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(Coleoptera: Dermestidae: Megatominae),
a new species from Pakistan

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Anthrenus (Nathrenus) peacockae (Coleoptera: Dermestidae: Megatominae), a new species from Pakistan

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Abstract. A new species, *Anthrenus (Nathrenus) peacockae* Holloway (Coleoptera: Dermestidae: Megatominae) from Pakistan is described and compared with *A. narani* Háva and Ahmed, 2014, the most similar species. Images of the habitus, ventrites, antenna, aedeagus, sternites VIII and IX are presented. *Anthrenus peacockae* is only the third species in the subgenus *Nathrenus* Casey, 1900 to be recorded from Pakistan.

Key words. Carpet beetle, *Anthrenus narani*, aedeagus, median lobe, sternite, taxonomy, distribution, taxonomy.

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Introduction

Dermestidae Latreille, 1804 (Coleoptera) contains over 1900 species (Háva 2023). One of the largest genera within the family is *Anthrenus* Geoffroy, 1762 with nearly 300 species, split into 10 subgenera (Háva 2023). Research on larval features suggests that *Anthrenus* is polytypic (Kadej 2018), so it is possible the taxonomy of *Anthrenus* might be revised. For the moment, taxonomy of *Anthrenus* is based largely on antennal structure (Peacock 1993).

Despite being a large genus, *Anthrenus* continues to become more speciose as workers turn their attention to dissection and genital structure to differentiate species. This approach was largely pioneered by Beal (1998) but first applied to Palaearctic *Anthrenus* in a focused manner by Kadej et al. (2007). Kadej et al. (2007) described three new species, with additional new *Anthrenus* species discovered through dissection by Kadej and Háva (2011), Holloway (2019, 2020, 2021, 2023), and Holloway et al. (2023b) mostly by reviewing material in museum collections.

The Natural History Museum, London (NHML) contains a good collection of Dermestidae. Whilst examining the collection of *Anthrenus* species at NHML, the author came across nine specimens of an unfamiliar species. One of the specimens had been labelled by Enid Peacock as '*Anthrenus (Nathrenus)* sp. n.?. Here *Anthrenus (Nathrenus) peacockae*, a new species from Pakistan, is described.

Materials and Methods

The dry, carded specimens were borrowed from NHML for study. All specimens were macerated in a solution of 2% acetic acid for five days to soften and allow removal from staging prior to dissection. 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 then peeled away from the harder ventrites to expose the genitalia. Sternite VIII was detached from tergite IX, and the aedeagus and sternite IX were detached from the ring sclerite. Habitus images, both dorsal and ventral sides, were captured at $\times 20$ magnification using a Canon EOS 2000D camera mounted on the BMSL microscope. Images of the antenna, aedeagus, and sternite IX were captured at $\times 100$ magnification using a Canon EOS 1300D camera mounted on a Brunel monocular SP28 microscope. Images of sternite VIII were captured via the Canon EOS 1300D at $\times 50$. After dissection, all body parts were mounted on card. All images were fed through Helicon Focus Pro version 8.2.2 focus-stacking software. All 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): maximum distance across the elytra.
- Antennal club length (AL): length of the last three antennomeres.
- Antennal club width (AW): maximum width across the terminal antennomere.
- Paramere length (PL): distance from the anterior end of the parameres to the apex of the parameres.
- Sternite IX length (SL): distance from the tip of one anterior horn to the tip of the posterior lobe.

The data for the distribution map (Shorthouse 2010) were derived from the data labels.

Results

Anthrenus (Nathrenus) peacockae Holloway, new species

(Fig. 1, 2)

Type specimens. Holotype male. Hazara, Lower Kagan Valley, Pakistan (32.795°N, 74.285°E), 6 vi 1927, H.G. Champion leg. NHML.

Paratypes. Eight males, NHML, same data as holotype.

Description, external characteristics. Holotype *Anthrenus (Nathrenus) peacockae* (Fig. 1A) (BL = 4.1 mm, BW = 2.65 mm) has a single orange ocellus on head between the eyes but below the level of the top of the eyes. The inner margins of the eyes smoothly curved with no notch, typical of the subgenus *Nathrenus* Casey, 1900 (Peacock 1993). The head and prothorax are a very dark brown; the elytra are a pale chestnut brown. The pronotum and elytra are covered in loosely packed pale cream and very dark brown scales. The scales are slim and sharply pointed at both ends. The pale scales are clustered in the basal ¼ of each elytron and the posterior lateral corners of the pronotum. Elsewhere, the pale scales are scattered along the elytral suture and form a loose fascia beyond the midpoint with patches at the lateral elytral margins just beyond the midpoint and sub-apically. The ocellus is

