such decisions to fill civil service positions were what the book calls a "sensitive matter" during a strange limbo for Irish politics.

Fred's time at Glasnevin is a resounding success and the connections and friends he makes at this time lead him to many far-flung places and on many extravagant, exotic trips, the highlight of which is best described as botanical travels with the King of Bulgaria.

Such tales really help foster an understanding of the nature of a man whose obvious passion, generosity, and expertise not only helped to grow the field in Ireland, but seems to have genuinely endeared him to all he met.

It is in his editorship of *Irish Gardening* and his famed plant breeding efforts (most notably the ornamental *Escallonia* hybrids, including the eponymous *Escallonia* 'C.F. Ball') that Fred's botanical legacy is the most concrete and enduring. The journal saw significant growth under Fred's watchful eye and became extremely influential at the time in Ireland and even elsewhere as a showcase for "what was being achieved across the Irish Sea".

Fred's life in Ireland is made complete when he meets the love of his life, Alice Lane, whom he marries in 1914. It is through her - and her familial connection to the author - that much of this information about Fred survives in notes and letters exchanged between the two.

Following the outbreak of war in 1914, Fred enlists in the Irish Fusiliers, and the final portion of the book is dedicated to the portion of Fred's life as a soldier. It describes his many friends in D Company, his ongoing dedication to his craft even on deployment, his continued charitable spirit, and ultimately the tragedy of his death in an era where many men were cut down cruelly in the prime of their lives.

All told, Fred's story is very touching, and, no matter the reader's background, seems to hold a wide appeal. It has a decent smattering of botanical and horticultural information for plant lovers; insight into an interesting and overlooked part of history for

the historically minded; and even a lively pace that means those from either background may still enjoy the portrayal of this extremely likeable, interesting, and influential figure in Irish botanical history.

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Captions for pages 39-42 (see page 5 for article relating to Plates 1-5b)

Plate 1. DSC4399. 19th October 2021. 4.38 MB (2 hips – L & D species phenotypes)

Hips: vertical section of L & D phenotypes; left: *R. tomentosa* – stylar channel long and narrow. (L phenotype); right: *R. sherardii* – stylar channel short and wide (D phenotype).

Plate 2. DSC4311. 25th September 2021. 4.72 MB (single ripe hip of *R. sherardii*)

Disarticulating, withered sepals borne on the fleshy hypanthial rim of the hip, their transverse sepal-scars clearly visible. (D phenotype).

Plate 3. DSC4009. 3rd September 2020. 4.69 MB (*R. tomentosa* infructescence)

Hips: *lacking* a terminal, fleshy, rim; their transverse sepal-scars borne at the level of the flat or shallow-domed disc.

Plate 4a. DSC4567. 16th August 2022. 4.90 MB (*Rosa vosagiaca* x *R. tomentosa*)

A hybrid new to the Irish flora; infructescence: 2 unripe subglobose hips, their sepals already having fallen; leaf-stipules red-flushed; leaf-rachides with *R. tomentosa* stipitate-glands; location: minor road hedgerow populations at Killamurren, East Cork.

Plate 4b. DSC4582. 16th August 2022. 3.70 MB (*Rosa vosagiaca* x *R. tomentosa*)

2 hips: their discs *concave*, the stylar orifice 1.2-1.4 mm in diameter and 1/4-1/3 the width of its disc (D/L phenotype); location: Killamurren, East Cork (H5, W82.85).

Plate 5a. DSC4545. 13th August 2022. 5.11 MB (2 hips of *R. tomentosa* x *R. x suberecta*)

A hybrid new to the Irish flora; infructescence branch below the unripe hips, displaying acicles inherited from its pollen parent, *R. x suberecta*; location: upper Glanmire village, East Cork (H5, W70.77).

Plate 5b. DSC4551. 13th August 2022. 5.31 MB (*R. tomentosa* x *R. x suberecta*)

Leaf of sterile shoot: leaflet shape, tooth shape, and rugosity of adaxial (upper) surface, are inherited *Rosa sherardii* features; location: upper Glanmire village, East Cork (H5, W7077); associated rose taxa: *R. tomentosa*, *R. sherardii* and *R. x suberecta*.

Captions for page 84 & back cover:

Plate 1. *Neottia cordata* (Lesser Twayblade) from a spruce plantation in Moneygorm, Co. Waterford (H6). Photo A. Malcolm © 2022.

Plate 2. *Senecio minimus* (Toothed Fireweed) plant established in corner by a wall at edge of urban pathway in Dun Laoghaire town centre, Co. Dublin (H21). Photo A. FitzGerald © 2022.

Plate 3. *Rhynchospora alba* (White Beak-sedge) from Moneygorm, Co. Waterford (H6). Photo A. Malcolm © 2022.

Plate 4. *Trifolium medium* (Zigzag Clover) near Rosses Point, Co. Sligo (H28). Photo E. Gaughan © 2022.

Plates 5. *Lathraea squamaria* (Toothwort) between ash & beech, near old track, Garryland, South-east Galway (H15), 7th May 2022. Photo M. Sheehy-Skeffington © 2022

Plates 6. *Gentianella campestris* (Field Gentian) at Lough Talt, Co. Sligo (H28). Photo E. Gaughan © 2022.

Plates 7. *Lathraea clandestina* (Purple Toothwort) by the River Tolka, Dublin City (H21). Photo A. FitzGerald © 2022.

Plates 8. *Spiranthes romanzoffiana* (Irish Lady's-tresses) at Lough Fea, Co. Tyrone (H36). Photo D. McNeill © 2022.

Plate 1 (p. 78)



Plate 2 (p. 29)



Plate 3 (p. 78)



Plate 4 (p. 76)



Plate 5 (p. 69)



Plate 6 (p. 76)



Plate 7 (p. 50)



Plate 8 (p. 17)

