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Xenosacalles gen.n. *irlandikos* sp.n. (Coleoptera: Curculionidae: Cryptorhynchinae) – Cuias es?

by

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with 1 3D-scan, 14 figures and 1 table

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Abstract. A new genus and species, *Xenosacalles* gen.n. *irlandikos* sp.n., are described from Northern Ireland and are distinguished morphologically and molecularly from other taxa of Cryptorhynchinae. The first description is accompanied by observations on the biology of the introduced species, which does not belong to any of the genera known to us from the Western Palaearctic. In addition to the mtCO1 barcode of the new species and numerous 2D focus stacking images, a printable 3D scan of a paratype completes the description. Finally, the collected observations on the bionomics of *Xenosacalles irlandikos* are presented.

Keywords. New species, morphology, molecular analysis, bionomics, integrative taxonomy, barcoding, 3D scan, 3D print, Northern Ireland.

Nomenclatural acts
Xenosacalles Stüben gen.n.: urn:lsid:zoobank.org:act:6214A305-1B58-40A0-A7FF-D2E048F8F728.
Xenosacalles irlandikos Stüben, Clarke, Anderson sp.n.: urn:lsid:zoobank.org:act:8F761124-C841-4DD6-8387-435BC7AFD977

Electronic Supplement
URL: https://www.curci.de/?wnsupplement=113
ZIP file includes:
1) Fig 1. as single page PDF file;
2) 3D image file from Fig. 1 in *.u3d format
3) 3D printer file in *.obj format to use with 3D printer
4) All images at maximum magnification and resolution

To see the 3D scan, the article must be downloaded!

Fig. 1 (Internet version). 3D scan of the new species *Xenosacalles irlandikos* from Northern Ireland, near Belfast (paratype, female). Note: **The 3D PDF graphic can only be activated in the (automatically) downloaded article.** Then, please click into the picture and allow 3D content if your PDF reader is asking you for permission (see info bar under the menu). For information on the technical specifications of the scanner, see Stüben 2024.

Introduction

Cuias es? We have asked ourselves this question many times and are still unable to provide an answer. Some Aliens among the Cryptorhynchinae, as the unwanted guests are often called, who are immediately assumed to pose a threat to the native fauna and flora, have been present on some European islands in recent decades: *Achopera alternata* Lea, 1910 (England), *Onyxacalles gibraltarensis* Stüben, 2002 (England), *Poggionymus crassus* Colonnelli, 1983 (Sardinia), *Echinoacalles franzi* Stüben, 2008 (El Hierro) or *Campylonotum cypricum* Stüben, 2021 (Cyprus). The list goes on and, as in the last three cases, we don't even know where the species originated.

Cryptorhynchinae weevils, which develop in seedlings and woody plant remains such as twigs and roots, are known (like many Cossoninae, for example) to enjoy travelling. In colonial times, Britons and other seafaring nations from all over the world also liked to keep plant souvenirs in their own front gardens or display them in lovingly tended parks - in the open air or under glass domes. An enrichment for those interested in botanical rarities, or a horror for conservationists who fear for the preservation of native fauna and flora. For the translocated species themselves, it can be a blessing, whose survival in tropical regions is made almost impossible between charred tree skeletons and oil palm plantations. So welcome to times of climate change? Perhaps these are not scientific or ecological questions in the strictest sense, but simply - depending on your point of view - ethical issues in the broadest sense: How do we deal with climate refugees or introduced species in a cultural landscape that has been completely remodelled for at least 2000 years and in which there are no more primeval forests?

For taxonomists, however, such 'displaced species', as they should be correctly called, are the ultimate challenge! Between E.C. Zimmerman's ‚Australian Weevils' (1992) and C.S. Papp's ‚Cryptorhynchinae of the New World' (1979), between C.H.C. Lyal's ‚Cryptorhynchinae of New Zealand' (1993) and the 1000-fold offers of the Internet, one's head is buzzing with images after days and weeks of wandering around (Lyal, 1993; Papp, 1979; Zimmerman, 1992). In such situations, the first harbingers of image recognition algorithms and artificial intelligence are still of no help. What cannot obviously be found among around 6000 Cryptorhynchinae species described to date worldwide, in around 550 genera, does not exist for science - except on the island of Ireland. That's for sure!

So we decided not to wait any longer and to describe this invader - despite all the scientific reservations and the fact that we don't even know the origin and relationship of this alien. Because we can only protect (or not, to avoid misunderstandings) what we know, what we have at least 'named', as conservationists like to say. If this is correct, and the protection of species is no longer possible in the tropics and subtropics because they no longer exist, then it might be possible here (in a figurative sense ‚in vito', at least until there are intact ecosystems on the other side of the world again ("Citizen Conservation" 2024).Taxonomy, properly understood, is therefore anything but an ivory-tower science, but a highly committed matter and indirectly also an answer to the ethical questions posed above.

Fig. 2. Holotype (male) of *Xenosacalles irlandikos* (Photos; Stüben).

Description of *Xenosacalles* Stüben gen.n. *irlandikos* Stüben, Clarke & Anderson sp.n. (Fig. 1-6)

Family: Curculionidae
Subfamily: Cryptorhynchinae
New genus: *Xenosacalles* Stüben

The new genus *Xenosacalles* Stüben - description and differential diagnosis

Type species of the new genus: *Xenosacalles irlandikos* Stüben, Clarke & Anderson

The new monotypic genus *Xenosacalles* is described on the basis of the following introduced species *X. irlandikos* from the east of Northern Ireland (near Belfast). It differs from all western Palaearctic genera of the subfamily Cryptorhynchinae (Coleoptera: Curculionidae) by 1. the circular, strongly pointed, reddish-brown scutellum, 2. the short, obovate elytra, 3. the protruding (strongly convex) eyes, and 4. the missing inner sac structure of the aedeagus (the so-called endophallus), a characteristic that the new genus only shares with the species of the genus *Echinodera* Wollaston, primarily native to the Mediterranean region, and the three *Acalles* species of the subgenus *Origoacalles* Stüben & Astrin, 2010 mainly from Portugal, Madeira and the Canary Islands. However, their median lobe of the aedeagus is pointed when viewed ventrally, whereas the median lobe of the species of the new genus is broadly rounded towards the tip.

In a first molecular assignment with p-distances in the mtCO1 gene of well over 14%, the species moves into the (distant) proximity of the two western Palaearctic, but not closely related northwestern African and southwestern European *Coloracalles* species, *C. edoughensis* (Desbrochers des Loges, 1892) and *C. humerosus* Fairmaire, 1862. But both have a large, complex endophallus and do not have such towering tufts consisting of many erect long bristles on the elytral descent, as it is characteristic of most tree-dwelling species of the Cryptorhynchinae on the Atlantic Macaronesian islands. The latter, such as the *Silvacalles* or *Dendroacalles* species, have very elongate elytra and always a genus-specific inner sac structure of the aedeagus.

Derivatio nominis. The name of the new genus is composed of *Xénos* (Greek: Ξένος, Engl.: foreign) and ‚*Acalles*' (Engl.: not nice or beautiful), of which we do not know where it originated, how it could have reached the island of Ireland, but which in any case does not belong to the western Palaearctic species of the genus *Acalles* C.J. Schoenherr, 1825.

Fig. 3. Allotype (female) of *Xenosacalles irlandikos* (Photos: Stüben).

Description of the new species *Xenosacalles irlandikos* Stüben, Clarke & Anderson

Type material

Holotype: 1♂, "Northern Ireland, Crawfordsburn Country Park in Co. Down, 30 m, 54°39'48.74"N 5°43'56.12"W, 15.11.2023, Hand caught on fence, leg. Clarke & Stewart, coll. Senckenberg, Deutsches Entomologisches Institut, Müncheberg (SDEI) / **Paratypes: 5**♂♂ **/ 33** ♀♀, same location as holotype, date range 14.1.23 to 2.2.24, coll. Stüben, Clarke & Rosell., 1 to 7 females in each: National Museums of Northern Ireland (NMNI), National Museums Scotland (NMS), National Museums of Ireland (NMI), Agri-food and Biosciences Institute (AFBI), Natural History Museum, London (NHM), Zoologisches Forschungsmuseum Alexander König (ZFMK), SDEI, 1 to 3 males in each: NMI, NMNI, and AFBI, **1** ♀**,** "Northern Ireland, Belvoir Park Forest, 13.6m, 54.557319, -5.9345806, 5.8.23, hand caught on wooden hiking trail marker, leg. Clarke, coll. NMNI, **1** ♀**,** "Northern Ireland, Glenlyon Park, 53.4m, 54.638417, -5.8231831, 1.1.24, hand caught on wooden fence, leg. Clarke & Rosell, coll, AFBI / **DNA-types** (= paratypes): **1**♂**,** Northern Ireland, Crawfordsburn Country Park, near river, 54, 571418, -5,7324714, 33 m, on fence, with Laurel nearby in woodland, 28.10.2023, hand collected by Clarke & Rosell, collector's number: **4044-PST**, CO1 sequence: see Appendix 1; **1**♀**,** Northern Ireland, Colin Glen Forest, near river, 54,571418, -6,0220649, 92 m, 5.11.2023, hand collected by Rosell, collector's number: **4045-PST**, CO1 sequence: see Appendix 1; both DNA-samples deposited in coll. Senckenberg Deutsches Entomologisches Institut, Germany: Müncheberg (SDEI), tissue samples in coll. Curculio Institute.

