

Dermestes undulatus Brahm rediscovered
in Wales – and its differentiation from
Dermestes murinus Linnaeus (Coleoptera:
Dermestidae)

Article

Accepted Version

Holloway, G. J. ORCID: <https://orcid.org/0000-0003-0495-0313>, Owen, C. and Tordoff, G. (2024) *Dermestes undulatus* Brahm rediscovered in Wales – and its differentiation from *Dermestes murinus* Linnaeus (Coleoptera: Dermestidae). *Entomologists Monthly Magazine*, 160 (4). pp. 283-286. ISSN 0013-8908 doi: 10.31184/M00138908.1604.4239 Available at <https://centaur.reading.ac.uk/123936/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

Identification Number/DOI: 10.31184/M00138908.1604.4239
<<https://doi.org/10.31184/M00138908.1604.4239>>

Publisher: Pemberley Books

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in

the [End User Agreement](#).

www.reading.ac.uk/centaur

CentAUR

Central Archive at the University of Reading

Reading's research outputs online

***Dermestes undulatus* (Coleoptera: Dermestidae) rediscovered in Wales and its differentiation from *Dermestes murinus*.**

BY GRAHAM J. HOLLOWAY, CHRISTIAN OWEN & GEORGE TORDOFF

GJH*: *Cole Museum of Zoology, School of Biological Sciences, HLS Building, The University of Reading, Whiteknights, Reading RG6 6EX; email: g.j.holloway@reading.ac.uk*

CO: *75 Lewis Street, Aberbargoed, Mid-Glamorgan, South Wales, CF819DZ; email: christian.owen49@yahoo.com*

GT: *82 College Road, Llandaff North, Cardiff, CF14 2NX; email: georgetordoff@hotmail.com*

ORCID ID (GJH): <https://orcid.org/0000-0003-0495-0313>

ORCID ID (GT): <https://orcid.org/0000-0003-0067-2184>

*corresponding author

ABSTRACT

Dermestes undulatus is a scarce species in the UK. Here we report on the rediscovery of *D. undulatus* from southern Wales, specifically the island of Flat Holm. The historic and current distribution of *D. undulatus* in the UK is explored. *Dermestes undulatus* sits within the subgenus *Dermestinus*, along with *D. murinus*. The differentiation of *D. undulatus* from *D. murinus* is considered.

Keywords: hide beetle, distribution, *lardarius*, United Kingdom, identification, recording

INTRODUCTION

Holloway (2023) examined the checklist of *Dermestes* Linnaeus, 1758 species on the British list, concluding that only six species should be included. Of these six species, three belong within the subgenus *Dermestes* (*D. lardarius* Linnaeus, 1758, *D. haemorrhoidalis* Küster, 1852, *D. peruvianus* Laporte de Castelnau, 1840) and three belong within the subgenus *Dermestinus* Zhantiev, 1967 (*D. maculatus* DeGeer, 1774, *D. murinus* Linnaeus, 1758, *D. undulatus* Brahm, 1790). Holloway (2023) used Duff's (2018) self-sustaining population criterion for inclusion onto the British list. This criterion could include species that breed largely indoors. Three of the species listed above have entered the UK probably many times on imported commodities and have subsequently established themselves indoors, meaning that only three species, *D. lardarius*, *D. murinus*, and *D. undulatus* are truly native.

Dermestes undulatus is globally a widely distributed species occurring throughout the entire Holarctic region (Mroczkowski 1968). In the UK, however, it is a scarce species that could be declining (Peacock 1993). It is listed as rare and vulnerable by Alexander (2017). Both *D. undulatus* and *D. murinus* belong to the same subgenus, *Dermestinus*, and are fairly similar to

each other. The purpose of the current study is to examine ways of differentiating between the two species for recording purposes, and to consider the distribution of *D. undulatus* in the UK.

METHODS

Adults were noted on Flat Holm, Wales (ST221649) by two of us (CO and GT) during a three-day Bioblitz (8th – 10th September 2023) on the island organized by Southeast Wales Biodiversity Records Centre in conjunction with Cardiff City Council and Flat Holm (Cardiff Harbour Authority and Flat Hom Island team). Six adults and a late-stage larva were sent to GJH to establish a breeding population and to confirm identification. Adult insects were provided with dry chicken flesh, feathers, and crushed whole cereal grain as a breeding medium.

