



## *Globicornis peckhamae* (Coleoptera, Dermestidae, Megatominae), a new species from Mallorca, and a description of *Globicornis bifasciata*

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The family Dermestidae Latreille, 1804 consists of over 1800 species (Háva 2023). The genus *Globicornis* Latreille in Cuvier, 1829 sits within the subfamily Megatominae Leach 1815. According to Háva (2023), *Globicornis* is split into a further four subgenera: *Elania* Mulsant & Rey, 1868 (2 species), *Globicornis* Latreille in Cuvier, 1829 (19 species plus 2 fossil species), *Hadrotoma* Erichson, 1846 (6 species plus 2 fossil species), and *Pseudomesalia* Ganglbauer in Bodemeyer, 1900 (5 species), although Zhou *et al.* (2022) argue that more research is required to establish synonymies with this group. *Globicornis bifasciata* (Perris, 1866) is known from France and Mallorca, but more recently specimens have been found from further afield across western Europe and north Africa (Háva 2023).

*Globicornis bifasciata* males have a distinctive antennal structure that differs considerably from all other members of the genus (see Herrmann 2023) no doubt creating little incentive to study the species further. However, other studies, notably on *Anthrenus* Geoffroy, 1762, have illustrated the importance of describing and illustrating even common species carefully to facilitate and inform taxonomic studies on closely related species (Holloway and Bakaloudis 2020; Holloway *et al.* 2020). *Globicornis bifasciata* has not been subjected to the same level of scrutiny so following on from the *Anthrenus* example, a decision was made to analyse *G. bifasciata*. During this study, two species were found.

Insects were collected in June 2021 from Mallorca and maintained in 70% ethanol. 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 needles. The soft tergites were then peeled away from the harder ventrites to expose the genitalia. The aedeagus was lifted out and detached from the ring sclerite. Sternite IX was then detached from the aedeagus using the needles.

Images of habitus were captured at ×20 magnification using a Canon EOS 2000D camera mounted on the BMSL microscope. The antennae were teased out and images were captured at ×100 magnification using a Canon EOS 1300D camera mounted on a Brunel monocular SP28 microscope. Using the same set up, dorsal, ventral, and lateral aspect of the aedeagi were captured at ×200 magnification. All images were fed through Helicon Focus Pro version 8.1.0 focus-stacking software. Morphometric measurements were made using DsCap.Ink Software version 3.90. Measurements taken: body length (BL): distance from anterior margin of pronotum to the apex of the elytra, body width (BW): distance across midpoint of elytra, elytron length (EL): distance from posterior tip of scutellum to tip of elytron, pronotum width (PW): distance between the posterior corners, pronotum length (PL): distance between the anterior and posterior margins. After dissection, all body parts were mounted on card. Natural History Museum, London (NHML).

### *Globicornis bifasciata* (Perris, 1866)

(Figure 3A–D)

Externally, the two species were very similar, and the original description (Perris 1866) is insufficient to indicate which of the species was being referred to. The holotype of *G. bifasciata* was obtained from INRAE, Centre de Biologie pour la Gestion des Populations, Montpellier, France for dissection. The holotype is small, BL = 2.075 mm, and slim BW/BL = 0.593. The aedeagus is broad and angular, parallel-sided, with a slim median lobe. This information definitively indicates which of the species Perris (1866) was in possession of when he named it *G. bifasciata*.