Length: 2.2 – 3.5 mm (without rostrum)

Head: Seen from above, the strongly protruding, almost circular eyes are clearly visible; the rostrum of the males is short and robust, at least 3.1x longer than wide between the antennal insertions, clearly widened from there towards the apex and covered with slightly protruding, light-coloured scales towards the base; the rostrum of the females is clearly narrower and longer, but at least 4.1x longer than wide, much shinier and largely without scales; the antennae start in the last third of the rostrum in males, immediately behind the middle in females; the first two antennomeres are elongated (especially in females!), the 5 following antennomeres are short and spherical, but become increasingly larger towards the club; the club is again conspicuously long oval, almost as long as the last 5 antennomeres together.

Pronotum: 1.1x - 1.2x wider than long; widest point approximately at the end of the basal third, from there to the base strongly, bulbously rounded, towards the anterior margin with a distinct depression; pronotum covered with circular, close-fitting, brown to dark brown and a few white scales; in front of the anterior margin, the sides and the middle of the disc covered with a few vertically erect, narrow long bristles, which can form small tufts or clusters; the base of the pronotum almost twice as long as the anterior margin.

Elytra: Conspicuously short, nearly as broad as long, obovate; broadest part approximately at the end of the first basal fifth, from there to the corners of the base laterally strongly rounded, towards the apex of the elytra distinctly more elongated oval; with a strong, towering, round, light-brown tuft of bristles on the 1st interval of the elytral declivity, with an elongated tuft on the second interval in front of the middle and further elongated tufts of bristles on the 3rd and 4th interval, which together with the strongly punctured striae give the elytra a rough, rugged surface; the colourfully mixed ground vestiture consists of tiny brown, beige and a few white scales arranged like roof tiles; they are at most one third the size of the ground scales of the pronotum; the base of the elytra is straight, with probably the most striking feature of the species: the reddish-brown, round, towering scutellum, which also protrudes in a conical shape when viewed laterally.

Legs: Short; the front femora covered with narrow, light-coloured, long, clearly protruding bristles just reach the anterior margin of the eye, the hind femora end before the tip of the elytra.

Underside: With a deep and wide rostrum channel whose mesosternal receptaculum is semicircular and ends between the mid-coxae; the underside predominantly with long, beige, isolated and slightly raised bristles; the latter are very fine on the last abdominal segment; the two abdominal segments in front are very narrow and together no longer than the 4th segment.

Aedeagus: When viewed ventrally, the tip of the median lobus of the aedeagus is rounded (laid flat, the tip is at a right angle) - without an internal sac structure! (Fig. 4)

Female genitalia: See: Fig. 5.

Differential diagnosis

Since no comparable species outside the Palaearctic have been available to us to date, even after an initial molecular assessment (see Appendix 1 and GenBank), the only remaining option is to compare them with the two *Coloracalles* species, *C. edoughensis* and *C. humerosus,* from northwestern African and southwestern European.

In fact, the new species shares with *C. edoughensis* (described from Mt. Edough in Algeria) the short, round elytra and with *C. humerosus* (described from the French Pyrenees) partly the - albeit here much smaller - bristle tufts on the elytral declivity and elongated bristle ag-

gregations in front of the elytral base on the first three intervals. However, from a morphological point of view, the presence of a complex inner sac structure of the aedeagus, the strongly developed elytral bristle tufts and the eyes that protrude strongly from the head shape tend to speak against a close relationship between the species mentioned (Fig. 6).

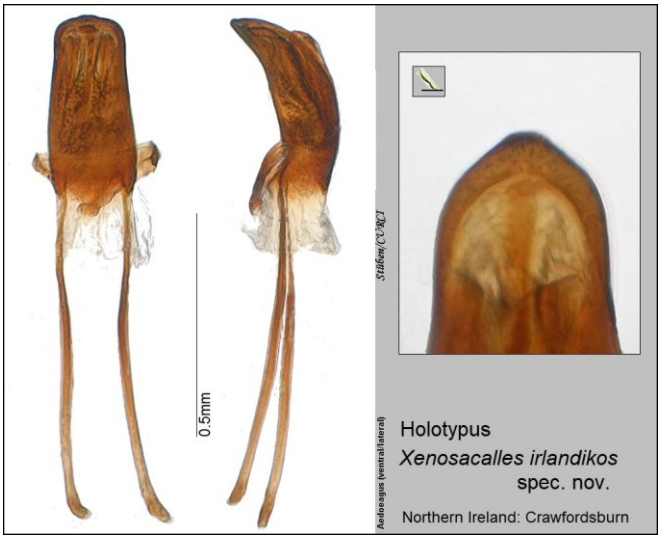

Fig. 4. Aedeagus of *Xenosacalles irlandikos* (Holotype)

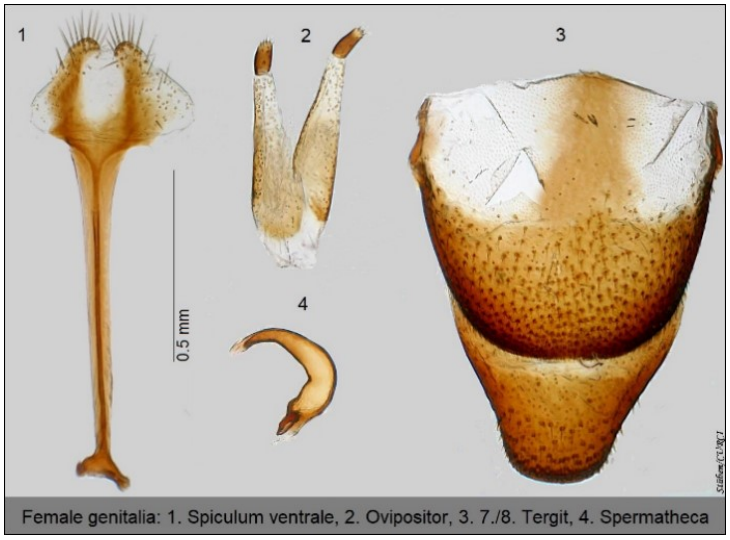

Fig. 5. Female genitalia of *Xenosacalles irlandikos* (Allotype) (Photos: Stüben).

