THE WILDLIFE GARDEN AT THE NATURAL HISTORY MUSEUM: DEVELOPMENTS OF THE FLORA AND FAUNA UPDATE 2021-2022 – TWENTY-SEVEN YEARS OF SPECIES RECORDING

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Introduction

This article aims to report further developments to the Wildlife Garden habitats and presents a summary of species recorded since the last report (McCarter *et al*. 2021). In the period covered, a total of 79 additional species from nine groups were recorded, bringing the number of taxa known from the Wildlife Garden to approximately 3,422. These new species records are listed at the end of the paper.

Gardens update

There have been some notable changes to some of the Wildlife Garden habitats over the past year in preparation for the construction phase of the Urban Nature Project (UNP) in August 2022. The UNP is a major Natural History Museum project that will see the outdoor space of the Museum transformed into a welcoming, accessible and biologically diverse green space. New outdoor galleries will showcase the Museum's scientific research and provide a space for the public to learn about the diversity of life on Earth and how our planet has changed over time.

Most habitats in the Wildlife Garden will be protected and expanded in the new designs, with meadow and woodland extending into the Museum's west lawn and a re-laid and enlarged pond in the centre of the Garden. There will be numerous trees planted across the grounds including native Black Poplars *Populus nigra*, donated from Richmond Park, and a disease-resistant elm *Ulmus*, variety to be decided. A new learning activity centre, with classroom, laboratory and office space, will be built in the Wildlife Garden on the site of the current office.

The lowland heath habitat near the public entrance though, will not form part of the re-landscaped UNP gardens, and in November 2021 the heath was translocated in partnership with London Wildlife Trust (LWT) to an existing area of LWT-managed heath at Bramley Bank Nature Reserve in Croydon.

The Gardens will close to the public in August 2021 and re-open in summer 2023. You can find out more about the Urban Nature Project on the NHM website.

Monitoring and recording

All records made in the Wildlife Garden between 1995 and 2021 have now successfully

been uploaded to iRecord and are available to view on the iRecord website. At the time of writing, together with the new records that have been directly input into iRecord since 2021 this represents c. 55,000 records. For those interested in viewing or searching previous records from the Wildlife Garden, search for and join the iRecord activity 'NHM grounds recording'.

If previous Wildlife Garden recorders have questions about their publicly available records and iRecord, please contact the lead author.

Recording methods

Wildlife Garden staff and volunteers are continuing with the survey methodologies outlined by Sylvia Myers (McCarter *et al*. 2021). Bird surveys and light-trapping remain the most regular surveys, with moths and occasional by-catch identified with the help of museum curators. Butterfly transects, fixed-point Odonata survey and bee walks, piloted in 2021/2022, have continued and the intention is to register them with recording schemes after the Gardens' redevelopment is completed. Other surveying includes extensive newt surveys conducted between March and May for the second year running, and Malaise and pitfall trapping for UNP science. The results from these surveys will be published in a future London Naturalist.

VASCULAR PLANTS

Thorough plant surveys by Sylvia Myers throughout the Gardens in 2020 and 2021 revealed a number of additions to the list of plant species. Several of these were grasses that have likely been present in the Gardens for some time but previously missed, including Heath False-brome *Brachypodium pinnatum*, Bearded Couch *Elymus caninus* and Giant Fescue *Festuca gigantea*. There were also several other unexpected discoveries; Caucasian Crosswort *Phuopsis stylosa* was found on a green roof and Black Spleenwort *Asplenium adiantum-nigrum* was found by Sam Thomas growing on the east wing of the Waterhouse Building.

BRYOPHYTES

LEN ELLIS AND CAROLINE WARE

With the transformation of the NHM Wildlife Garden in progress, some habitats and therefore their mossy inhabitants, have been lost. *Dicranum scoparium*, *Campylopus introflexus* and *Hypnum jutlandicum* that dominated the bryophyte community of the heathland area have vanished along with their habitat. Similarly, the long dried-up stream across the chalkland area GO1 has lost *Leptodictyum riparium*, although this moss of water-margins survives elsewhere in the Garden.