Dissection was carried out under a Brunel BMSL zoom stereo LED microscope and involved detaching the abdomen from the rest of the insect using two entomological pins. The soft tergites were peeled away from the harder ventrites to expose the genitalia. Habitus and sternite images were captured at ×10 magnification using a Canon EOS 2000D camera mounted on the BMSL microscope. After dissection, all body parts were mounted on card. The antennae were teased out and images were taken at ×63 magnification. Images were fed through Helicon Focus Pro focus-stacking software (version 8.2.2).

Distribution data were lifted from iRecord (2024) and NBN Atlas (2024), supplemented with old data provided by Peacock (1993). The distribution map was produced using SimpleMapper (Shorthouse 2010).

RESULTS AND DISCUSSION

Several Coleoptera species were found associated with dead juvenile lesser black-backed gulls *Larus fuscus* Linnaeus, 1758 along with *D. undulatus*, including *Aleochara bipustulata* Linnaeus, 1761, *Necrobia violacea* Linnaeus, 1758, *Nicrophorus humator* Gleditsch, 1767, *Nicrophorus vespillo* Linnaeus, 1758, *Omosita colon* Linnaeus, 1758, *Saprinus planiusculus* Motschulsky, 1849, and *Saprinus semistriatus* Scriba, 1790. *Dermestes undulatus* was one of the most common Coleoptera species on site and up to about 50 were found on and under every gull carcass examined. Four adult females and two males *D. undulatus* were received by GJH on 16th September 2023 (the larva later developed into an adult male). The adults lived indoors for about 3 months but failed to produce any offspring. On death, the specimens were dissected to confirm identification as *D. undulatus* (Herrmann 2024) (Fig. 1). There could be different explanations for the unwillingness of the insects to breed under laboratory conditions. They are collected in September, which is late but within the normal period that adults are found in the field (March – September, Peacock (1993)). One explanation is that adults need an overwintering period to completely mature, a period that might need to include low temperatures. They were kept at a fairly steady 20°C so were never exposed to low temperatures. Another possibility is that they need their food to be damp. The food offered to them in the laboratory was dry, similar to food and conditions provided for laboratory cultures of *D. maculatus* and *D. ater* DeGeer, 1774.

The only confusion species likely to be encountered out of doors and which belongs to the subgenus *Dermestinus* is *D. murinus* (Fig 2). Both *D. undulatus* and *D. murinus* are about the same size with body lengths 5-8 mm. The dorsal colour patterns (Figs 1A and 2A) are the

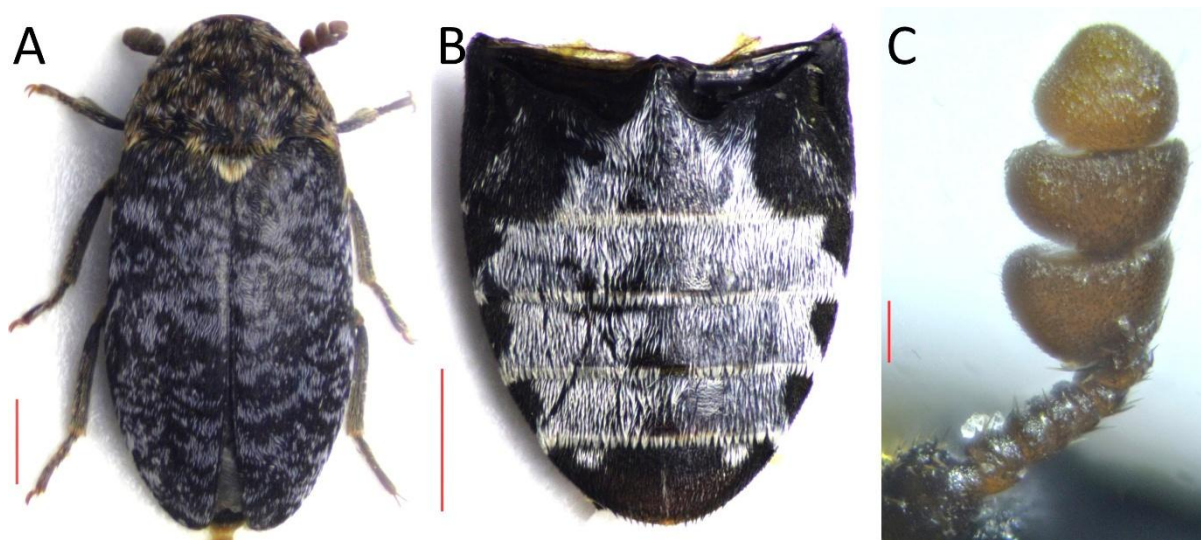


Fig. 1. *Dermestes undulatus* (Flat Holm, Wales, September 2023), A: Habitus (scale bar = 1 mm), B: sternites (scale bar = 1 mm), C: antenna (scale bar = 100 μ m).

