Aulacobaris caerulescens (J.A. Scopoli, 1763) (Curculionidae) established in Britain

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Whilst surveying a brownfield site near Manston, Kent (VC15) on May 6th 2020, Chris Kirby-Lambert swept a single shining blue *Aulacobaris* (Lea) from tall ruderal vegetation on a bank of rubble (**Fig. 1**). The genus *Aulacobaris* is moderately diverse in Europe but at the time only two species were known to be established in Britain, *Aulacobaris lepidii* (Germar) and *Aulacobaris picicornis* (Marsham), with a third, *Aulacobaris janthina* (Boheman), recorded as an unestablished introduction. Neither of our previously known native species is common, but *picicornis* is fairly frequently encountered on *Reseda lutea* (Wild Mignonette) and *Reseda luteola* (Weld) on dry sites in the south-east. *A. lepidii* is scarcer and associated with waterside Brassicaceae and floodplain grassland. The bank was composed of dry and disturbed soil and rubble mounds with moderate areas of bare ground and shorter ruderal vegetation between; large plants of *Malva* sp., *Ballota nigra* (Black Horehound), *Brassica nigra* (Black Mustard), *Smyrnium olusatrum* (Alexanders), *Reseda lutea* and *Reseda luteola* (Weld) were present.

Fig. 1. Original individual of *Aulacobaris caerulescens* collected near Manston, Kent.

The habitat and general habitus of the specimen lead to a provisional field identification as *A. picicornis*. However, the individual looked distinctly atypical so was taken for confirmation under a microscope. When examined under the microscope the specimen did not key comfortably to either known British species in either Duff (2016) or Morris (2012). The elytral shape was intermediate between the two species, the puncturation of the elytral intervals keyed towards *picicornis* whilst the pronotal puncturation keyed towards *lepidii*. Comparison with specimens of *A. picicornis* made it immediately clear that this was a different species. *A. lepidii* seemed extremely unlikely based on habitat alone and comparison with images of *lepidii* confirmed that the specimen was not this species.

The obvious answer was therefore that this was a continental species that had reached the site from the nearby French coast, only 53km away at its closest point. The site is close to the coastline, one of the highest areas in the local landscape, exposed in aspect and regularly experienced strong southerly winds during the survey period. Three species of planthopper (Heteroptera: Auchenorrhyncha) new to Britain were also recorded from the site during the survey so it seems to be a notable colonisation hotspot.

The specimen easily keyed out as *Aulacobaris caerulescens* (Scopoli) using Arved Lompe's online keys to European Coleoptera (https://coleonet.de/coleo/texte/aulacobaris.htm). This species is widespread in nearby coastal France and the Netherlands and feeds on various members of the Brassicaceae, including *Brassica nigra*, which was present on the bank from which it was swept. The specimen was shown to another entomologist, Peter Kirby, who reached the same identification using Hoffmann (1958), a key to the French Curculionidae. Unfortunately, due to the fact that the project from which the record was made was ongoing and potentially sensitive, the record could not be made public immediately. Despite further targeted searches of suitable habitat and food plants on the site, as well as fairly intensive continuing survey, no more individuals could be found, indicating that it was not yet well established.

Since the original discovery of the species, it has clearly become well established in southern England. It has now been recorded from nine locations across three vice counties. Graeme Lyons recorded the species five times whilst surveying arable margins covering four Tetrads in West Sussex, at the edge of the South Downs National Park in May 2022 and April and May 2023. A single individual was found on the underside of an *Asplenium scolopendrium* (Hart's-tongue Fern) frond in the Dean's Garden of Canterbury Cathedral in October 2022 by Tony Witts. James McGill recorded a single individual from sparsely vegetated shingle with *Ononis repens* (Common Restharrow) and *Trifolium arvense* (Hare's-foot Clover), at Sandwich Bay, East Kent on 22nd July 2023. A further two males were found on *Ononis repens* on a sand dune a little further up the coast on 14th September 2023. James McGill also identified a single female in a batch of samples collected by Johnnie Johnson from a garden in North Essex on 30th July 2023.

Table 1. summarises all known records of *A. caerulescens*.