Bryophyte communities in relatively undisturbed habitats in the Wildlife Garden have continued to develop naturally with some populations becoming more extensive and richer in species. The community along the chestnut fence (WO1), although all but losing the creeping shoots of the moss *Cryphaea heteromalla*, have gained thriving patches of the leafy liverworts *Frullania dilatata* and *Radula complanata*, while the damp soil of the fen and ditch near the edge of the Garden bordering the Cromwell Road now supports a mossy tuft of *Fissidens dubius*. The creeping moss *Calliergonella cuspidata* has almost formed a lawn over the stony area with the dinosaur footprints, and in the undisturbed Glade area (WO6), a carpet of the large moss *Plagiomnium undulatum* is thriving. Even the narrow crevices in the tiled pathways through the Garden support a population of the thallose liverwort *Lunularia cruciata*. The growth of individual thalli is restricted in this habitat, but nevertheless, the species is becoming more widespread. Also increasing its general presence in the Garden, mostly on soil, is the small, erect-stemmed moss *Didymodon insulanus*, which was once restricted to the waterfall area.

It will be interesting to observe how the various bryophyte communities will continue to adapt and evolve in the face of the dynamic transformation of their garden home.

BIRDS

Weekly bird walks on a transect including the whole grounds continued in 2022. Most common sightings are Blackbirds *Turdus merula*, Robins *Erithacus rubecula*, Blue Tits *Cyanistes caeruleus* and Great Tits *Parus major*. Large numbers of Redwings *Turdus iliacus* descended on the Gardens in February 2022 and a Great Spotted Woodpecker *Dendrocopos major* was spotted in the Gardens in March.

Two notable omissions from the bird records this year have been Long-tailed Tits *Aegithalos caudatus* which nested in 2020 and 2021 but not in 2022, and Moorhens *Gallinula chloropus* which have moved on after their nest box islands deteriorated. A new purpose-built Moorhen island will be included in the newly re-laid ponds in 2023.

DIPTERA

SAM THOMAS

Overall 28 new species of Diptera were recorded from the Gardens in the period since the last update. The majority of these were swept by the author. Of these two species are potentially uncommon, namely the muscid *Helina abdominalis* (pNationally Scarce) and the pipinculid *Eudorylas zermattensis* (Lower Risk; Nationally Scarce).

Continued Agromyzidae recording added four species, taking the Garden total for this family to 23. *Phytomyza origani* was recorded as a leaf mine on Wild Marjoram *Origanum vulgare*, while *Chromatomyia milii*, *Liriomyza*

Leucophora obtusa female. This fly is a kleptoparasite of solitary bees, including *Andrena fulva* and *A. nitida*, both of which have been recorded in the museum gardens. © Sam Thomas

ptarmicae and *Phytomyza plantaginis* were swept as adults.

Two Diptera species were added via iNaturalist by Antony Pintus, Science Educator in the Learning team, and verified by the relevant recording schemes. These were the hoverfly *Helophilus hybridus* and the satellite fly *Macronychia polyodon*. The latter of these is listed as pNationally Scarce and is a kleptoparasite in the nests of a range of Aculeate Hymenoptera such as *Pemphredon* species.

The distinctive large dolichopodid *Liancalus virens* was also added by Duncan Sivell. This is a common species that is often associated with water trickling over vertical surfaces.

HYMENOPTERA

SAM THOMAS

Seven new species of Hymenoptera were added in the period since the last update. Gavin Broad recorded the cuckoo wasp *Chrysis angustula*, a frequent species in the south.

The remaining six Hymenoptera additions were made by the author. These comprised five sawflies (Symphyta) and the common Diplazontinae ichneumonid *Syrphoctonus tarsatorius*, a parasitoid of hoverfly (Syrphidae) larvae. Leaf mines of the sawflies *Fenella nigrita* and *Metallus lanceolatus* were recorded on *Potentilla reptans* and *Geum urbanum* respectively, while the remaining three sawfly additions were swept as adults.

LEPIDOPTERA

DAVID LEES AND TOM MCCARTER

Light-trapping for moths is one of the Wildlife Garden's longest running and most regular surveys. A mercury-vapour Robinson trap (125W bulb) is put out as frequently as weather and staffing allows; 32 times since the last *London Naturalist* update, with the majority of traps set from March – October each year.

Over the past 27 years, a total of 593 Lepidoptera species have now been found. The most common species are Light Brown Apple Moth *Epiphyas postvittana*, followed by Large Yellow Underwing *Noctua pronuba*, Furness Dowd *Blastobasis adustella*, Common Marble *Celypha lacunana* and London Midget *Phyllonorycter platani*.