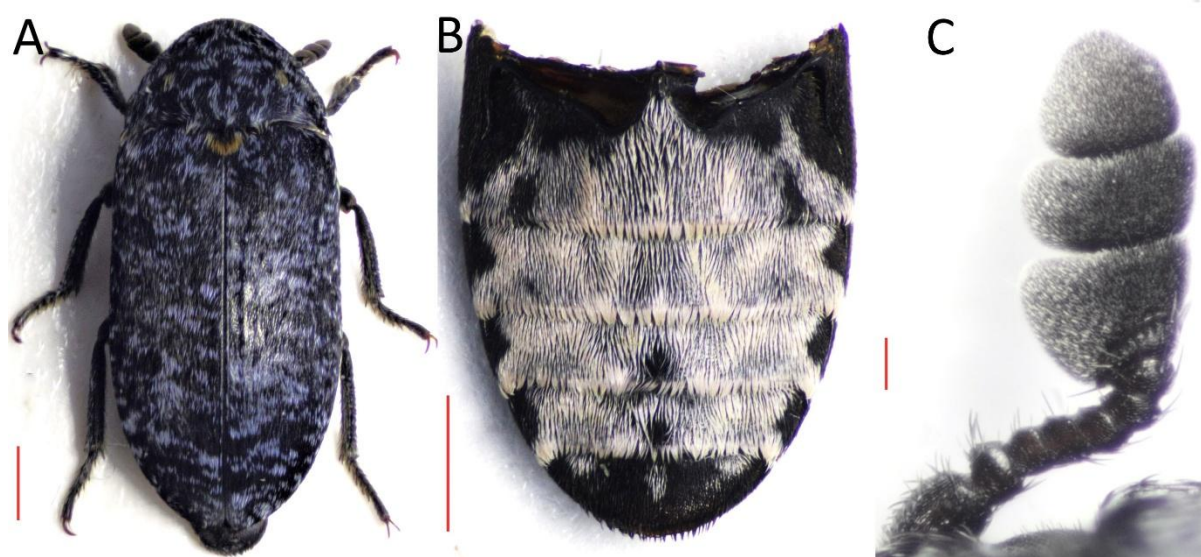


Fig. 2. *Dermestes murinus* (Silwood Park, April 2019), A: Habitus (scale bar = 1 mm), B: sternites (scale bar = 1 mm), C: antenna (scale bar = 100 μ m).

same, flecks of white scales on an otherwise black background, except that *D. undulatus* also has brown scales on the pronotum and (sometimes) the elytral base. *Dermestinus* species have white scales on the sternites. The patterns of these white scales (Figs 1A and 2A) differ between the species. In particular, the large patches devoid of white scales at the outer edges of sternite I are typical of *D. undulatus*. Sternite I is more extensively covered in white scales in *D. murinus*. Both species have obviously clubbed antennae with the club consisting of the terminal three antennomeres. The structures of the clubs are similar, but *D. undulatus* club is pale reddish brown and *D. murinus* club is very dark brown or black.

Fig 3 shows a map of recent and old records of *D. undulatus* from the UK. Most records are from the coast and there is little difference between the types of locations and distributions