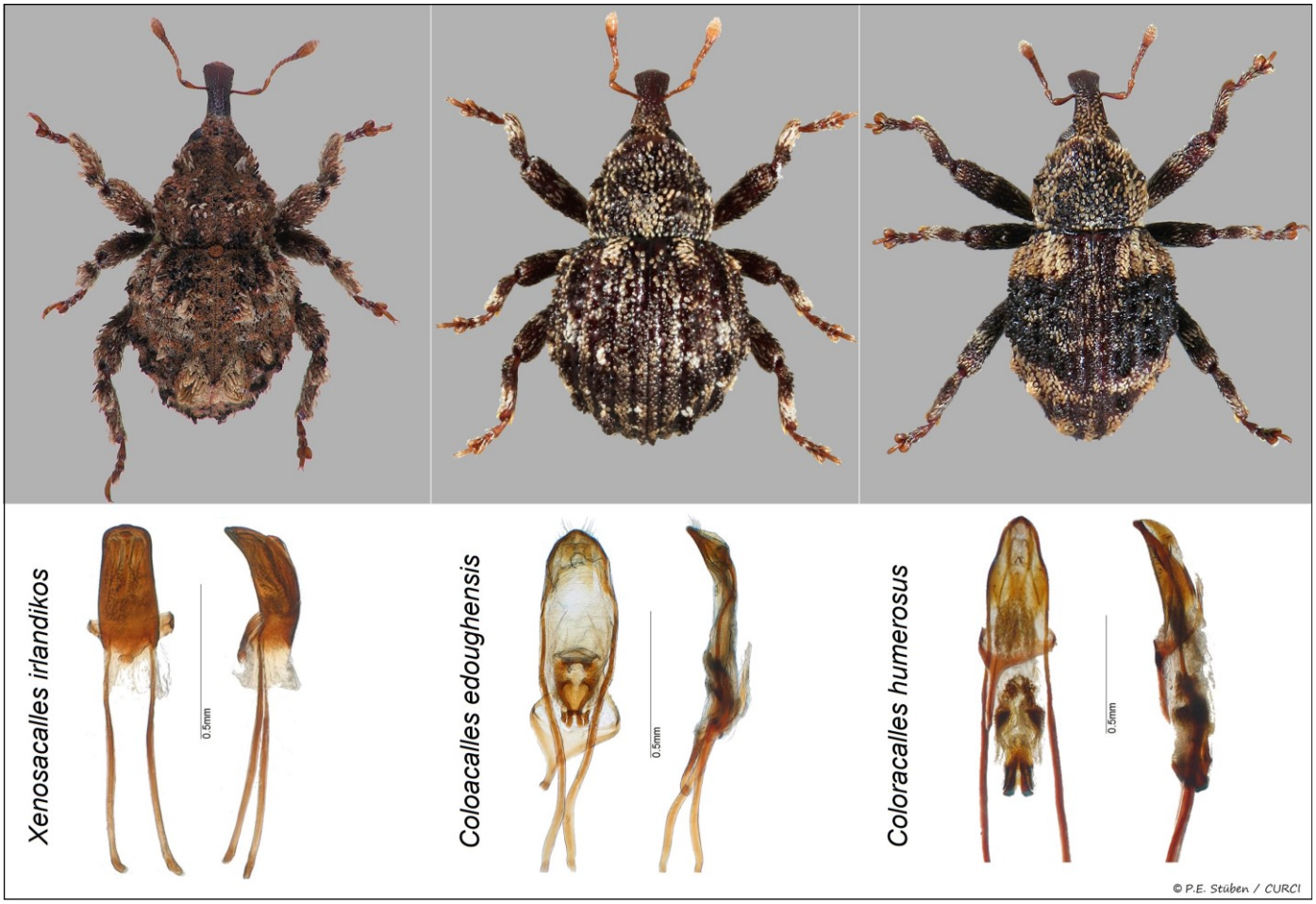

Fig. 6. *Xenosacalles irlandikos* in comparison with two *Coloracalles* species from the Western Palaearctic.

According to knowledge of all 422 Western Palearctic species of Cryptorhynchinae and their almost complete molecular recording (Stüben 2018), the certain realization remains that there is nothing comparable from the islands of the Azores in the west to the Urals in the east. This allows the conclusion that it could be a representative of a genus known to us in this large area - neither morphologically nor molecularly!

Distribution. This species is confirmed from five parks and woodlands in the Greater Belfast Area. Further recorded from Donard Park, Co. Down (Fig. 7).

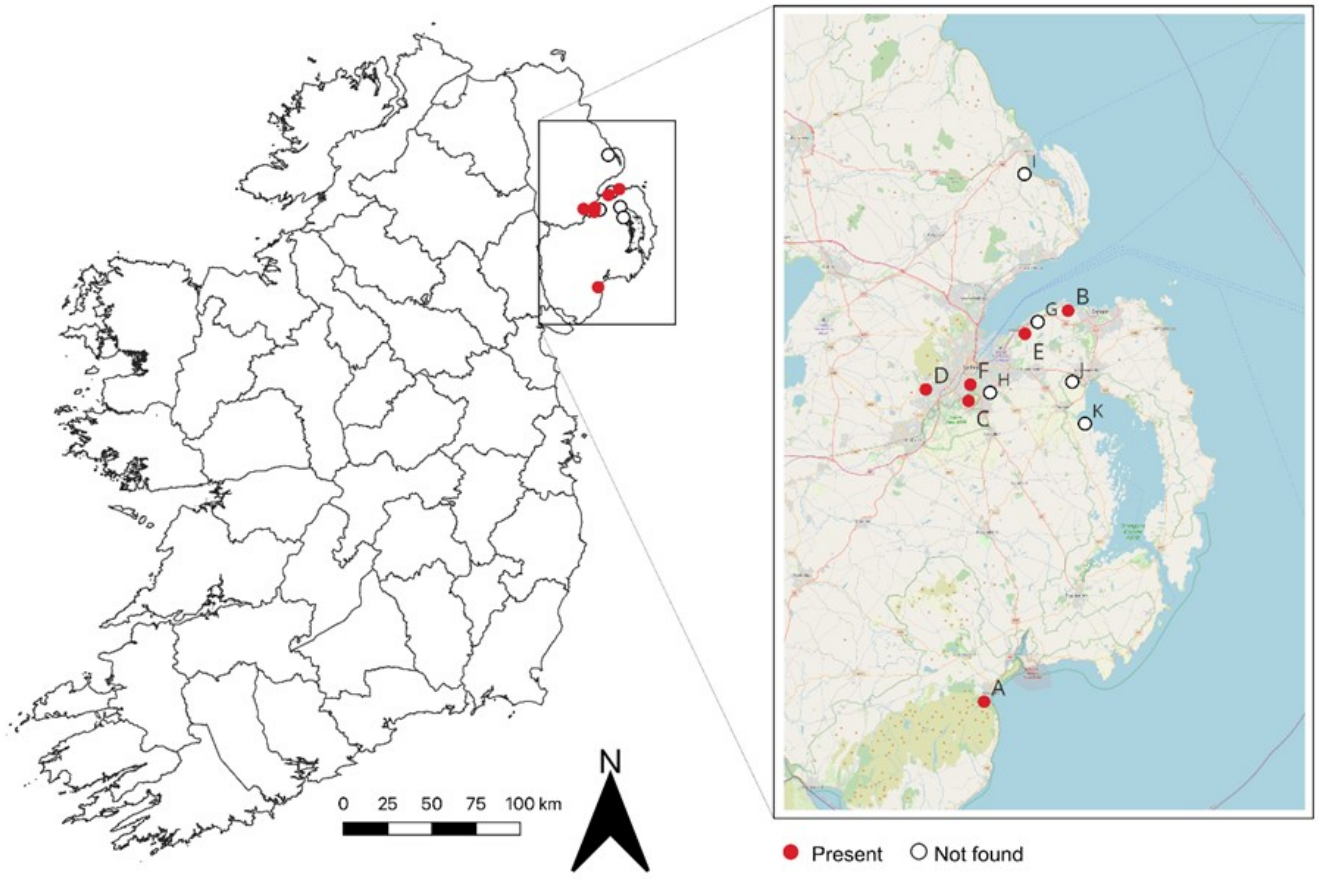

Fig. 7. Current known distribution of *Xenosacalles irlandikos* in Ireland. Red circles mark sites where the species has been found. White circles mark woodlands where this species has not yet been found after searches. **A –** Donard Park**, B** – Crawfordsburn Country Park, **C**- Belvoir Park Forest, **D** – Colin Glen, **E** – Glenlyon, **F** - Stranmillis Embankment, **G** – Ulster Folk and Transport Museum, **H** – Cregagh Glen, **I** – Glynn River, **J** – Killynether Forest, and **K** – Castle Espie (Map: Clarke).

Compiled observations on the bionomy of *Xenosacalles irlandikos*

Sixty-nine *X. irlandikos* (Fig. 8) have been observed across six sites in Northern Ireland (Fig. 7; Table 1), with most from Crawfordsburn Country Park. Roy Anderson had initially found two of the same undetermined cryptorhynchine weevils in Donard Park on 31 December 2011 and 9 January 2012. Independently, Joshua J. R. Clarke photographed a specimen at Crawfordsburn on 10 September 2022, and collected specimens on 14 January 2023 and 19 February 2023. Anderson noted upon comparison that these specimens with a raised scutellum, a decade part, were morphologically identical. Survey effort from September 2022 to February 2024 allowed us to build up an anecdotal and preliminary profile of their ecology and phenology. However, it has also highlighted key gaps in our knowledge such as origins and host plant associations. Three native cryptorhynchine weevils are present in Ireland: *Acalles misellus* Boheman, 1844, *Acalles ptinoides* Marsham, 1802, and *Kyklioacalles roboris* Curtis, 1835. They are typically considered uncommon to scarce across Ireland (Alexander and Anderson 2012), perhaps due to lack of good quality native or ancient woodland, which is often fragmented or degraded.

