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Distribution and status of the Ivy Bee (*Colletes hederæ*) in Counties Wexford and Wicklow, Ireland, Autumn 2022

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The Ivy Bee (Colletes hederæ), a recently-described solitary bee, has been spreading rapidly in Europe. It was first recorded in England in 2001 and in Scotland, 600 km north, in 2021. The first record from Ireland was also in 2021 with the discovery of an aggregation of approximately 1000 ground nests at The Raven Nature Reserve, Co. Wexford. With help from volunteers, we surveyed the distribution and abundance of the Ivy Bee, recording at 91 locations, mainly in counties Wexford and Wicklow, from 28 September to 14 October 2022 when females are in peak numbers. Ivy Bees were seen between The Raven and Brittas Bay Co. Wicklow, 60 km north up the coast, but a maximum of only 3.7 km inland. We found no Ivy Bees south or west of Wexford Harbour. Near The Raven it could be abundant, averaging 26 % (range 1-63 %) of the insects on ivy flowers. We located the original nest aggregation plus 2 more on The Raven and 3 more a few hundred metres north, with a total of c.3,500 nests. An additional aggregation of c.50 nests was found near Courtown beach. The distribution appears disjunct, occurring in four coastal areas in the two counties each separated by areas where Ivy Bees were not seen, suggesting initial establishment from across the Irish Sea at several locations. It is clear that C. hederæ is firmly established in southeast Ireland. Based on what has happened in Britain and elsewhere it will likely spread. Its requirements will be met in many areas: ivy for pollen and nectar and unshaded grassy/bare ground for nesting.

INTRODUCTION

The Ivy Bee (*Colletes hederæ* Schmidt and Westrich, 1993) (Hymenoptera, Colletidae) was described as a distinct species within the *Colletes succinctus* (L.) group in 1993 (Schmidt and Westrich, 1993). It is a solitary ground-nesting bee, each female provisioning her own nest with nectar and pollen, mainly from Ivy (*Hedera helix* L.) flowers (Bischoff *et al.* 2005, Müller and Kuhlmann 2008, Hennessy *et al.* 2021). The adults fly in a single generation in autumn. It is one of five *Colletes* species found in Ireland. Information on identification and biology is contained in Else and Edwards (2018), Falk (2015), and Hennessy *et al.* (2021).

Colletes hederæ has been spreading rapidly into northern, central and southeast Europe (see map in Bogusch *et al.* 2021). It was first recorded in Britain, at Worth Matravers in Dorset, c.2 kilometres from the south coast, in 2001 (Cross 2012, Roberts and Vereecken 2010).

The first record from Scotland, c.600 km north at Thorntonloch on the east coast, was on 17 September 2021 (National Biodiversity Network Atlas 2022), an average annual advance of 30 km. The first record from Ireland was on 12 October 2021 (Beckett and Kenny 2022). An aggregation of approximately 1,000 ground nests in a large clearing in pine woods on coastal sand dunes was discovered at The Raven Nature Reserve (Irish Grid Reference T1134525264; Lat. 52.367948, Long. -6.3658047) by local wildlife photographer Jim Kenny.

From 28 September to 14 October 2022, when females of this autumn-nesting species are on the wing in peak numbers (Hennessy *et al.* 2021, Carreck *et al.* 2023), we carried out a survey of the Ivy Bee, mainly in Co. Wexford but extending north into Co. Wicklow, with some additional surveys in other counties, to determine its distribution and status in Ireland. The survey was based on counting and identifying insects on Ivy flowers (Hennessy *et al.* 2021, Carreck *et al.* 2023), the predominant Ivy Bee food source in Sussex, southeast England comprising 99 % of the

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pollen sampled from females returning to their nests (Hennessy *et al.* 2021). Similarly, Bischoff *et al.* (2005) found that only Ivy pollen was used at a nesting aggregation in Germany. However, analysis of pollen loads from museum specimens from Europe showed polylecty but with a strong preference for Ivy (Müller and Kuhlmann 2008). Pollen samples collected from females returning to their nests at The Raven during the current study indicate that in this location Ivy is by far the main pollen source (99.95 %, see Results).