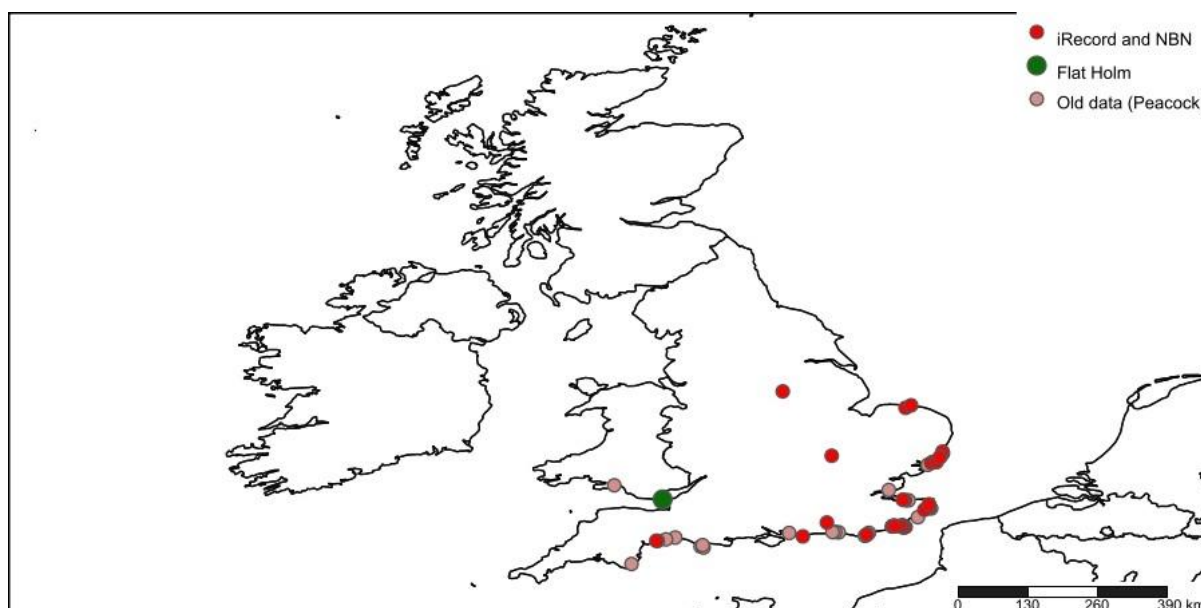


Fig. 3. Distribution of *Dermestes undulatus* in the UK, including Flat Holm, Wales record.

between old and new records. In short, there is little evidence that *D. undulatus* is becoming less frequent in the UK, although it should be noted that recording effort is probably higher now than in the past. Only three records occur away from coastal regions: Nottinghamshire, Bedfordshire and Sussex. It is possible that these records are geospatial errors or misidentifications, but either way they do not change the indication that in the UK *D. undulatus* is essentially a coastal species.

The Flat Holm record is indicated on Fig 3. Only twice before has *D. undulatus* been recorded in Wales, both times from Swansea. The first recording was from approximately 200 years ago, and thereafter approximately 100 years ago (Peacock 1993). Fig 3 shows that *D. undulatus* is distributed largely along the south and south-east coasts. The Flat Holm record is far removed from the distribution focus in the UK. It is possible that it is a relict population that has, to date, been overlooked, or it represents range expansion.

ACKNOWLEDGEMENTS

We are very grateful to Georgia Warren for making us aware of a record of *Dermestes undulatus* from a new site (Pagham Harbour, West Sussex) in July 2023.

REFERENCES

- Alexander, K.N.A.** 2017. A Review of the Status of the Beetles of Great Britain. The wood boring beetles, spider beetles, false powder-post beetles, hide beetles and their allies – Derodontoidea, (Derodontidae) and Bostrichoidea (Dermestidae, Bostrichidae and Ptinidae). Natural England Commissioned Reports, Number 236.
- Duff, A.G.** 2018. Checklist of Beetles of the British Isles. Third edition. Iver: Pemberley Books (Publishing).

Herrmann, A. 2024. Dermestidae (Coleoptera) of the World. Dermestidae (Coleoptera) - Homepage of Andreas Herrmann [accessed 1 January 2024].

Holloway, G.J. 2023. A review of *Dermestes* Linnaeus (Coleoptera: Dermestidae) species on the British list. *Entomologist's Monthly Magazine* **159**: 275-285.

iRecord 2024. Available from <https://irecord.org>. [accessed 1 January 2024].

Mroczkowski, M. 1968. Distribution of the Dermestidae (Coleoptera) of the world with a catalogue of all known species. *Annales Zoologici* **26**: 16-191.

NBN Atlas 2024. <https://species.nbnatlas.org/species/NBNSYS0000024280> [accessed 1 January 2024].

Peacock, E.R. 1993. Adults and Larvae of Hide, Larder and Carpet Beetles and their Relatives (Coleoptera: Dermestidae) and of Derodontid Beetles (Coleoptera: Derodontidae). Handbooks for the Identification of British Insects 5(3). London: Royal Entomological Society.

Shorthouse, D.P. 2010. SimpleMappr, an online tool to produce publication-quality point maps. <https://www.simplemappr.net>. [accessed 1 January 2024].