Table 1 First records of *Xenosacalles irlandikos* at each site, and locations of all sites searched based on habitat features outlined in text.

Site (map)	Latitude, Longitude	First site record	Description of first record location
Donard Park (Fig. 7A)	54.199776, -5.8965492	R. Anderson, 31 December 2011	Conifer plantation, found on bark of fallen *Abies alba* Mill.
Crawfordsburn Country Park (Fig. 7B)	54.663538, -5.7322562	J.J.R. Clarke, 10 September 2022	Woodland glen, on wooden fence over river
Belvoir Park Forest (Fig. 7C)	54.557319, -5.9345806	J.J.R. Clarke, 5 August 2023 (morning)	Mixed woodland, designated site, forestry activity, on hiking trail marker
Stranmillis Embankment (Fig. 7D)	54.575905, -5.9316087	J.J.R. Clarke, 5 August 2023 (night)	Urban, on metal railing
Colin Glen (Fig. 7E)	54.571418, -6.0220649	S. Rosell, 5 November 2023	Woodland glen, on hiking trail marker
Glenlyon Park (Fig. 7F)	54.638417, -5.8231831	S. Rosell & J.J.R. Clarke, 1 January 2024	Woodland glen, on wooden fence along river
Cregagh Glen (Fig. 7G)	54.566725, -5.8907533		Searched by J.J.R Clarke, but no records
Ulster Folk and Transport Museum (Fig. 7H)	54.649368, -5.7920909		Searched by J.J.R Clarke, but no records
Glynn River (Fig. 7I)	54.823041, -5.8228397		Searched by S. Rosell, but no records
Killynether Forest (Fig. 7J)	54.576141, -5.7230616		Searched by S. Rosell, but no records
Castle Espie (Fig. 7K)	54.529661, -5.6924200		Searched by S. Rosell, but no records

Fig. 8. *In-situ* photographs of *Xenosacalles irlandiko*s on wooden hand rails or hiking trail markers **A** – Crawfordsburn Country Park, 10 September 2022, **B** – Belvoir Park Forest, 5 August 2023, **C** – Characteristic raised scutellum, 29 September 2023, **D** – Curling up into defensive posture, 29 September 2023, **E** – dulled specimen, not as vibrant but still distinct, 19 February 2023, **F** – Wide-angled shot of weevil from 10 September 2022. (Photos: Clarke)

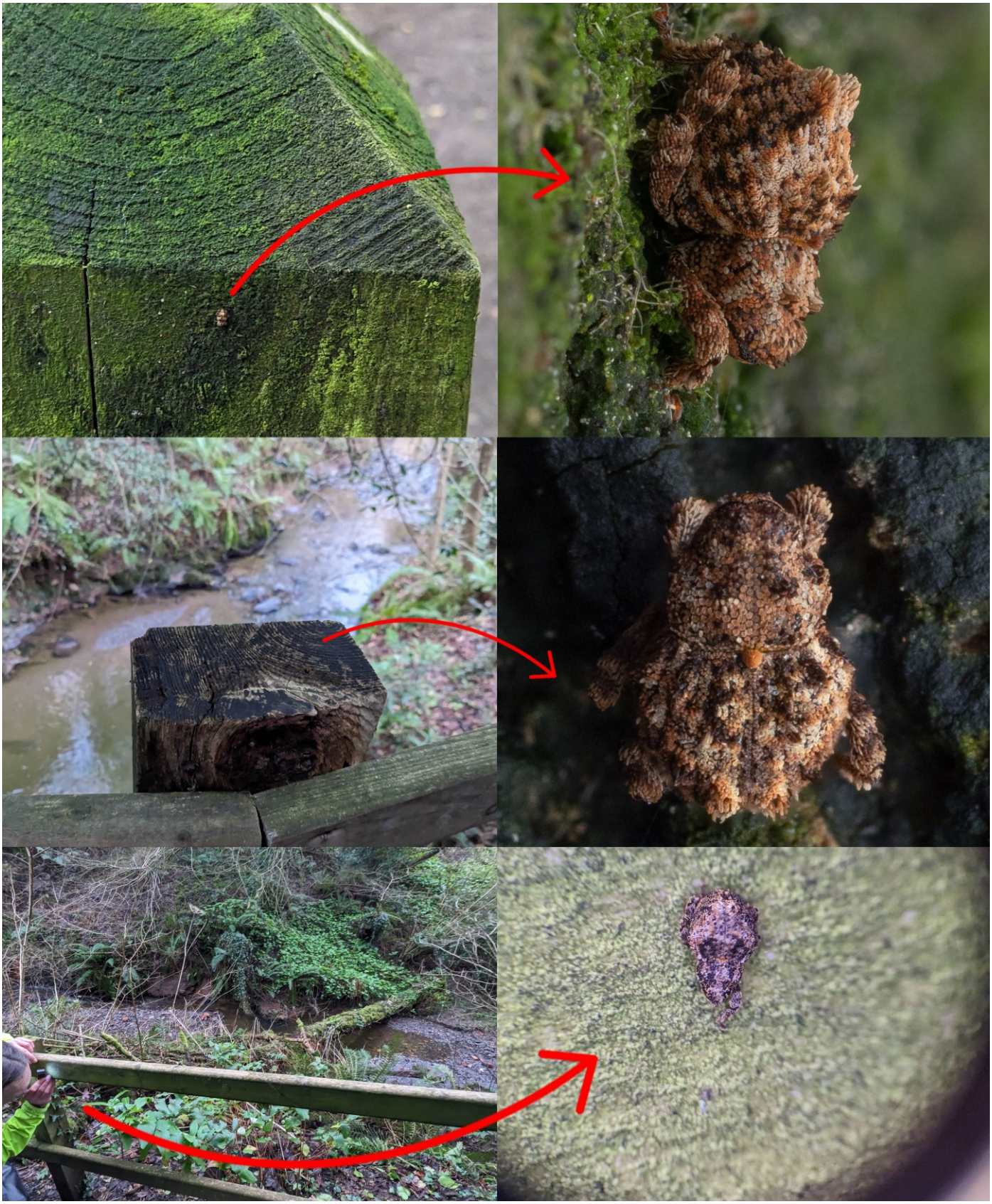

Fig. 9. Wooden handrails and hiking trail markers where *X. irlandikos* has typically been found. **TOP** – hiking trail marker in Belvoir Park Forest, **MIDDLE** – old wooden post joining newer fence posts at Crawfordsburn Country Park, and **BOTTOM** – typical wooden fence found throughout managed woodland with survey method used to find *X. irlandikos*, Glenlyon Park. (Photos: Clarke)