BACKGROUND

The Raven Nature Reserve is 589 ha, state-owned, mainly sand dunes covered in planted pine trees (National Parks & Wildlife Service 2022). To the east is the Irish Sea, to the west is former slob land drained for agriculture, and to the north and northwest are dunes not covered in pines, farms and agricultural land, woods, housing, caravan parks, and villages. The southern tip projects into Wexford harbour and reaches to within 4 km of Rosslare Beach, a sand spit projecting north from the southern side. The coast north from The Raven to Brittas Bay is mostly low lying and sandy, often with dunes, but with some soft cliff.

The minimum distance between County Wexford and Great Britain, Pembrokeshire, is approximately 78 km making this the most southerly close crossing between Britain and Ireland. The distance from the Raven to Pembrokeshire is approximately 89 km, slightly less than the 95 km from the Dorset coast at Worth Matravers to the closest part of France, the Cotentin Peninsula in Normandy.

Approximately 7,000 records of Ivy Bee sightings in Britain have been submitted to the National Biodiversity Network Atlas (2022), which we viewed online. These show that the Ivy Bee was first recorded in western Pembrokeshire in 2014, versus 2017 for the Lleyn Peninsula and 2021 for Anglesey, which project west from Wales towards Irish counties Wexford, Wicklow and Dublin, respectively.

This seems to indicate a 7-year delay in crossing to Wexford. However, unless colonization had involved more than 100 females in 2020 or 1,000 in 2021, all arriving at the same place, the Ivy Bee has likely been present at The Raven for a number of years, probably since 2019 and possibly since 2016–2018, to have built up to the approximately 1,000 nests seen in 2020. Bischoff *et al.* (2005) note that a female Ivy Bee can build up to 18 cells under good conditions. If half produce a female bee then the maximum population growth rate would be 9-fold per year. A single colonizing bee could, under optimal conditions, give rise to 1,000 females in 4–5 years, or 3–4 years for

10 colonizing females. Of course, additional bees might also have crossed the Irish Sea to The Raven in later years to boost population growth. Although the actual colonization delay from Pembrokeshire to Wexford cannot be determined precisely, it was probably only 2–4 years with colonization likely occurring sometime between 2016 and 2018. This estimate is supported by records from southwest Britain. The Ivy Bee was first recorded at Land's End, the western tip of Cornwall, in 2015 and in the Scilly Isles, some 44 km west across the sea, in 2019, a delay of 4 years. The Scillies are closer to Britain than is Wexford or Ireland but are a smaller target.

The habitat at The Raven is ideal for Ivy Bees. Much mature ivy grows up tree trunks with copious flowers in autumn (FR, personal observations) with suitable nesting areas in the sandy dune soil. A colonising female would be able to nest and forage with minimal delay. However, many other coastal locations in eastern Ireland would likely also be suitable as Ivy is extremely common and widespread (Metcalf 2005) and the nesting requirements of the Ivy Bee, which are basically for unshaded grassy areas with bare patches (Maher *et al.* 2019, Hennessy *et al.* 2020, FR pers. obs), are widely met.

METHODS

Our main Ivy Bee survey method was to observe Ivy in bloom and identify insects on the flowers, including any Ivy Bees (Garbuzov and Ratnieks 2014, Hennessy *et al.* 2021, Carreck *et al.* 2023). Surveying Ivy flowers is a suitable method because Ivy Bees forage exclusively (Bischoff *et al.* 2005), almost exclusively (Hennessy *et al.* 2021), or mainly (Müller and Kuhlmann 2008) on Ivy.

Two types of survey were carried out. In Presence-Absence surveys (Carreck *et al.* 2023), up to 100 insects on Ivy flowers were identified. The survey was terminated when the first Ivy Bee was seen and the Ivy Bee was considered to be present. If zero Ivy Bees were seen when 100 insects had been observed the Ivy Bee was considered absent. Presence-Absence surveys were useful to quickly determine the general range of the Ivy Bee at the start of the project in the area adjacent to The Raven, especially in and around Curraclloe village. It was also suitable for volunteers who may not have the ability to identify insects more finely.