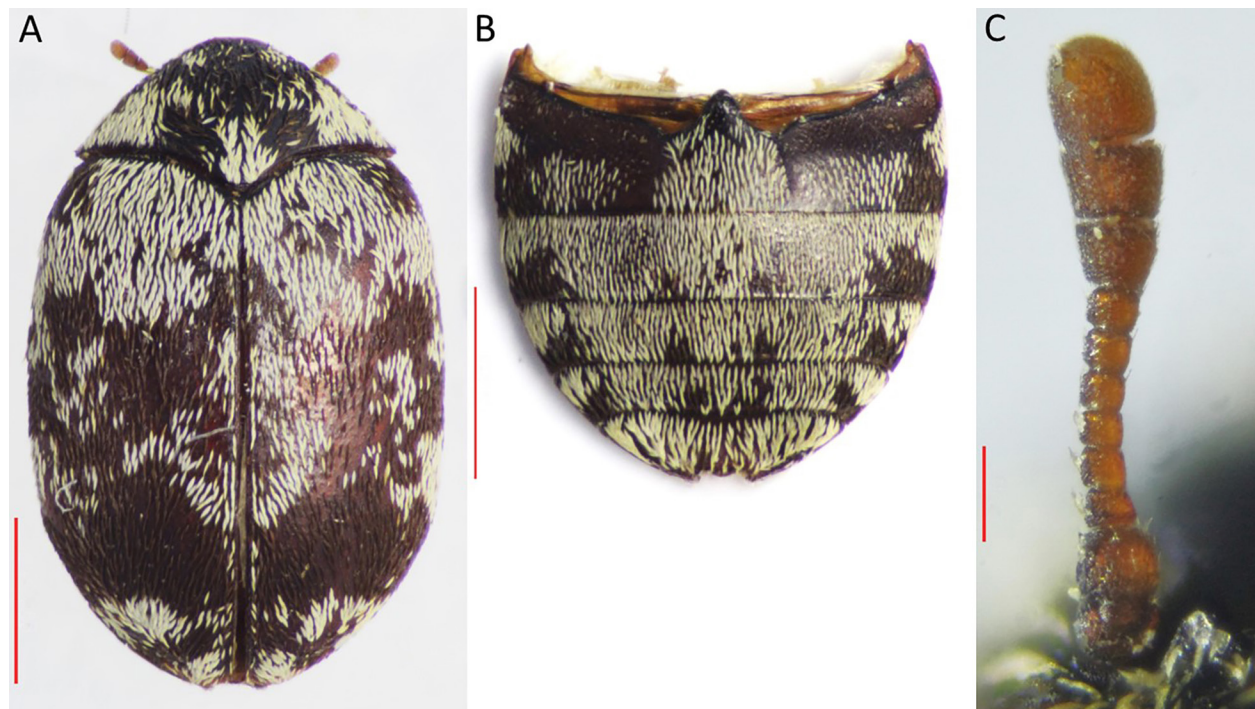


Figure 1. *Anthrenus peacockae* holotype. **A)** Habitus dorsal aspect (scale bar = 1 mm). **B)** Abdominal ventrites (scale bar = 1 mm). **C)** Antenna (scale bar = 100 μ m).

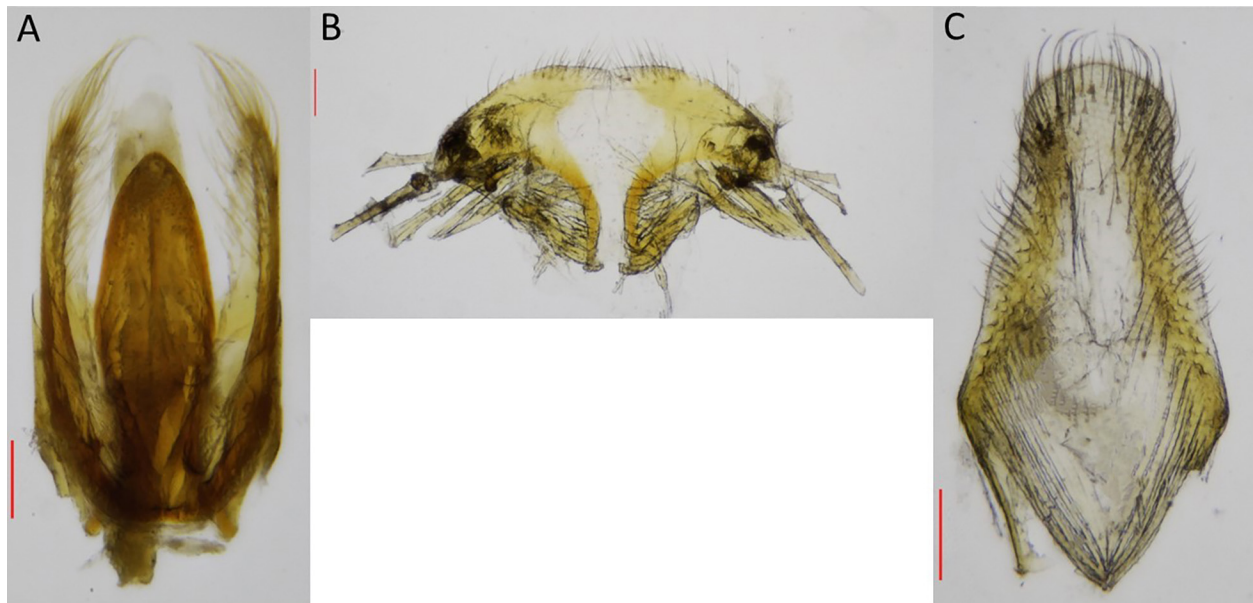


Figure 2. *Anthrenus peacockae* holotype. **A)** Aedeagus dorsal aspect. **B)** Sternite VIII dorsal aspect. **C)** Sternite IX dorsal aspect. All scale bars = 100 μm .

surrounded by dark brown scales and pale cream scales line the inner margins of each eye. Palps orange (evident in some paratypes).