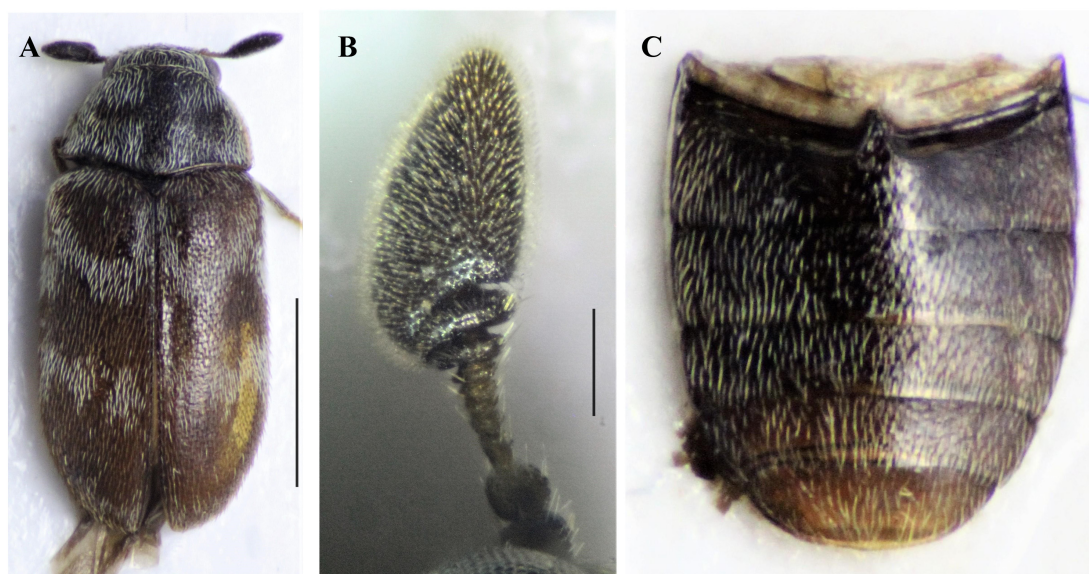
***Globicornis peckhamae* sp. nov.**

(Figures 1–2)

**Specimen examined.** Holotype: *Globicornis peckhamae* sp. nov. Mallorca, Bunyola (39.696N, 2.700E) 4 June 2021 I. Cañada Luna leg. Holotype male NHML. Paratypes 7 males collected same time and place as holotype.

**External characteristics.** Holotype description: slim, BL = 2.45 m, BW/BL = 0.66. Head with one median ocellus on vertex. Pronotum black and approximately twice as wide as long (PL/PW = 0.57). Elytra brown, noticeably paler than pronotum (Figure 1A). Prominent humeri, elytral margins constricting slightly post-humeri continuing almost parallel to each other before sweeping inwards to elytral tips. Pronotum almost as wide as humeri. Posterior margin of pronotum bisinuate. Mid-point of pronotum on posterior margin is a rounded tip above a black, triangular scutellum. From a posterior corner of the pronotum, the lateral margin forms a smooth curve up towards the back of the head and then down to meet the other posterior corner. Body covered in punctures. Some whitish hairs across the base of both elytra. Pale hairs on pronotum interrupted by black, hairless stripe down and across pronotum forming a black cross. Pale hairs across vertex of head. Two fasciae cross elytra consisting of whitish hairs. The sub-basal fascia begins at each humerus, sweeps down across each elytron reaching the suture, and then up towards the scutellum. The pale hairs of the sub-apical fascia start at the lateral margin of each elytron, gently angling down to meet at the elytral suture.

The 10-segmented antenna (Figure 1B) carries a large, asymmetrical club (example shown = 323 µm long) consisting largely of antennomere 10. Antennomeres 1 and 2 dark brown and spherical. Antennomeres 3 – 7 a dark yellowish colour, and antennomeres 8–10 dark brown to black. Antennomeres 8 and 9 disk-shaped with antennomere 8 larger than antennomere 7, and antennomere 9 larger than antennomere 8. Antennomere 10 is large and triangular, with a straight ventral margin and a curved dorsal margin. Antennomeres 8 and 9 sit within a large excavation at the base of antennomere 10. Antennomere 10 is covered in short, stiff, regularly distributed setae. Tibiae and femora dark reddish brown, tarsi pale reddish brown. The ventrites are dark brown to black and covered in pale hairs (Figure 1C).



**FIGURE 1.** *Globicornis peckhamae* sp. nov. holotype, A: habitus (scale bar = 1mm), B: antenna (scale bar = 100µm), C: ventrites (scale bar = 1mm).

**Internal characteristics.** The aedeagus (Figure 2A) is small (example shown = 235 µm). The parameres diverge evenly from the base such that the overall appearance of the aedeagus is not very angular. The parameres are pale brown indicating limited sclerotization, except for the apical 25% of the parameres which curve in towards the median lobe ending in rounded tips and are soft and entirely transparent. The parameres are deeper dorso-ventrally than they are wide. The inner surfaces of the parameres carry spikey, backward pointing setae (Figure 2B). Setae also cover all unsclerotized surfaces of the parameres.