Characters of *Aulacobaris* species

Mark Gurney provided further confirmation of the identification and an assessment of key characters for identification by checking James McGill's specimen and photos sent by Graeme Lyons against all the species in the world collection at the Natural History Museum. Both the specimen and the photos showed a unique combination of characters shared only with specimens of *caerulescens* in the NHM collection. The fine striae 7-9, fading out well behind the humeri are unusual in the genus, shared only with a specimen standing over *Aulacobaris atlasica* (Hustache) among the species in the collection. The following combination of features was not shown by any other species: fine striae; large, confluent punctures on sides of thorax; elytra like either *picicornis* or *lepidii*, usually somewhat intermediate. The elytra are not as bowed at the sides as in *lepidii*, but there is variation in this feature and MG found that it can be quite subtle and hard to detect. In a British context the fine striae and the confluent thorax punctures are the best identification features.

The key below should allow identification of the three species of *Aulacobaris* now recorded in Britain.

1. Punctures on the sides of the thorax are often coarse, but mostly isolated and never completely merged into longitudinal wrinkles. Elytra not strongly rounded, sides in the front half parallel sided. Body elongated oval. Pronotum closely punctate with ± round punctures, sometimes with a dot-free midline. Punctures on elytral intervals more confused with two or three punctures abreast in places. Topside blue-green or blue, pronotum often darker than elytra. 2.8-3.9 mm. On *Reseda luteola* and *Reseda lutea*.
...***picicornis*** (Marsh)

-- Punctures on the sides of the thorax large and confluent, merged into coarse longitudinal wrinkles. …. **2**

2. Elytral striae fine; the 7th to 9th striae broken towards the front and ending well before the humeri. Elytra narrows towards the tip more evenly, less rounded. Pronotum sparsely punctate with somewhat elongated punctures, a clearly puncture-free central longitudinal line always present. Upper surface shiny, blackish green, blue, bronze or violet. Elytral intervals with very fine rows of punctures. 2.3-4.5mm. On various cultivated and wild Brassicaceae.
…***caerulescens*** (Scopoli)

-- Elytral striae deep and very clear. Elytra strongly rounded, broadest in front of the middle. Humeri indistinct. Pronotum closely punctate with mostly elliptical punctures. Unicolorous dark blue-black or green-blue. 3.3-4mm. On a wide variety of wild Brassicaceae in wetland habitats (*Rorippa*, *Nasturtium*, *Barbarea* etc.). ...***lepidii*** (Germar)

Table 2 provides an alternative tabular means of identification. **Fig. 3** illustrates key identification features for British *Aulacobaris*.

Aulacobaris picicornis (Marsham)
This is the commonest species in Britain, although apparently considered quite rare on the continent. It is fairly frequent, although not common, in south-east England and East Anglia and probably expanding in range. It occurs in dry, open, calcareous habitats including brownfield sites, roadsides, waste ground and disturbed chalk and limestone grasslands where the food plants, *Reseda luteola* and *Reseda lutea* occur. The body is elongated oval in shape with the elytral sides very subtly curved. The pronotal punctures are dense and almost circular, sometimes with an unpunctured midline. Punctures on the sides of the thorax never merged into coarse longitudinal wrinkles. The punctures on the elytral intervals are more confused, with two or three punctures abreast in places. The dorsum is blue-green or blue with the pronotum often darker than the elytra. Surface rather dull. Tarsi sometimes brown-red. See **Fig. 3** for illustrations of identification characters. 2.8-3.9 mm.

Aulacobaris lepidii (Germar)
This species is widespread across England, with records from Kent to Devon and north to the Welsh Borders and north Midlands. It is very localised within this range however. It is similarly widespread but localised across Europe. It feeds on a wide variety of wild Brassicaceae, particularly *Rorippa palustris*, *Nasturtium officinale* and *Barbarea vulgaris* at the sides of water bodies, particularly slow-flowing rivers and streams, ditches, and marshes. Recent Sussex records have also indicated an association with wet floodplain grassland where Cuckooflower *Cardamine pratensis* is the likely foodplant (Graeme Lyons, pers. comm.). The elytra are strongly rounded, broadest in front of the middle, with distinctly curved margins and indistinct humeri. The elytral striae are deep and very clear. The pronotal puncturation is dense and mostly slightly elliptical. The punctures on the sides of the thorax are merged into coarse longitudinal wrinkles. The dorsum is unicolorous dark blue-black or green-blue and rather dull. See **Fig. 3** for illustrations of identification characters. 2.8-4mm.