In the past year, 17 new moth species were recorded in the Wildlife Garden. These include Cypress-tip Moth *Argyresthia cupressella* (10/05/2022) an invasive leaf-mining species from North America that has been increasing from 1887 is now common on ornamental conifers, such as *Chamaecyparis*, *Cupressocyparis* and *Juniperus*, and a particularly beautiful vagrant, Dewick's Plusia *Macdunnoughia confusa* that was found on 22/07/2021 and from which we were able to rear a brood on nettles. The Spindle Knot-horn *Nephopterix angustella* also turned up as a singleton on 04/08/2021, a moth for which there are few records in the London area.

Dewick's Plusia *Macdunnoughia confusa*. © Sylvia Myers

The presence on 25/06/2021 of another introduction, from Europe, *Clepsis dumicolana*, a very distinctive tortricid moth, is also noteworthy. First detected on Ivy in Old Brompton Hospital in 2014, it has been becoming increasingly common in the Kensington-Fulham environs. *Pammene albuginana*, an inquiline on oak galls, is another interesting record (on 18/05/2022). The Plumed Fan-foot *Pechipogo plumigeralis*, often considered to be a rare migrant in the UK seems to be now established in the Wildlife Garden and surrounding area with the last record on 16/09/2021 (also photographed by David Lees on 22/09/2021 in Cornwall Gardens, SW7).

The Twenty-Plume Moth *Alucita hexadactyla*, first found on 23/04/2019, was recorded again on 01/04/2021. The Scarce Gold Conch *Phtheochroa schreibersiana* also found in 2019 was again found on 02/06/2021. The last species is known from only a handful of records in the home counties since 2010 until it started increasing in 2018, and likely feeds on Black Poplar but the host plant appears unreported for the UK.

Oak Processionary Moth *Thaumetopoea processionea*, previously recorded in the Gardens as adults found in the light trap, was recorded on 10/08/2021 and on 8 June 2022 in its larval stage. A much-publicised non-native species expanding since 2006, a distinctive webbing nest of Oak Processionary Moth was spotted high in the *Quercus robur* behind the Garden office. From the third larval instar onwards, Oak Processionary Moth caterpillars produce urticating hairs that can be irritant to human health. Given the public location of the tree close to the Darwin Centre, courtyard arborists were instructed to physically remove the nest.

COLEOPTERA

MAXWELL V.L. BARCLAY, MICHAEL F. GEISER AND KEITA MATSUMOTO

With ongoing global destruction and human modification of natural habitats, the importance of well-monitored urban nature sites becomes ever greater, to help us understand which components of natural ecosystems are able to survive and even thrive in and around large cities. The Natural History Museum Wildlife Garden is an excellent example of a regularly studied and varied representation of natural habitat in a major urban area and, because beetles are so diverse, a comparison of its beetle list with traditional sites in the countryside is informative.

The Wildlife Garden beetle list, which was published in 2016 (Barclay, in Ware *et al.* 2016) and updated regularly, now stands at 378 species in 49 families and continues to grow. On 14 June 2022 Maxwell V.L. Barclay, Michael F. Geiser and Keita Matsumoto spent around an hour beating and sweeping in the meadow areas on a warm day, and recorded 43 beetle species in 14 families, of which 29 were on the 2016 list, five were added in subsequent years, and nine were new for the Wildlife Garden list. The whole list has been uploaded to iRecord and specimens were also provided for the Natural History Museum's ongoing DNA sequencing projects, and many have been preserved in the NHM collection. The day was memorable for the large number of the longhorn beetle *Rutpela maculata* flying in the sunshine around flowers of Hogweed *Heracleum*

in the meadow. This large and beautiful beetle has a wood-feeding larva, and although already on the Garden list, none of us had seen it in such profusion here before.

Of the nine species recorded new for the Garden in June 2022, six were weevils (Curculionoidea): *Ceutorhynchus typhae* and *C. obstrictus* are common species associated with Brassicaceae, and *Protapion assimile*, *P. trifolii* and *Hypera nigrirostris* feed on Fabaceae, particularly clover. The tiny bark beetle *Scolytus pygmaeus* is associated with elm but a single specimen was collected by KM by sweeping grass. This is a recent arrival in Britain and still known from a handful of records. It was first collected in 2000 in Darenth, West Kent (Heal 2003). The Natural History Museum Collection has four specimens from Greater London as follows: Hampton, 2003, S. Cole; Merton, 2004, A.C. Galsworthy; Queen Mary Reservoir, 2006, R.G. Booth and Richmond Park, 2006, P.M. Hammond. Although there is no evidence of breeding in the Garden, these beetles fly strongly so it may have dispersed from Kensington Gardens. Another new record that is unlikely to be breeding in the Gardens but is probably using them as a source of nectar for the adults, is the Brown Carpet Beetle *Attagenus smirnovi* (Dermestidae); the species was described new to science in the 1970s from urban Moscow and its original distribution is uncertain. It is now widespread feeding on dust and animal matter in houses and public buildings in London and can be found in the public galleries of the NHM, where it is 'humorously' called 'Vodka Beetle' but can be a minor collection pest. The final species found new to the Garden, which also represents a first record of its family, was *Byturus ochraceus* (Byturidae), associated with Wood Avens *Geum urbanum* which grows around the meadow.