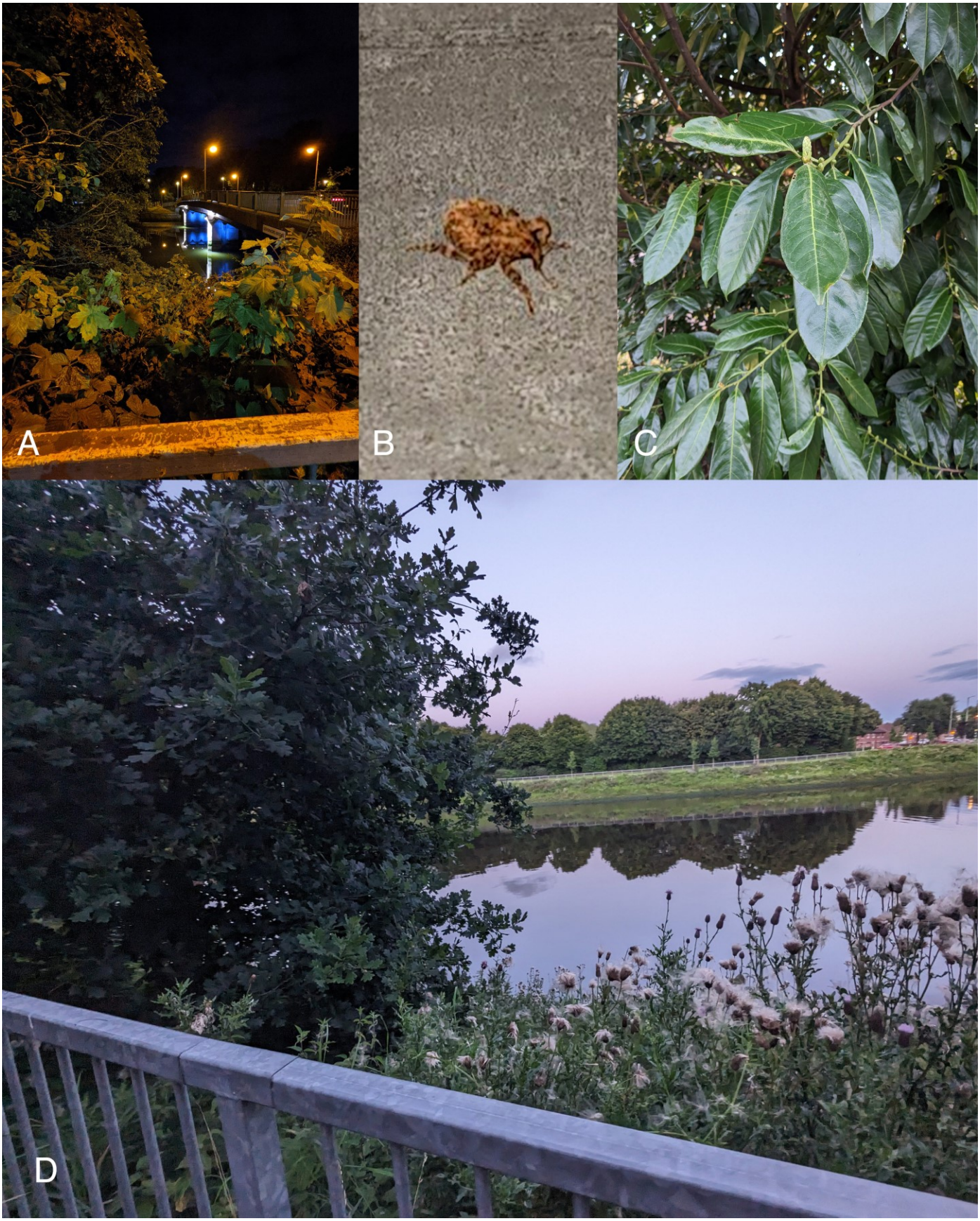

Fig. 10. Urban location of *X. irlandikos* at Stranmillis. **A** – artificial lights, tungsten, **B** – the single weevil, **C** – Presence of *Prunus laurocerasus*, **D** – Same habitat earlier in the day. (Photos: Clarke)

Fig. 11. Habitats and habitat features associated with observed *Xenosacalles irlandikos* during the September 2022 – February 2024 survey period. **A** – Belvoir Park Forest, highlighting woodland with stream and isolated wooden hiking trail marker in centre, **B** – Glenlyon Park highlighting presence of a wooden fence, river or stream, and *Prunus laurocerasus*, **C** – Colin Glen, highlight a woodland glen, **D** – Crawfordsburn Country Park, and further example of habitat features, **E** – typical wooden fence post to find a weevil overlooking Crawford's Burn, **F** – *Prunus lusitanica* L. within habitat, **G** – *Prunus laurocerasus* L. within habitat, and **H** – typical survey method of torchlight on wooden fence. (Photos: Clarke)

Crawfordsburn is a woodland glen with a diverse history. Trees from the Americas such as *Hesperocyparis macrocarpa* (Hartw.) Bartel and *Thuja plicata* Don ex D. Don were imported during the Victorian era (Masefield 2011). Since 1971 it has been managed by Northern Ireland Environment Agency. The Crawford's Burn, a river, flows through a largely deciduous woodland with trees including *Fagus sylvatica* L., and *Corylus avellana* L. at either side. Non-native conifers such as *Larix sp.* Mill., and non-native shrubs such as *Prunus laurocerasus* L. and *Prunus lusitanica* L. are present. The trails through the woodland and alongside the river are lined with wooden fences of mixed origins and construction dates. Typically, these are made from soft wood from Scandinavia (pers. comm. with a local timber supplier) with rougher fencing of possible Irish origin, and an older section that is of unknown origin.

Donard Park, site of the 2011 and 2012 records, comprises nineteenth century plantation woods taken over by the Forest Service Northern Ireland in the 1920s. The original mixed coniferous/broadleaf woods were then extensively planted with conifers including *Pinus sylvestris* L.*, Pinus nigra* J.F. Arnold with smaller stands of *Abies alba* Mill. Areas of the latter species have been damaged by wind-throw and numerous decayed trunks now lie on the ground. Anderson surveyed this site on 31 December 2011 and 9 January 2012 to explore loose bark of fallen fir, examining for hibernating insects. Numerous saproxylic beetles were recorded, including 2 unidentified cryptorhynchine weevils across both dates, now determined as *X. irlandikos*.

Wooden handrails or hiking trail markers in damp woodland (Fig. 9) have provided 63 out of the 69 *X. irlandikos* records. A small proportion had been found directly on trees, 2 on *A. alba* Mill. at Donard Park during daytime, and 1 each on *F. sylvatica* L., *C. avellana* L., and *Acer pseudoplatanus* L. all at Crawfordsburn during night-time surveys. One *X. irlandikos* was found at an urban site on a metal railing (Fig. 10). At four of the confirmed sites, several habitat characters were shared: 1) a woodland glen or woodland with a river/stream flowing through; 2) presence of wooden structures used as handrails or hiking trail markers, and 3) abundance of non-native shrubs including *P. laurocerasus* L. present near site (Fig. 11). All sites shared having high human activity, from recreation to industry. Due to fences and hiking trail markers being softwood, and records from 2011 - 2012 present in a conifer plantation, this is an association to explore in greater detail.

The urban record on a metal railing on the Stranmillis Embankment, beside the River Lagan, is an anomaly as it lacks a consistent canopy of trees (Fig. 10). The only feature shared with other recent sites surveyed is the presence of *P. laurocerasus* L., though no direct association observed. An argument for *X. irlandikos'* presence here could be that it was transported by the river, which does connect to Belvoir and Colin Glen, two other nearby confirmed sites. Dispersal of flightless Cryptorhynchinae via host plant fragments in water has previously been proposed (Stüben, Schütte & Astrin 2013).

Of the 69 *X. irlandikos* recorded, 48 specimens could be sexed (not all of which were included in the type series as they are now in different collections) showing female-bias with 40 females and 8 males. Males were encountered during October and November (Fig. 12). Adult *X. irlandikos* have been observed from August to February inclusive, with peaks during two night-time surveys: 15 November 2023 with 30 specimens and 2 February 2024 with 14 specimens (Fig. 13). Both survey nights had high humidity. Climate parameters, specifically a period of rain preceding surveys have been suggested to influence activity of flightless saproxylic Curculionidae (Cateau, Courtin & Brustel, 2016). The November and February surveys involved searching wooden fences, leaf litter, woody debris, tree trunks, and shrubs, by torchlight and beating vegetation. Future research will need to be more rigorous in measuring climate parameters and sex ratio for any conclusions to be drawn.

Currently, it is difficult to infer geographic origin and a clear introduction pathway or host association for this species. Wood used as handrails or hiking trail markers have provided most records, with few found on trees (Fig. 14). More woodland habitats will need to be surveyed. Introduction pathways in this region have included the horticulture and timber trade (Lucy *et al.*, 2020). Belfast is now home to many introduced invertebrates across a wide geographic area, from North America to New Zealand *e.g., Euophyrum confine* Broun, 1881 (Anderson, 1985), *Harmonia axyridis* Pallas, 1773 (Brown *et al.*, 2018), *Tomosthethus nigritus* Fabricius, 1804 (Jess *et al.* 2017; Soldi *et al.,* 2021), numerous terrestrial flatworms (Jones & Boag, 1996), and plant pests (Smith *et al.,* 2007). *Xenosacalls irlandikos* probably originates from outside of the Western Palaearctic as barcodes and specimens from the region are widely available with no close relatives (Stüben, 2018). All records of *X. irlandikos* except those at Donard Park, are within 12 miles of Belfast docks, and all sites close to transport infrastructure, such as railways.