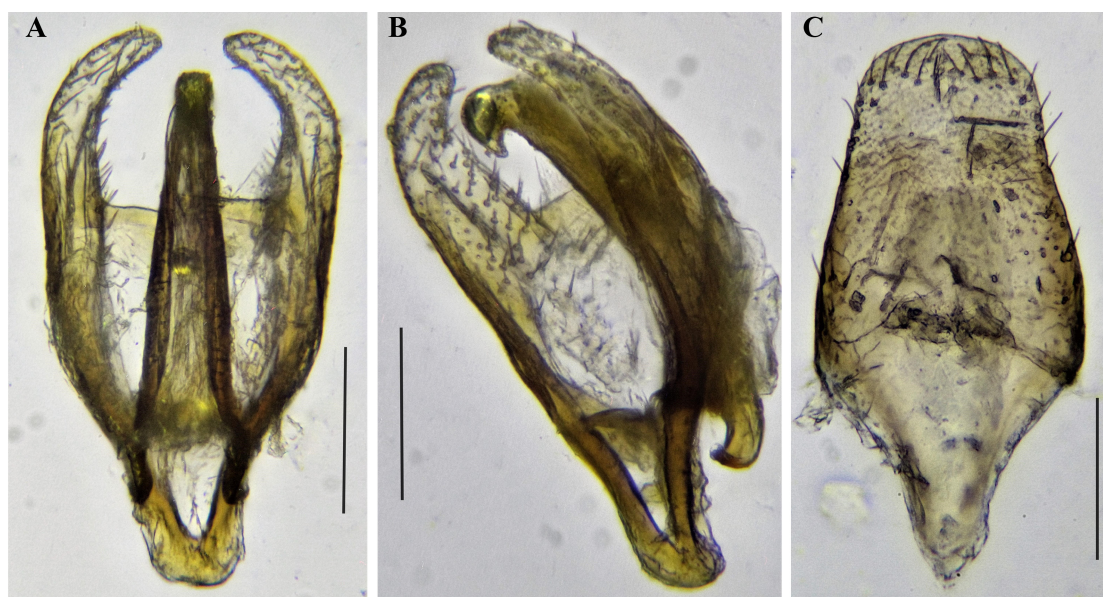
The median lobe (Figure 2A) is broad, consisting of a brown ridge along both sides of the median lobe with paler tissue between the ridges. The ridges are straight and converge only slightly towards the tip of the median lobe. Median lobe is heavily curved dorsally, terminating in a hooked cap (Figure 2b). The tip of the median lobe protrudes beyond the dorsal surface of the parameres.



Sternite IX (Figure 2C, example shown 320 µm long) has a single, broad anterior stem. From the tip of the anterior stem, the lateral margins sweep smoothly outwards to blunt corners before continuing, converging slightly to a broad, rounded posterior tip. The posterior end is adorned with stout black setae that lean inwards towards the midline, but few of these setae protrude beyond the posterior margin. The outer margins of sternite IX carry very few small setae. Beyond the posterior tip, virtually no setae on the dorsal and ventral surfaces.

*Confusion species.* The only confusion species to consider is *G. bifasciata* (Figure 3A). Externally, *G. bifasciata* and *G. peckhamae* are very similar except that in *G. bifasciata* there is barely any difference in colour between the pronotum and the elytra, both being very dark. Internally, *G. bifasciata* and *G. peckhamae* do vary. *Globicornis bifasciata* aedeagus (Figure 3B) is more angular because the parameres diverge strongly from the base before bending sharply towards posterior. The parameres continue almost parallel to each other before folding inwards towards the median lobe. In many *G. bifasciata*, the paramere tips when dry fold inwards and ventrally (Figure 3C). Overall, the aedeagus of *G. bifasciata* is more sclerotized and robust than *G. peckhamae*. This difference is most prominent at the paramere tips of *G. bifasciata* which are brown rather than translucent. As in *G. peckhamae*, the median lobe of *G. bifasciata* consists of heavily sclerotized outer ridges sandwiching paler tissue, but these ridges converge more strongly in *G. bifasciata* coming together to form a very narrow tip that is deeper dorsoventrally than it is laterally. The median lobe is more heavily curved than in *G. peckhamae* which protrudes further beyond the dorsal margins of the parameres (Figure 3c). The median lobe terminates in a hooked cap that is narrower than in *G. peckhamae*. The anterior stem of sternite IX (Figure 3D) is narrower than *G. peckhamae*. The margins sweeps outwards from the anterior stem to sharp angles before turning towards a broad, rounded posterior margin. The posterior margin is adorned with stout, inward pointing setae which extend beyond the posterior margin, unlike *G. peckhamae*. There are only a few small setae down the lateral margins of sternite IX and nothing beyond about 1/3 from the posterior tip.

*Morphometrics.* A sample of 16 males were dissected, including *G. bifasciata* holotype: 8 *G. bifasciata* and 8 *G. peckhamae*. The dimensions of the pronota of the two species were almost identical such that mean PL/PW was  $0.57 \pm 0.12$  in both cases. Mean EL of *G. bifasciata* was  $1.66 \pm 0.15$  (standard deviation) mm and mean EL of *G. peckhamae* was  $1.70 \pm 0.12$  mm, but *G. peckhamae* was broader than *G. bifasciata* with BW/EL =  $0.645 \pm 0.005$  and  $0.593 \pm 0.007$ , respectively. BW/EL differed significantly between the two species ( $t_{14} = 6.72$ ,  $p < 0.001$ ).