A species of some interest added to the Garden list in 2022 was the Alder Leaf Beetle *Agelastica alni* (Chrysomelidae), a beetle that is widespread in Europe, but was believed to be extinct in the UK with the last records from the New Forest in 1946 (Hyman 1992). In around 2004, it reappeared in Manchester and began to spread, and is now common, often hugely abundant. It is likely that the reappearance of this insect is a result of the introduction from Europe of more robust populations better suited to the climate and environment of modern Britain, a situation similar to the weevils *Magdalis barbirostris* and *Polydrusus formosus*, which were formerly considered very rare but are now common in urban habitats including the Wildlife Garden. *Agelastica alni* feeds as an adult and larva not only on Alder, but also on Hazel and a range of other plants. It was first found in the Wildlife Garden by Victor Heng with adults on 12 April and 21 May. Further adults were found by MVLB on 16 May and by Antony Pintus on 3 June. Larvae were noted on the Hazel trees near the pond on 14 June, providing evidence of breeding.

A single specimen of the soldier beetle *Malthinus flaveolus* (Cantharidae) was recorded on 26 May 2022 by MVLB near the Queen's Gate entrance, a new species for the Garden. Sylvia Myers also photographed *Dorytomus longimanus* (Curculionidae) on 16 February 2022; this large and attractive poplar catkin-feeding weevil has been recorded in the Garden, especially in Malaise traps, for several years since at least 2019, but was never formally included on a published list so is added here.

The following new Coleoptera records were added to the Wildlife Garden list in 2022.

Dermestidae – Museum Beetles
Attagenus smirnovi Zhantiev, 1977
Byturidae – Fruitworm Beetles
Byturus ochraceus (Scriba, 1790)
Cantharidae – Soldier Beetles
Malthinus flaveolus (Herbst, 1786)
Chrysomelidae – Leaf Beetles
Sphaeroderma testaceum (Fabricius, 1775)
Agelastica alni (Linnaeus, 1758)
Apionidae – Seed Weevils
Protapion assimile (Kirby, 1808)
Protapion trifolii (Linnaeus, 1768)
Curculionidae – True Weevils
Ceutorhynchus typhae (Herbst, 1784)
Ceutorhynchus obstrictus (Marsham, 1802)
Hypera nigrirostris (Fabricius, 1775)
Dorytomus longimanus (Forster, 1771)
Scolytus pygmaeus (Fabricius, 1787)

This brings the list of beetles known from the Garden to 390, and the list of families to 50, almost half of the 103 beetle families reported from Britain.

HEMIPTERA

MAXWELL V.L. BARCLAY

Three species of Hemiptera were added to the Wildlife Garden species list. Pine Woolly Aphid *Pineus pini* (Adelgidae) was found on Scots Pine on the old heath and identified by Paul Brown. Two groundbugs (Lygaeidae), *Drymus* (*Sylvadrymus*) *sylvaticus* and *Scolopostethus pictus* were identified by Sam Thomas in March 2022. The latter appears to be increasing in the UK and is periodically found overwintering in the Waterhouse Building during 'pest monitoring' although it is not a museum pest. Another bug of interest found inside the NHM building was a single overwintering female of the Brown Marmorated Shield Bug *Halyomorpha halys* (Stål) (Pentatomidae), collected on 18 October 2021 by Keita Matsumoto. This Asian species is now a global pest of horticulture and was reported new for Britain last year (Powell *et al*. 2021) based on several specimens, including one from the Wildlife Garden in August 2020 (McCarter *et al*. 2021). This is therefore the second specimen from the NHM site and the first found in the building itself.

SPIDERS AND HARVESTMEN

The first new spider record since 2018, *Centromerita concinna*, was recorded in October 2021 by volunteer spider recorder Tom Thomas.