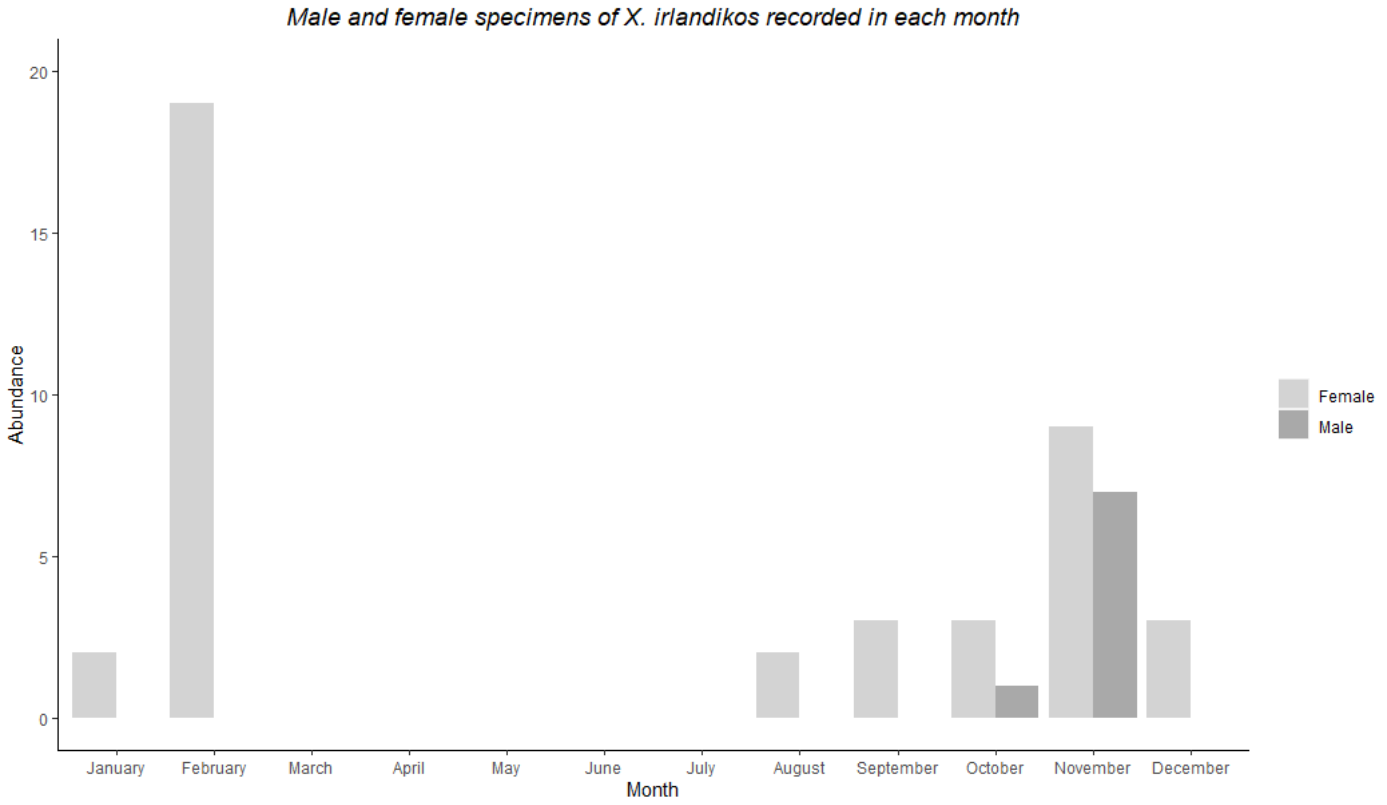

Fig. 12. Preliminary data of 48 *Xenosacalles irlandikos* specimens that could be determined as female or male across all sites (Figure: Rosell)

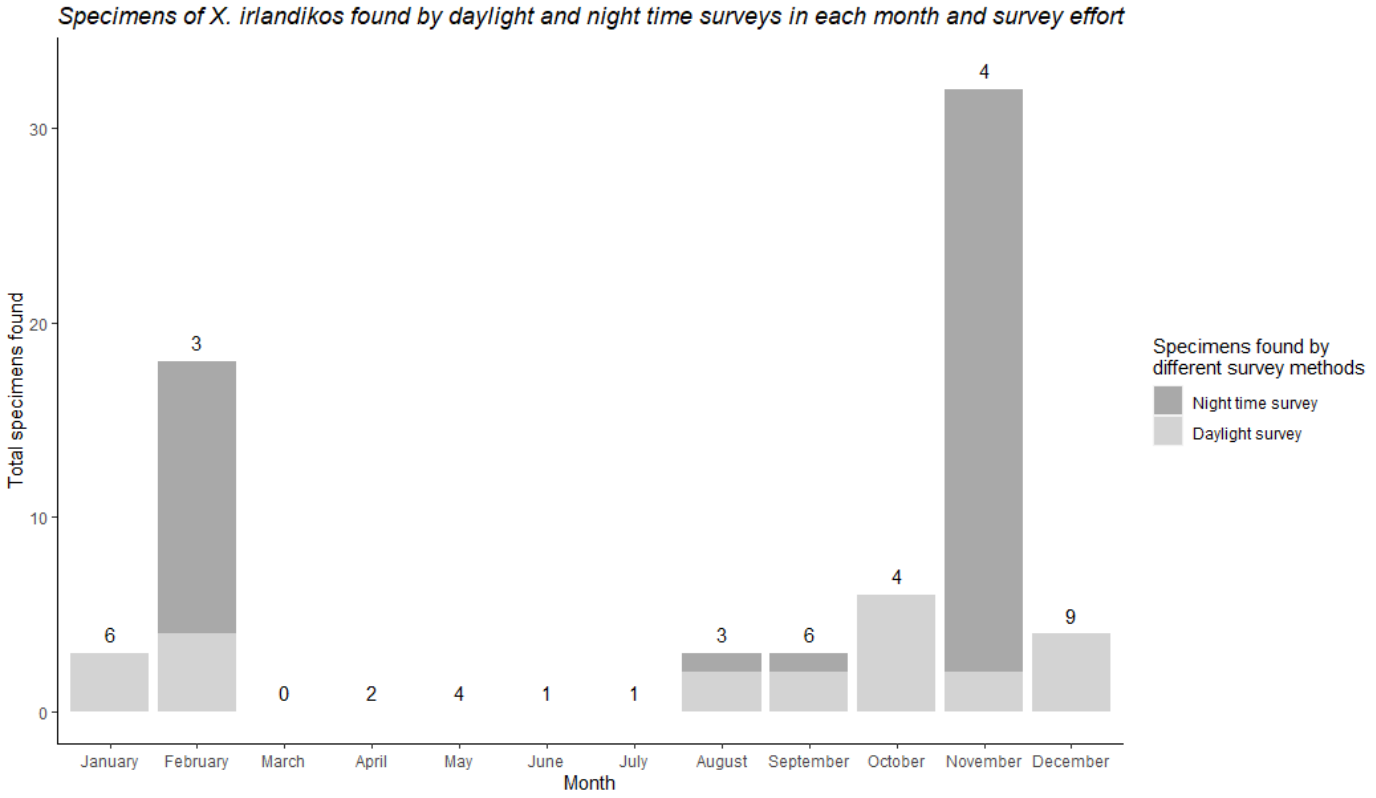

Fig. 13. Preliminary phenology of *Xenosacalles irlandikos* from combined survey effort across all sites, with darker bars referring to night-time survey and lighter, daytime surveys. Numbers above bars show the survey effort in each month. (Figure: Rosell)

There is much to discover about the habitat preferences, phenology, life history, and ecological interactions with native species following this novel cryptorhynchine weevil discovery. Only adults have been found so far with no knowledge of the larvae. The information and survey approaches summarised here provide necessary basis for future research to fill these knowledge gaps. The COI barcode sequences (appendix 1) and scaled 3D model (appendix 2) provide further resources to research the higher classification of this species and its true origin.

References

Alexander, K. N. A. & Anderson, R. (2012): The beetles of decaying wood in Ireland. A provisional annotated checklist of saproxylic Coleoptera. (Vol. No. **65**): National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Anderson, R. (1985): Some recent Irish records of *Euophryum confine* Broun (Col., Curculionidae). - *Entomologist's monthly Magazine* **120**: 216.

Brown, P. M., Roy, D. B., Harrower, C., Dean, H., Rorke, S. & Roy, H. (2018): Spread of a model invasive alien species, the harlequin ladybird *Harmonia axyridis* in Britain and Ireland. *Scientific data,* **5** (1): 1-8.