Aulacobaris caerulescens (Scopoli)
This species is currently known from scattered locations in south-east England. It is a widespread species in Europe and generally considered to be the commonest *Aulacobaris* species throughout most of its range. It is known from France and the Low Countries, just across the English Channel and North Sea and from Southern and Central Europe. It feeds on various cultivated and wild Brassicaceae, including *Brassica*, *Barbarea*, *Sinapis*, *Diplotaxis* and others. The elytral striae are fine, with the 7th to 9th striae broken towards the front and ending well before the humeri. The elytra narrow towards the tip more evenly than in *lepidii*, and are less rounded at the sides. The elytral intervals have very fine rows of punctures. The pronotum is sparsely punctate with somewhat elongated punctures, a clearly puncture-free central longitudinal line is always present. Punctures on the sides of the thorax are large and confluent, merging into coarse longitudinal wrinkles. The dorsum

is shiny, blackish green, blue, bronze or violet, more strongly shining than in the other two species. See **Fig. 3** for illustrations of identification characters. 2.3-4.5mm.

In addition to the three species now recorded in Britain, a further three species are known to occur on the nearby continent close to the French coast. None are particularly common in these areas but all may have the potential to reach Britain.

Aulacobaris chlorizans (Germar)
Known from France and the Netherlands, but seemingly scarce. It also occurs in North Africa, South and Central Europe and is widespread in Central Europe. There is indication of a decline in this species, especially in the north of its range. This is the most robust of the metallic species, with the elytra comparatively short and broad, giving a distinctly stout appearance. The body is shining blue or green-blue, greenish or two-tone and the legs have a slight blue shimmer. The tarsi often reddish brown. The rostrum and pronotum are densely and fairly finely punctured, a smooth pronotal midline is often present. The elytral striae are deep to fine. The species is known to feed primarily on cultivated brassicas such as rapeseed and cabbage, but also on *Diplotaxis tenuifolia*. Occasionally economically harmful to cabbage crops. 3.5-4mm. Most easily recognised by the more squat elytra compared to the other species.

Aulacobaris cuprirostris (Fabricius)
This species has a wide distribution across southern, central and western Europe. This is the second most frequently recorded species in France, after *caerulescens*, and there are a number of records from the French coast. It feeds on a range of Brassicaceae including *Sinapis*, *Brassica* and *Diplotaxis*. This species is distinctive in appearance. The rostrum is metallic, mostly coppery in colour, and the upper side is bright metallic grass green, very shining, rarely blue, violet or coppery. The elytra have extremely fine, extensive rows of punctures on the intervals. The elytral striae are deep and clear. 2.5-3.5mm.

Aulacobaris fallax (Brisout de Barneville)
This species occurs from Western and Southern Europe to southern Central Europe, including northern France. The foodplant is *Isatis tinctoria* (Woad) and the species seems to be rare throughout its range. It is similar in appearance to *caerulescens*, with similarly confluent punctures on the side of the thorax, but *fallax* is more robustly built and has deep striae and a dull surface, like *picirostris* or *lepidii*. The elytral striae are strong, the 7th and 8th striae at the front reduced to a row of punctures that extends to the humeri. The pronotal puncturation consists of stronger, elongated punctures, with a narrow and poorly defined unpunctured central longitudinal stripe. The apparent scarcity and food plant specificity of this species make it an unlikely colonist. 3.5-5mm.

Distribution of *Aulacobaris caerulescens* in Britain

Known records of Aulacobaris *caerulescens* are shown in **Fig. 2**. The current British distribution appears confined to the south-east of England, following the pattern of many recent colonists. Records currently cover nine Tetrads in three vice-counties, North Essex

(VC19, East Kent (VC15) and West Sussex (VC13). Given the distribution of these records, the apparent habitat requirements of the species, and the location of the first record in East Kent, a probable point of colonisation, it seems likely that populations will also be present in West Kent (VC 17), East Sussex (VC 14) and South Essex (VC18). It also seems that, given the breadth of current records, and the lack of any pre-2020 records, even in very heavily recorded areas such as East Kent, that the species colonised Britain fairly recently and is undergoing a quite rapid expansion both north and west, following the pattern of so many recent arrivals from the continent.