In 100-Insect surveys (Hennessy *et al.* 2021, Carreck *et al.* 2023), 100 (in a few cases in areas with Ivy Bee present, in was only possible to survey 50–80) insects foraging on Ivy flowers were identified in the following categories: Ivy Bee males, Ivy Bee females, honey bees, bumble bees, other bees (none were seen), social wasps, solitary



Figure 1. All Ivy Bee (*Colletes hederæ*) survey records (Autumn 2022) and closest crossing distances to Ireland from Britain and the Isle of Man, and year of first record of Ivy Bee, if present (National Biodiversity Network, accessed 6 December 2022).

wasps, hover flies, other flies, butterflies, moths (none were seen), other insects (none were seen). Both survey methods give the same confidence in the absence of Ivy Bees as both identify 100 insects in locations with zero Ivy Bees observed.

Surveys were carried out during good weather when honey bees were actively foraging on Ivy flowers. Conditions were generally >13 °C, wind ≤4 on Beaufort Scale, >30 % blue sky, and not raining. Experience has shown that when honey bees are actively foraging, Ivy Bees are also. Ivy was located by driving or walking around to find mature accessible Ivy in bloom, generally in hedges but sometimes on walls or tree trunks. Although Ivy on tree trunks is common most is too high to survey. Ivy for surveying was of differing extents, from as little as c.10 m along a wall to scattered patches in c.500 m of hedges or village. Survey locations were usually linear. If 100 insects could not be identified in one visit, additional visits were made at least one hour later on the same or subsequent days, with up to 4 visits.

Volunteers were suitably trained (Ratnieks *et*

al. 2016) to identify Ivy Bee by taking them to a location in Curracloe village where male and female Ivy Bees, honey bees, hover flies, wasps, and other insects were foraging in numbers on Ivy and for one or more of the authors to point out their distinctive characteristics. In addition, volunteers were shown photographs and had a photo chart. Male and female Ivy Bees are distinct in appearance from each other and other insects so that volunteers had no difficulty in identification. Volunteers were usually accompanied, at least initially, by a person with experience.

Ivy Bee aggregations were surveyed in the dunes at The Raven Nature Reserve and north as far as Ballinesker Beach, 2.3 km. We did not survey other areas where Ivy Bees may have been nesting in grassy locations including road verges, field edges and domestic lawns, as this was impractically large and would have included many private areas. Pollen samples were taken from the scopas of females returning to their nests at The Raven on 29 September (north nest aggregation; n = 14 females) and 1 October (original aggregation; n = 9 females). One

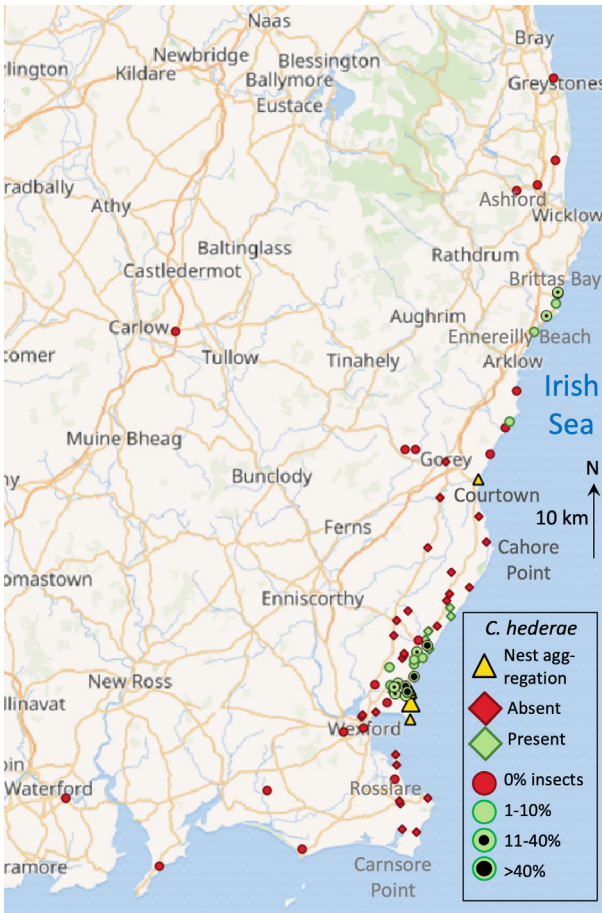


Figure 2. All Ivy Bee (*Colletes hederae*) survey records (Autumn 2022) in SE Ireland, in mainly Cos Wexford and Wicklow.

hundred grains per female were identified using a compound microscope following methods in Hennessy *et al.* (2021).