Cateau, E., Courtin, O. & Brustel, H. (2016): How and when should flightless, saproxylic, litter-dwelling coleoptera be surveyed? *Insect Conservation and Diversity, 9*(4), 282-289. Retrieved from <Go to ISI>://WOS:000379612500003. doi:10.1111/icad.12165

Citizen Conservation (2024): *Stopping the extinction of species / Das Artensterben stoppen.* Retrieved from https://citizen-conservation.org

Jess, S., Murchie, A., Allen, D. & Crory, A. (2017): First observation of *Tomostethus nigritus* (Fabricius) (Hymenoptera: Tenthredinidae) on urban ash trees in Ireland. *The Irish Naturalists' Journal* **35** (2): 134-136. Retrieved from http://www.jstor.org/stable/44577844.

Jones, H. & Boag, B. (1996): The distribution of New Zealand and Australian terrestrial flatworms (Platyhelminthes: Turbellaria: Tricladida: Terricola) in the British Isles—the Scottish survey and MEGALAB WORMS. *Journal of Natural History* **30** (7): 955-975.

Lucy, F. E., Davis, E., Anderson, R., Booy, O., Bradley, K., Britton, J. R. Crane, K. *et al.* (2020): Horizon scan of invasive alien species for the island of Ireland. *Management of Biological Invasions* **11** (2): 155-177.

Lyal, C. H. C. (1993): *Cryptorhynchinae (Insecta: Coleoptera: Curculionidae)*. Vol. **29**. Lincoln, N.Z.: Manaaki Whenua Press.

Masefield, R. (2011): Natural History and Other Aspects of Local Interest Crawfordsburn Country Park. In: Masefield, R. (ed.) *Twixt Bay & Burn: A History of Helen's Bay & Crawfordsburn.* Ireland: Bayburn Historical Society, pp. 144-149.

Papp, C. S. (1979): An illustrated Catalogue oft he Cryptorhynchinae of the New World. State of California: 461 pp.

Smith, R. M., Baker, R. H., Malumphy, C. P., Hockland, S., Hammon, R. P., Ostojá-Starzewski, J. C. & Collins, D. W. (2007): Recent non-native invertebrate plant pest establishments in Great Britain: origins, pathways, and trends. *Agricultural and Forest Entomology* **9** (4): 307-326.

Soldi, E., Fuller, E., Tiley, A. M., Murchie, A. K. & Hodkinson, T. R. (2021): First report of the ash sawfly, *Tomostethus nigritus*, established on *Fraxinus excelsior* in the Republic of Ireland. *Insects* **13** (1): 6.

Stüben P. E. (2024): New species of *Kyklioacalles* Stüben, 1999 from Majorca (Curculionidae: Cryptorhynchinae) and a first attempt to expand the integrative taxonomy to include the 3D scanning – *Weevil News*, No. **112**: 7 pp.

Stüben, P. E. (2018): The Cryptorhynchinae of the Western Palearctic. – Die Cryptorhynchinae der Westpaläarktis (Coleoptera: Curculionidae). *Curculio Institut, Mönchengladbach. Seitenangabe fehlt.*

Stüben, P. E., Schütte, A. & Astrin, J. J. (2013): Molecular phylogeny of the weevil genus *Dichromacalles* Stüben (Curculionidae: Cryptorhynchinae) and description of a new species. *Zootaxa* **3718** (2): 101-127.

Zimmerman, E. C. (1992): Australian Weevils (Col.: Curculionoidea), Vol. **VI**, Colour Plates 305-632, 707 pp.

Fig. 14. Top – *Xenosacalles irlandikos* thoroughly investigating a hole in wooden fence post *in situ* (Photo: Clarke), **Bottom grid** – *Xenosacalles irlandikos* in action, but it did not stay long on the buds of a beech branch. The species seems to prefer wooden fences near Belfast (Photos: Stüben)

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Author Contributions

Peter E. Stüben described this species, both morphologically and molecularly, and compared to reference material. Joshua J. R. Clarke and Roy Anderson independently discovered first records. Both Joshua J. R. Clarke and Stewart Rosell developed survey methods and carried out fieldwork. All authors contributed to manuscript content and discussion.

Appendix 1

> *Xenosacalles irlandikos*: Northern Ireland, Crawfordsburn Country Park, 4044-PST

AACTTTATACTTCATCTTTGGATCATGATCAGGAATAGTAGGAACATCCCTGAGTATGTTAATTCGGACTGAGTTAGGCACCCCAGGAACACTAATTGGAAATGACCA
AATTTACAATTCAATTGTAACAGCACACGCTTTCATTATAATCTTCTTTATAGTTATACCGATTATAATTGGAGGATTTGGAAATTGATTAGTTCCCCTTATATTAGGGGC
CCCAGATATAGCATTCCCCCGTCTTAACAATATAAGATTTTGACTTCTACCGCCATCATTAACACTTCTTTTAATAAGAAGAATCATTGATAAAGGAGCAGGAACAGGG
TGAACCGTCTACCCCCCCCCTATCTTCAAATATTGCCCATGAAGGAGCCTCTGTAGATTTAGCCATCTTCAGACTACATATAGCAGGAATTTCATCAATCCTAGGAGCA
ATAAATTTTATTTCTACTGTACTAAATATACGACCAACAGCTATAAGACCCGACCAAATACCTTTATTTACTTGAGCTGTAAAAATCACAGCTATTTTATTACTCCTTTCA
CTTCCAGTTCTTGCCGGAGCAATTACTATATTATTAACTGATCGAAATATTAATACATCTTTCTTTGATCCTGCAGGAGGAGGAGACCCTATTTTATACCAACACTTATT
T

> *Xenosacalles irlandikos*: Northern Ireland, Colin Glen Forest, near river 4045-PST

AACTTTATACTTCATCTTTGGATCATGATCAGGAATAGTAGGGACATCCCTGAGTATGTTAATTCGGACTGAGTTAGGCACCCCAGGAACACTAATTGGAAATGACCA
AATTTACAATTCAATTGTAACAGCACACGCTTTCATTATAATCTTCTTTATAGTTATACCGATTATAATTGGAGGATTTGGAAATTGATTAGTTCCCCTTATATTAGGGGC
CCCAGATATAGCATTCCCCCGTCTTAACAATATAAGATTTTGACTTCTACCGCCATCATTAACACTTCTTTTAATAAGAAGAATCATTGATAAAGGAGCAGGAACAGGG
TGAACCGTCTACCCCCCCCCTATCTTCAAATATTGCCCATGAAGGAGCCTCTGTAGATTTAGCCATCTTCAGACTACATATAGCAGGAATTTCATCAATCCTAGGAGCA
ATAAATTTTATTTCTACTGTACTAAATATACGACCAACAGCTATAAGACCCGACCAAATACCTTTATTTACTTGAGCTGTAAAAATCACAGCTATTTTATTACTCCTTTCA
CTTCCAGTTCTTGCCGGAGCAATTACTATATTATTAACTGATCGAAATATTAATACATCTTTCTTTGATCCTGCAGGAGGAGGAGACCCTATTTTATACCAACACTTATT
T

Appendix 2

With the attached scaled model, measurements can also be carried out on the model using suitable programs. The unit of measurement is in millimeters (mm). *Xenosacalles irlandikos* can also be printed via the OBJ file (which can also be converted into an STL file) to get a first impression of the paratype, a female, and to use it for further morphological studies (Fig. 15). Link to the electronic supplement (ZIP-file): https://www.curci.de/?wnsupplement=113