Fig. 2. Records of *Aulacobaris caerulescens* in Britain. © OpenStreetMap contributors, CARTO

Ecology

Aulacobaris caerulescens is known to be oligophagous on Brassicaceae on the continent. Recorded foodplants include *Alliaria petiolata* (Garlic Mustard); *Armoracia rusticana* (Horseradish); *Barbarea vulgaris* (Common Wintercress); *Brassica napus* (Rapeseed), *B. nigra* (Black Mustard), *B. oleracea* (Wild Cabbage), *B. rapa* (Field Mustard); *Diplotaxis erucoides* (White Wall-rocket), *D. tenuifolia* (Perennial Wall-rocket); *Lepidium* spp. (peppercresses); *Lobularia maritima* (Sweet Alyssum); *Matthiola fruticulosa* (Dark-flowered Stock) and *Sinapsis arvensis* (Charlock). Most of these species are present in Britain, either as native or naturalised species or as commercial or garden cultivations.

Little information is available on the habitat preferences of *A. caerulescens* on the continent. The majority of recorded food plant species occur in drier, open habitats, particularly in disturbed and ruderal situations. To date, all but two of the British records

are from open, dry habitats with ruderal vegetation such as arable margins, brownfield sites and coastal dunes and shingle. The two other records are from gardens. Tony Witts' record from Canterbury Cathedral gardens was from Hart's-tongue Fern, which is not a potential food plant. It seems certain that this individual was a wanderer from suitable food plants elsewhere in the garden or nearby countryside. As the record was made in October it seems possible that the individual may have been dispersing in search of a hibernation site. The Essex record is from a garden but no further details are known of the habitats present in or around the collection site.

It is interesting that both coastal records, from Sandwich Bay, East Kent, are associated with *Ononis repens*. *Aulacobaris* are considered to feed exclusively on members of the Brassicaceae and Resedaceae and are not known to be associated with any members of the Fabaceae. The most reasonable explanation is that the association is purely coincidental, given the abundance of *Ononis* repens at Sandwich Bay it is hardly impossible that some individuals of *A. caerulescens* wandered onto *Ononis* plants from more suitable food plants. A number of brassicaceous food plants are fairly abundant on the Sandwich Bay Estate, including *Armoracia rusticana*; *Alliaria petiolata*; *Lobularia maritima*; *Diplotaxis tenuifolia*; *Lepidium spp*., *Brassica spp*. and *Sinapsis arvensis*. Both *Cakile maritima* (Sea Rocket) and *Crambe maritima* (Sea-Kale) also occur on the sparsely vegetated dunes and shingle in the area and would appear to be more suitable food plants than *Ononis repens*.

Acknowledgements

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Table 1. Summary of British *Aulacobaris caerulescens* records.

Quantity	Tetrad	Vice County	Date	Recorder	Habitat
1	TR36D	15 (East Kent)	06/05/2020	Christopher Kirby-Lambert	Tall ruderals on brownfield
1	TQ01F	13 (West Sussex)	19/05/2022	Graeme Lyons	Arable margin
1	TR15P	15 (East Kent)	14/10/2022	Antony Witts	Formal garden
1	TQ31F	13 (West Sussex)	30/04/2023	Graeme Lyons	Arable margin
1	TQ30W	13 (West Sussex)	10/05/2023	Graeme Lyons	Arable margin
2	TQ00P	13 (West Sussex)	16/05/2023	Graeme Lyons	Arable margin
1	TR35P	15 (East Kent)	22/07/2023	James McGill	Sparsely vegetated shingle
1	TL72J	19 (North Essex)	30/07/2023	Johnnie Johnson	Garden
2	TR36K	15 (East Kent)	30/07/2023	James McGill	Sand dune

Table 2. Identification features of British *Aulacobaris* species.

Aulacobaris lepidii

Striae **deep**, wide, clear ①.
Striae 7-9 almost reach shoulder bump ② (although may be broken into dots and dashes at that point, they are still wide and deep). **Area behind shoulder bump clearly grooved** from striae.
Surface metallic but **rather dull** ③.
Punctures on side of thorax confluent, surface appears **wrinkled** ④.

Aulacobaris caerulescens

Striae **shallow, fine** ⑤. Outer striae often broken into dots ⑥.
Striae 7-9 fade out well behind shoulder bump ⑦, **area behind shoulder bump appears smooth** ⑧ (visible from side and from above).
Surface more **smooth and shining** ⑨.
Punctures on side of thorax confluent, surface appears **wrinkled** ④.

If the surface is shining like *caerulescens* but the elytra are more squat and the thorax punctures are like *picicornis*, compare *Aulacobaris chlorizans*, another species that might be overlooked in Britain.