RESULTS AND DISCUSSION

Nest aggregations

We cannot be certain that we discovered all aggregations in the dunes at The Raven and north to Ballinesker Beach. However, it is likely that our survey discovered all sizeable aggregations, because in the dunes it appears that Ivy Bees only nest in a particular and somewhat restricted dune sub-habitat that is easily identified. Dune areas shaded by trees, or open with dense vegetation such as Marram Grass (*Ammophila arenaria* (L.) Link), or pure sand, appear not to be used, and these constitute most of the land. In addition, we were assisted by Mr Dominic Berridge, who is the Ranger at The Raven and knows the land well. Nests were on flat and sloping land, unshaded, with short often sparse vegetation and some bare ground, with some on the vertical sides of mini sand cliffs of various heights, typically 10-30

cm. Nests in the dunes are conspicuous due to the circles of pale sand excavated and are easily verified by the presence of Ivy Bees, including returning females and males seeking mates.

The original aggregation was relocated and had c.2,100 nests when surveyed on 28 September 2022. Searching at The Raven over the following week yielded one additional aggregation at the north end with c.350 nests and one at the south end with just 4 nests. We located 3 additional aggregations in the dunes 150, 160, and 500 m north of the northern boundary of The Raven with c.600, 250, and 250 nests, respectively. Volunteer Graeme Blyth found an aggregation near Courtown Beach, also in dunes, with c.50 nests.

All but one of the 2,227 pollen grains, 100 from each of 22 females and 27 from one female at the original aggregation, were Ivy (99.96 %) with one *Taraxacum* sp. (0.04 %) from a north aggregation female.

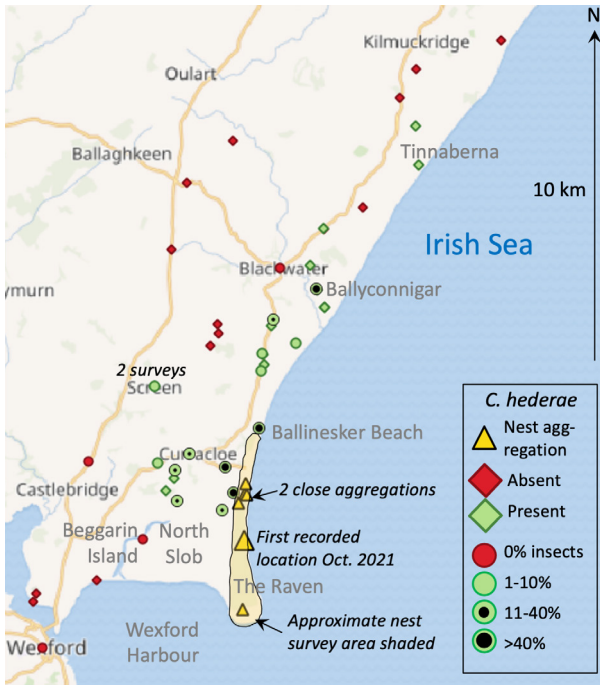


Figure 3. All Ivy Bee (*Colletes hederæ*) survey records (Autumn 2022) in the main survey area in Co. Wexford. Data points show results of 3 survey types: 1) Nest aggregation surveys in the marked area at the Raven and north in the dunes to Ballinesker Beach (n = 6 aggregations; the first discovered nest aggregation, October 2021, at The Raven has a larger triangle). (Fig. 2 shows an additional aggregation fortuitously found at Courtown Beach); 2) Presence-Absence surveys of insects foraging on Ivy flowers; 3) 100-Insect surveys of insects on Ivy flowers, with proportions of Ivy Bees.