Harvestmen are elusive in the Gardens, with only three records from 2009 and 2015 of *Dicranopalpus ramosus*. August 2021 saw two more records for the Gardens, with one juvenile female *Dicranopalpus ramosus* sensu stricto (post-2015) found in the light trap, and a deceased *Leiobunum rotundum* found between two pieces of plywood by the sheds in good enough condition to be identifiable and verified by the BAS Harvestmen Recording Scheme.

LIST OF SPECIES NEW TO THE WILDLIFE GARDEN

HEMIPTERA

Lygaeidae
1. *Drymus* (*Sylvadrymus*) *sylvaticus*
2. *Scolopostethus pictus*

Adelgidae
3. *Pineus pini*

COLEOPTERA

Dermestidae
4. *Attagenus smirnovi*

Byturidae
5. *Byturus ochraceus*

Cantharidae
6. *Malthinus flaveolus*

Chrysomelidae
7. *Sphaeroderma testaceum*
8. *Agelastica alni*

Apionidae
9. *Protapion assimile*
10. *Protapion trifolii*

Curculionidae
11. *Ceutorhynchus typhae*
12. *Ceutorhynchus obstrictus*
13. *Hypera nigrirostris*
14. *Dorytomus longimanus*
15. *Scolytus pygmaeus*

DIPTERA

Agromyzidae
16. *Chromatomyia milii*
17. *Phytomyza origani*
18. *Liriomyza ptarmicae*
19. *Phytomyza plantaginis*

Anthomyiidae
20. *Hydrophoria linogrisea*
21. *Anthomyia liturata*
22. *Anthomyia pluvialis*
23. *Delia platura*
24. *Anagnota bicolor*

Chamaemyiidae
25. *Chamaemyia polystigma*

Chloropidae
26. *Elachiptera tuberculifera*
27. *Trachysiphonella scutellata*
28. *Chlorops pumilionis*
29. *Meromyza femorata* sens. str. post-1960

Dolichopodidae
30. *Liancalus virens*
31. *Dolichopus griseipennis*

Lauxaniidae
32. *Sapromyza quadripunctata*

Limoniidae
33. *Epiphragma ocellare*

Muscidae
34. *Phaonia tuguriorum*
35. *Helina abdominalis*
36. *Coenosia agromyzina*

Pipunculidae
37. *Eudorylas zermattensis*

Polleniidae
38. *Pollenia angustigena*

Sarcophagidae
39. *Macronychia polyodon*

Syrphidae
40. *Helophilus hybridus*
41. *Melangyna umbellatarum*

Tachinidae
42. *Voria ruralis*
43. *Eriothrix rufomaculata*

HYMENOPTERA

Chrysididae
44. *Chrysis angustula*

Ichneumonidae
45. *Syrphoctonus tarsatorius*

Tenthredinidae
46. *Pristiphora monogyniae*
47. *Nematus lucidus*
48. *Claremontia alternipes*
49. *Fenella nigrita*
50. *Metallus lanceolatus*

LEPIDOPTERA

Argyresthiidae
51. *Argyresthia cupressella*

Crambidae
52. *Scoparia basistrigalis*

Depressariidae
53. *Agonopterix purpurea*

Drepanidae
54. *Tethea ocularis*

Nepticulidae
55. *Ectoedemia louisella*

Noctuidae
56. *Hadena perplexa*
57. *Macdunnoughia confusa*
58. *Dypterygia scabriuscula*
59. *Agrotis clavis*

Nolidae
60. *Nola confusalis*

Pyralidae
61. *Nephopterix angustella*

Tineidae
62. *Monopis obviella*

Tortricidae
63. *Pammene albuginana*
64. *Syndemis musculana*
65. *Hedya salicella*
66. *Gypsonoma sociana*
67. *Hedya pruniana*
68. *Clepsis dumicolana*

ARANEAE

Linyphiidae
69. *Centromerita concinna*

OPILIONES

Phalangiidae
70. *Leiobunum rotundum*

POLYPODIALES

Aspleniaceae
71. *Asplenium adiantum-nigrum*

DIPSACALES

Caprifoliaceae
72. *Lonicera japonica*

CARYOPHYLLALES

Caryophyllaceae
73. *Silene* x *hampeana* (= *S. latifolia* x *dioica*)

FABALES

Fabaceae
74. *Lathyrus sylvestris*

ASPARAGALES

Iridaceae
75. *Crocus tommasinianus*

POALES

Poaceae
76. *Brachypodium pinnatum*
77. *Elymus caninus*
78. *Festuca gigantea*

GENTIANALES

Rubiaceae
79. *Phuopsis stylosa*

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