Aulacobaris picicornis

Striae **deep**, wide, clear ①.
Striae 7-9 almost reach shoulder bump ② (although may be broken into dots and dashes at that point, they are still wide and deep). **Area behind shoulder bump clearly grooved** from striae.
Surface metallic but **rather dull** ③.
Punctures on side of thorax mostly **separated**, **round** ⑩, surface does not appear wrinkled.

Note variation in width: some are narrower across pronotum and wing-cases than others (perhaps as much variation within *picicornis* as between *picicornis* and the other two species).

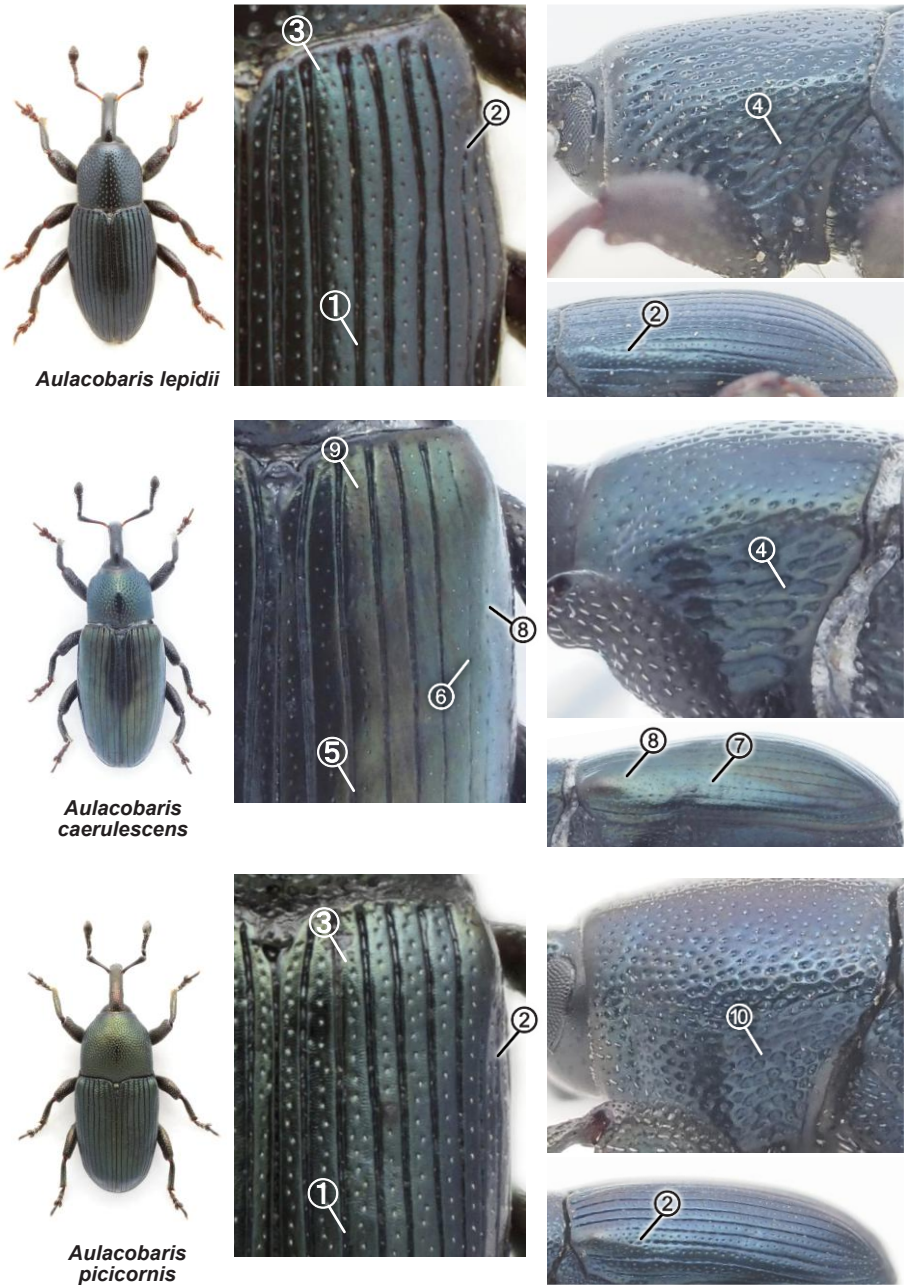

Fig. 3. Characters of *Aulacobaris* species.