Insects on Ivy flowers

In the 100-insect surveys in the area adjacent to The Raven, using data only from survey locations where Ivy Bees were present, the proportions of the various insects were: Ivy Bees 26.0 % (range 1-63 %) (males 2.6 %); honey bees 37.5 %; bumble bees 3.5 %; social wasps 9.4 %; other wasps 0.1 %; hover flies 15.6 %; other flies 5.7 %; butterflies 2.3 % (n = 1 Small Tortoiseshell (*Aglais urticae* (Linnaeus, 1758)), 1 Painted Lady (*Vanessa cardui* (Linnaeus, 1758)), 1 Speckled Wood (*Pararge aegeria* (Linnaeus, 1758)), 11 Comma (*Polygonia c-album* (Linnaeus, 1758)), 41 Red Admiral (*Vanessa atalanta* (Linnaeus, 1758))). These proportions are similar to those found in Sussex, England, on Ivy flowers (Garbuzov and Ratnieks 2014; Hennessy *et al.* 2021; Carreck *et al.* 2023). They show that in Ireland, as in Britain, Ivy helps support a wide range of flower-visiting insects in autumn and is probably somewhat underappreciated for its insect conservation value (Garbuzov and Ratnieks 2014). One species seen frequently on Ivy, the Comma butterfly is another recent colonist and has been established in southeast Ireland since about 2000 (O'Donnell and Wilson 2009; Harding and Power 2016).

Where is the Ivy Bee found or not found?

The maps show that in autumn 2022 the Ivy Bee was well established in southeast Ireland, being found in some coastal areas of Cos Wexford and Wicklow. The distribution appears to be disjunct with 4 areas where the Ivy Bee was detected with

intervening non-detection areas.

In the Co. Wexford study area adjacent to and extending from the initial discovery of the large nest aggregation on The Raven in 2021, the Ivy Bee was present almost continuously in an area extending approximately 14 km north along the coast from the initial discovery site to Tinnaberna Beach and also 2.3 km south within The Raven. However, there is one negative intervening Presence-Absence survey point 0.9 km from the coast and 2-3 km south of the two Tinnaberna sites. The furthest from the coast was 3.7 km at Screen village, where the Ivy Bee was only 1 % of insects, with one Ivy Bee, one male and one female, recorded in each of two 100-Insect surveys. This site is only 5.7 km from the first-discovered aggregation site at The Raven and shows the relative slowness of spread inland. Similarly, it has only part crossed the North Slob to the immediate west of the Raven, and was not seen at Beggan Island, only 3.3 km west. It was not found in locations in south and southeast Wexford, including Wexford town, the south coast, and the south east coast in the Rosslare area, and inland. It was not found in a western arc of survey locations from Wexford town, the north side of Wexford Harbour, to 1 km northeast of Castlebridge town, and further north.

Further to the north in Co. Wexford the Ivy Bee, including a nest aggregation, was found near Courtown Beach, some 18 km north of the two most northern Ivy Bee present sites at Tinnaberna, with three intervening coastal

surveys and five surveys a few kilometres inland all negative. A further 9 km north near Kilpatrick Beach the Ivy Bee was again detected, north of two intervening non-detection coastal sites. In Co. Wicklow, 13 km further north, the Ivy Bee was detected at Ennereilly beach, with one intervening non-detection location, with a total of 4 detections in 6 km of coast from Ennereilly to Brittas Bay. Surveys near the coast a further 18 km and 30 km further north in County Wicklow near Newcastle and in Greystones did not detect the Ivy Bee, which was also absent 4 and 6 km inland at or near Ashford.

Opportunistic 100-Insect surveys in other parts of Ireland, two relatively close to (Waterford City; Co. Carlow) and three far from (Armagh City; Derrymore, Gawley's Gate, Co. Antrim; Ardglass, Co. Down) the initial discovery site, did not detect the Ivy Bee.

Multiple colonization of Ireland from Britain?

The map data alone do not allow a clear conclusion to be made as to how Ireland was colonized, in particular the number of locations. However, the disjunct distribution of the Ivy Bee on the Wexford and Wicklow coasts suggests that bees could have initially arrived from Britain and bred in Ireland at several locations. Alternatively, it is possible that the Ivy Bee spread north along the coast from a single colonization, presumably in The Raven area. We make the following points concerning these alternative scenarios.

In support of multiple locations, the Wicklow and north Wexford coast is directly across the Irish Sea from the Lley Peninsula in Wales, where Ivy Bees were first detected in 2017, some 3 years after Pembrokeshire, and which is an additional close Irish Sea crossing. Genetic data indicate that Britain was colonized multiple times from continental Europe (Dellicour *et al.* 2013). In Slovakia and Czechia, Bogusch *et al.* (2021) report a possibly analogous situation in which Ivy Bees were initially found in some areas but not others nearby, indicating patchy initial colonization across a wide front. In this case, however, colonization was over land from the south and west, from Austria, not across the sea.