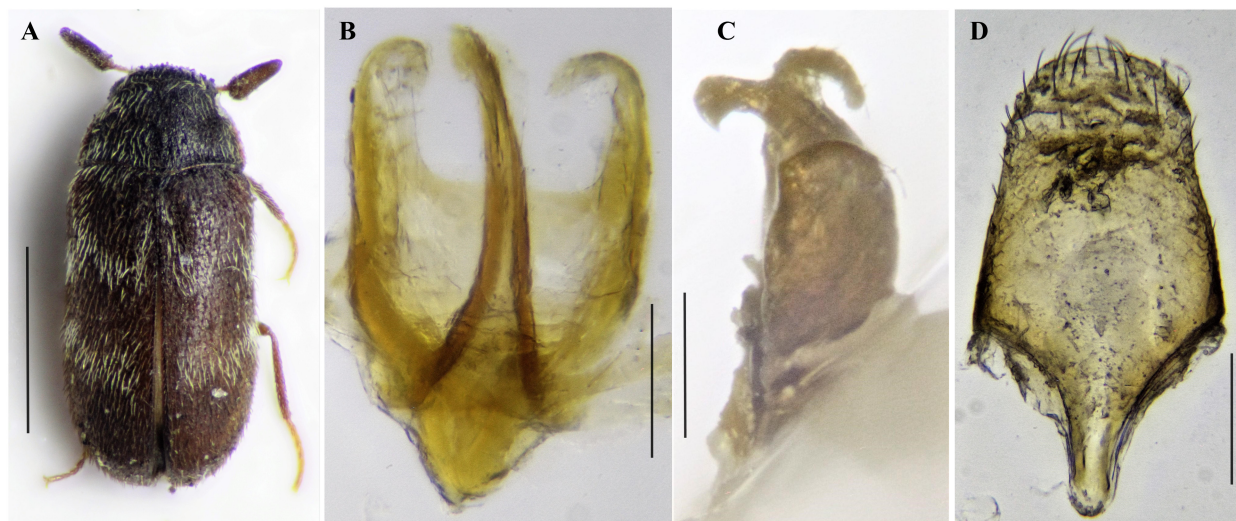


**FIGURE 2.** *Globicornis peckhamae* sp. nov. holotype, A: aedeagus ventral aspect, B: aedeagus dorso-lateral aspect, C: sternite IX. Scale bars = 100µm in all cases.

**Discussion.** Eight *G. peckhamae* from a sample of 16 indicates that *G. peckhamae* is not scarce. Háva (2023) suggests that *G. bifasciata* can be found in France, Mallorca, Monaco, Sardinia, Sicilia, Spain, Algeria, and Tunisia. The present study casts doubt on the accuracy of this distribution due to the similarity of the external characteristics of the two species. All that is now known for certain is that both species can be found on Mallorca and *G. bifasciata* can be found in France, presumably southern France (Perris 1866). More work needs to be done to establish the true distributions of the two species, both the habitat related distribution in Mallorca and more widely across western Mediterranean. If these data can

only be gathered via dissection, progress will be slow. However, a statistically significant difference in the body width of the two species was indicated here. Of course, a statistically significant result might not equate with a usable result if there is a great deal of overlap between the two species. From the relatively small samples examined here, an overlap around  $BW/EL = 0.625$  was indicated. A study involving larger sample sizes needs to be carried out to establish exactly where the overlap lies, and which  $BW/EL$  values definitively indicate one species or the other. In addition, a clear colour difference between the pronotum and the elytra was noted for *G. peckhamae* which is not present, or at least not obvious, in *G. bifasciata*. If the presence or absence of this colour difference is consistent, in conjunction with the morphometric differences it might be possible to differentiate between *G. bifasciata* and *G. peckhamae* with confidence without the need to resort to dissection.

**Etymology.** The species is named after Katie Peckham who discovered the species whilst working towards an MSc by Research in Entomology.



**FIGURE 3.** *Globicornis bifasciata*, A: habitus holotype (scale bar = 1mm), B: aedeagus holotype ventral aspect (scale bar = 100 $\mu$ m), C: aedeagus lateral aspect (scale bar = 100 $\mu$ m), D: sternite IX (scale bar = 100 $\mu$ m).

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