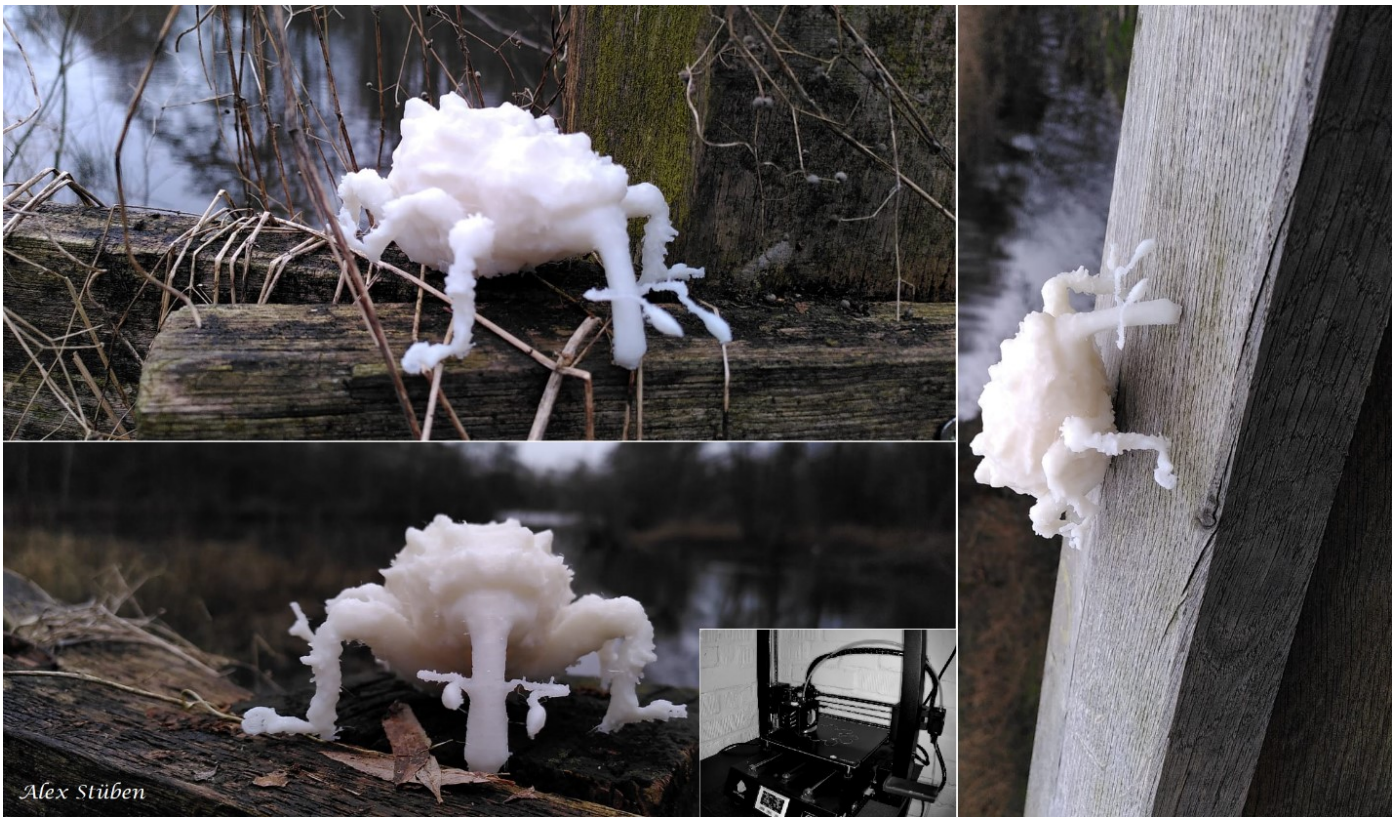
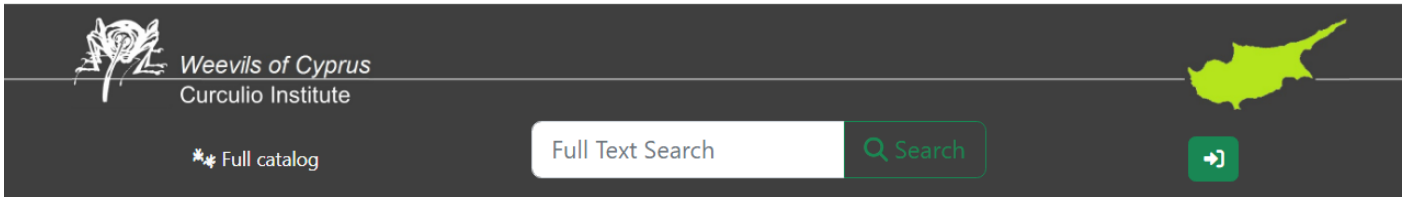
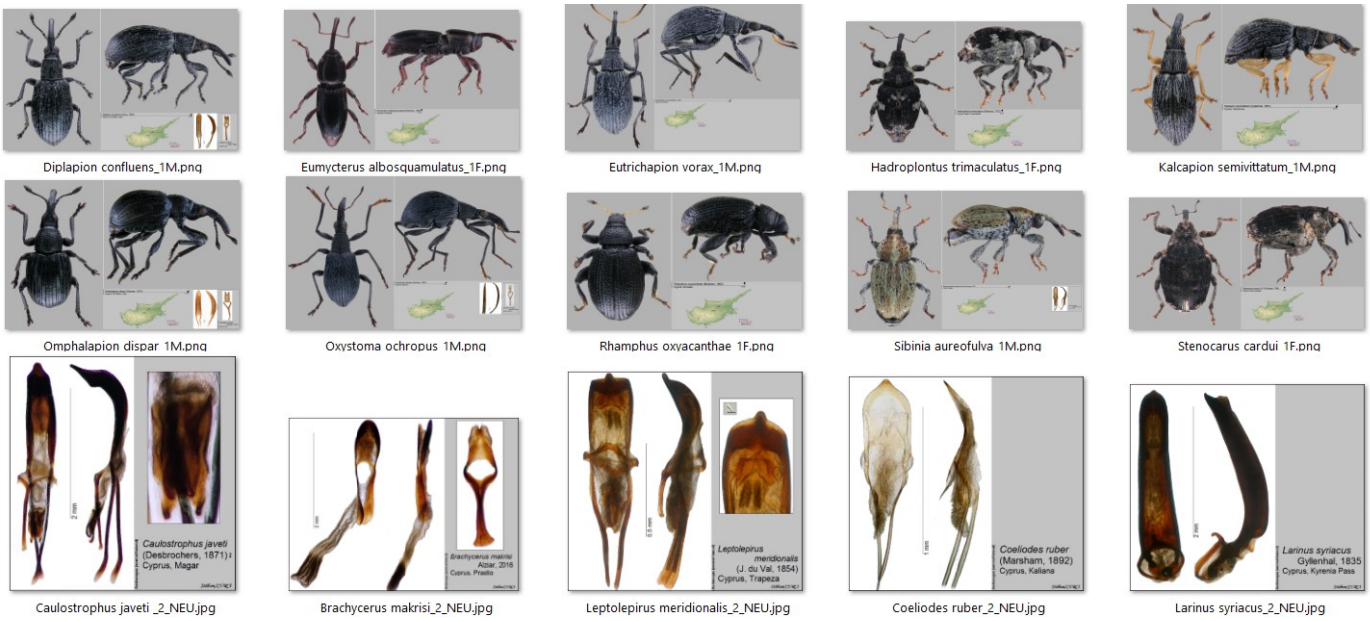


Fig. 15. Highly magnified 3D model as a printout of a paratype (female) of *Xenosacalles irlandikos* (which every reader of the article can print out as a small replacement for the type material). As the reconstruction shows, the Irish-German team would like to give the new species the common name "**Fence-climber Acalles**" (in German: **Zaunkletter-Acalles**). 3D printing and photo by Alex Stüben.



Stüben, P.E. & Jacob, R. (2023…). Weevils of Cyprus - an image catalogue. - Le Charançon. Catalogues & Keys No. **6**, Curculio-Institute, Mönchengladbach, Germany. ISSN 1864-0699.

On October 1, 2023, our new catalog with high-resolution images of the currently 345 weevils of Cyprus was published and has since been updated. In addition to the first descriptions and further literature, the catalog contains photos of weevils on their host plants, focus stacking photographs of the habitus, aedeoagus and other morphological features. All records compiled by us are presented in distribution maps as well as current changes in taxonomy (e.g. systematic position and synonyms), information on the host plants or new molecular results (e.g. barcodes). Further comments and discussion contributions on almost every species round off this encyclopedia, which also contains references to current keys and goes far beyond the usual catalog compilations!



All this is initially a pilot project - imitators who have mastered macro photography are being sought for other regions and topics!

Have you always wanted to share the weevils of your region, your favorite group or of a plant family in words and pictures to interested parties on the Internet? Then you should use our **standardised CURCI catalogs**, which are available on the CURCI website in our online magazine **Le Chrançon (**from issue 6).

- **Taxa catalogs**: the weevils of your interest at any taxonomic level, from genus to subfamily;
- **Fauna catalogs:** The weevils of your region, your department, your vacation destination or favorite island;
- **Host plant catalogs:** the weevils of different plant families (e.g., on Fabaceae, Rosaceae, Brassicaceae, or Carduoideae);
- **Biotope catalogs:** the weevils of a habitat or vegetation zone (e.g. on dry meadows, in and around water bodies or deciduous forests).

Please do not hesitate to contact us. Apply for space on our catalog 'Le Chrançon'. We already have a project planning sheet and a catalog instruction video ready for you. A completely redesigned "off-the-shelf" blank catalogue (that you can fill from day one) is already waiting for you. We will be happy to help and advise you throughout your catalog journey, if you wish.

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