In support of spread within Ireland from a single colonization location the distance from the initial discovery site at The Raven is only 60 km to the most northern site at Brittas Bay. Given that the Ivy Bee colonized Britain at the remarkable rate of 30 km per year, 60 km is not far, especially given that the Ivy Bee has probably been present at The Raven for approximately 5 years. However, if spread had been from a single site why are there gaps in the distribution of the Ivy Bee along the coast? This could be the result if the females dispersing long distances along

the coast were few in number. It may also be due to inadequate surveying. However, as noted above there were 8 negative survey locations in northern Wexford between areas with the Ivy Bee present. The low rate of spread west is also hard to explain as Ivy is almost ubiquitous, and perhaps suggests that spread within Ireland has initially been quite slow, or that dispersing bees follow the coast. The coastline may be an attractive habitat for dispersing females to follow and use, with abundant dunes and sandy areas suitable for nesting. In Britain, the records indicate that in some areas the Ivy Bee initially spread along the coasts, and later inland. The Ivy Bee does not need dunes to nest. In Britain it uses road verges, lawns and short grass (Maher *et al.* 2019, FR personal observations) and is also abundant inland (Carreck *et al.* 2023, National Biodiversity Network Atlas 2022).

The two scenarios outlined above are not mutually exclusive. Studies involving samples collected in different parts of Wicklow, Wexford, and Wales, for testing using DNA markers (Dellicour *et al.* 2013) could potentially be used to determine how many bees initially colonized Ireland, where they landed and where they set out from. It is also possible that further colonization from Britain will take place, including south of Wexford Harbour and north of Co. Wicklow. The Ivy Bee was recorded in Anglesey in 2021 and the Isle of Man in 2022 (NBN Atlas), which are additional close crossings to Ireland. However, it has not yet been recorded in southwest Scotland.

Recent bee colonists to Ireland

The Ivy Bee is one of 3 bee species that have colonized Ireland within the past decade, almost certainly from Britain, and for which authoritative records are available. The others are the Tree Bumble Bee (*Bombus hypnorum* Linnaeus, 1758) (O'Donnell 2018, National Biodiversity Data Centre 2017) and the Wool Carder Bee (*Anthidium manicatum* (Linnaeus, 1758)) which was first recorded in Ireland, in Co. Wexford, in 2015 (National Biodiversity Data Centre 2022b).

For *B. hypnorum*, O'Donnell (2018) records the capture of a specimen at St. Stephens Green, Dublin city, in September 2017. This was identified by an expert (UF) and placed in the National Museum of Ireland, Natural History (NMINH:2017.36.1). There is an earlier record from 2014 on the National Biodiversity Network Atlas website for Bangor, Co. Down, and two more for 2017, one for the same location and one from Coleraine, Co. Derry. On the same website there are also 16 subsequent records for Northern Ireland and one more for Dublin. These are generally field identifications, not necessarily

by experts. It seems that *B. hypnorum* has been resident in Ireland for 5 years or more. This species is widely distributed in Britain including southwest Scotland so that colonization anywhere on the east and northeast coasts of Ireland would seem to have been possible.

One thing these three bees have in common is that they are all large, which would facilitate flying across the Irish Sea. The Ivy Bee, whose females are the size of a honey bee worker, is the smallest. All are widespread in Britain including west Wales, but only *B. hypnorum* occurs in far southwest Scotland. Both *B. hypnorum* and the Ivy Bee are recent colonists to Britain, both first recorded in 2001 near the south coast (Goulson and Williams 2001), and both spread widely and rapidly in Britain. Their spread to Ireland is probably aided by their colonization background which likely will have caused natural selection for increased colonizing ability (Ratnieks 1990, Shine *et al.* 2011). *A. manicatum* is native to Britain and Europe. Interestingly, it has colonized North and South America, New Zealand, and the Canary Islands. Jaycox (1967) notes that it will occupy ready-made nesting sites in movable objects, facilitating spread by man to new locations.

Several other bee species have been recently recorded in Ireland. The Hairy-footed Flower Bee (*Anthophora plumipes* (Pallas, 1772)) was seen in a domestic garden in Harold's Cross, Dublin city on 27 March 2022 (NBDC 2022a). As both a male and a female were seen, and photographed, this suggests successful nesting the previous year. However, it is too early to know if it is established in Ireland. In addition, the Blue Mason Bee (*Osmia caerulea* (Linnaeus, 1758)) and Lathbury's Nomad Bee (*Nomada lathburiana* (Kirby, 1802)) have also been recorded (OB pers. obs.). It will be interesting to see if these also become established. All three are widespread in Britain. *N. lathburiana* is a cuckoo and its host, the Ashy Mining Bee (*Andrena cineraria* (Linnaeus, 1758)), is widely distributed in Ireland.

CONCLUDING REMARKS

For several years before its arrival there were articles in the Irish newspapers, media and web sites concerning the Ivy Bee's expected imminent arrival. Their tone was informative, even welcoming. Now that it is firmly established in southeast Ireland what should we expect? Based on what happened in Britain, the Ivy Bee is likely to colonize much of Ireland within one or two decades given that its main food supply, pollen and nectar from Ivy flowers (Hennessy *et al.* 2021), and general nesting requirements, unshaded grassy-bare areas (Carreck *et al.* 2023,

Hennessy *et al.* 2021, Maher *et al.* 2019), are abundant. It remains to be seen whether the Irish climate and environment restrict the Ivy Bee from significant areas. It is often remarked that Ireland has a less favourable climate for many insects than Britain. However, in Britain the Ivy Bee occurs in northern inland areas not known for good weather, such as the Pennines (National Biodiversity Network Atlas 2022).

The Ivy Bee has little significance to human safety or economically. Even when active in the midst of an aggregation of thousands of nests with bees swirling around, a person is rarely stung and the sting is mild, similar to a nettle (Hennessy *et al.* 2020). It almost exclusively gathers pollen from Ivy and so will have no role in crop pollination.

In Sussex, UK, the Ivy Bee is now very abundant, equalling or even exceeding the honey bee in numbers on Ivy flowers (Hennessy *et al.* 2021, Carreck *et al.* 2023). The Ivy Bee is abundant on Ivy flowers in the area around The Raven, and is already almost as numerous on Ivy flowers as the honey bee (26 % vs 38 %).

Is it possible that the Ivy Bee will increase to such numbers as to diminish the food supply for honey bees, which in Britain and presumably Ireland forage mainly on Ivy in the autumn (Hennessy *et al.* 2021) and are the only other abundant bee on Ivy, and for other flower visiting insects? Given that nest sites will probably not be in short supply, what could limit Ivy Bee populations? In Europe the Ivy Bee is subject to nest cleptoparasitism by the meloid beetle *Stenoria analis* (Müller and Weibel 2020). As a female beetle can produce hundreds or thousands of eggs, and each larva consumes the food provision in one Ivy Bee cell, it has the potential to build up rapidly in numbers in nest aggregations and greatly reduce the number of Ivy Bee offspring. The beetle is not yet found in Britain and so is unlikely to be present in Ireland. However, it may eventually colonize both Britain and Ireland. Another *C. hederae* parasite is the cuckoo bee *Epeolus fallax*, which is found in the western Mediterranean and into central France and has recently been recorded in southwest Germany probably due to the spread of the Ivy Bee (Westrich and Büllés 2016).

Ivy is a key and underappreciated resource for autumn-flying flower-visiting insects of all types (Garbuzov and Ratnieks 2014). At its current level of abundance in Britain, the Ivy Bee is unlikely to be competing in a harmful way with other flower-visiting insects as Ivy pollen and nectar are produced in such large amounts by this abundant plant (Garbuzov and Ratnieks 2014) that much is wasted. For example, crystallized nectar can often be seen as a greyish residue on

Ivy flowers showing that it has not been collected (Harris *et al.* unpublished data). Similar nectar wastage residues were seen in Ireland in our study (FR pers. obs). In addition, many anthers fall off Ivy flowers with much uncollected pollen remaining (Harris *et al.* unpublished data).

The Ivy Bee has a distinct appearance, phenology and foraging pattern, and can easily be recognized and observed as it forages on Ivy flowers in the autumn. Its arrival in new areas is something that any interested person can easily see for themselves and is an opportunity to take an interest in what is almost certainly a benign colonizing species that seems to have caught the imagination of people in Ireland. Ireland can surely welcome another bee to add to its relatively meagre bee fauna of approximately 100 species (FitzPatrick *et al.* 2006).

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