The ventrites (Fig. 1B) are mid-brown and covered in pale cream scales. The lateral margins of each ventrite carry large spots of dark brown scales, largest on ventrite I and becoming progressively smaller towards ventrite IV. There are two spots of brown scales either side of the midline on ventrites II, III, and IV. The dark spot of scales on ventrite I is not entirely bounded by pale scales along the anterior edge. The tergites are a pale yellowish brown.

The 11-segmented antenna (Fig. 1C) (AL = 263 μm , AW = 107 μm) is slim and entirely pale reddish brown. Antennomeres 1 and 2 are large and round, antennomeres 3–8 are smaller and squarish, and antennomeres 9–11 form a well-defined elongated club. All components of the legs are similarly pale reddish brown, contrasting with the dark brown of the thorax. The anterior faces of the femora are covered in pale scales, the tibiae and tarsi lack scales.

Description, internal characteristics. Figure 2A shows the ventral surface of the holotype male aedeagus. The parameres (PL = 530 μm) are narrow, but deeper dorsoventrally. The lateral margins are mostly parallel to each other with only the slightest inwards curve at the apex. The inner margins of the parameres are slightly concave and covered in long, fine hairs. The apices of the parameres are adorned with long, fine, straight hairs.

The median lobe is very broad, parallel sided from the base to the midway point, apically the lateral margins converge to a rounded, blunt apex that falls short of the tips of the parameres. Along the ventral surface of the median lobe and projecting beyond the apex is a membranous tube.

Sternite VIII (Fig. 2B) is an ornate structure with several broad spines or spicules emerging from each curved sclerotized rib and pointing obliquely anterior. Most spicules with apex obliquely flattened. The anterior halves of both sides of sternite VIII consist of a lattice of sclerotized rods.

Sternite IX (Fig. 2C, SL = 585 μm) is a very thin membranous structure that expands from the base to about the basal $\frac{1}{3}$ and from there the lateral margins converge to the apical $\frac{1}{5}$, where margins become parallel to a rounded apex. The margins from the apex to about midway are covered in many long hairs, which are longest and densest around the apex; hairs hook inwards apically. There are a few hairs on the central part of sternite IX, but the hairs are concentrated on the outer sections of the sternite.

Morphometrics. Mean BL = 3.94 ± 0.22 (standard deviation) mm, mean BW/BL = 0.65 ± 0.01 , $n = 9$ in both cases. The data indicate that 95% BL of *A. peacockae* would lie within 3.43–4.46 mm. The smallest individual found in the sample studied was 3.45 mm, the largest 4.2 mm.

Distribution. The location of collection of the holotype and all paratypes is shown in Fig 3.

Etymology. *Anthrenus peacockae* is named after Enid Peacock, author of the Royal Entomological Society Handbook on Dermestidae and Derodontidae in the UK, who noted the *A. peacockae* specimens studied here were a new species.

Differential diagnosis. Initially, *A. peacockae* was thought to be *A. narani* Háva and Ahmed, 2014, but the internal features illustrated by Háva and Ahmed (2014) (Fig. 4) bear little resemblance to *A. peacockae*. Externally, *A. peacockae* and *A. narani* are similar.

The antenna illustrated for *Anthrenus narani* by Háva and Ahmed (2014) (Fig. 4A) has a truncated apex to the terminal antennomere (*A. peacockae* is rounded, Fig. 1C), only antennomere 1 is large and rounded in *A. narani* (both antennomeres 1 and 2 are large and rounded in *A. peacockae*), antennomeres 2–5 are similar sized and quadrate, antennomeres 6–8 are much broader than long (antennomeres 3–8 are all quadrate in *A. peacockae*).

According to Háva and Ahmed (2014), the aedeagus of *A. narani* (Fig. 4B) has strongly curved parameres with much smaller tufts of hairs at the apex than *A. peacockae* (Fig. 2A). The illustration in Háva and Ahmed (2014) suggests that only the apex of each paramere has hairs. The paramere apices almost touch and are distinctly longer than the median lobe. Otherwise, the median lobe of *A. narani* illustrated by Háva and Ahmed (2014) is similar to *A. peacockae* (Fig. 2A).

Sternite IX illustrated by Háva and Ahmed (2014) (Fig. 4C) has a truncated posterior apex (*A. peacockae* is rounded, Fig. 2C) with only short hairs (*A. peacockae* sternite IX has many long hairs apically and along the sides). Háva and Ahmed (2014) illustrate a sternite IX with posterior margins converging all the way to the posterior apex (sternite IX margins for the final 1/5 are parallel sided in *A. peacockae*). Háva and Ahmed (2014) did not illustrate sternite VIII.

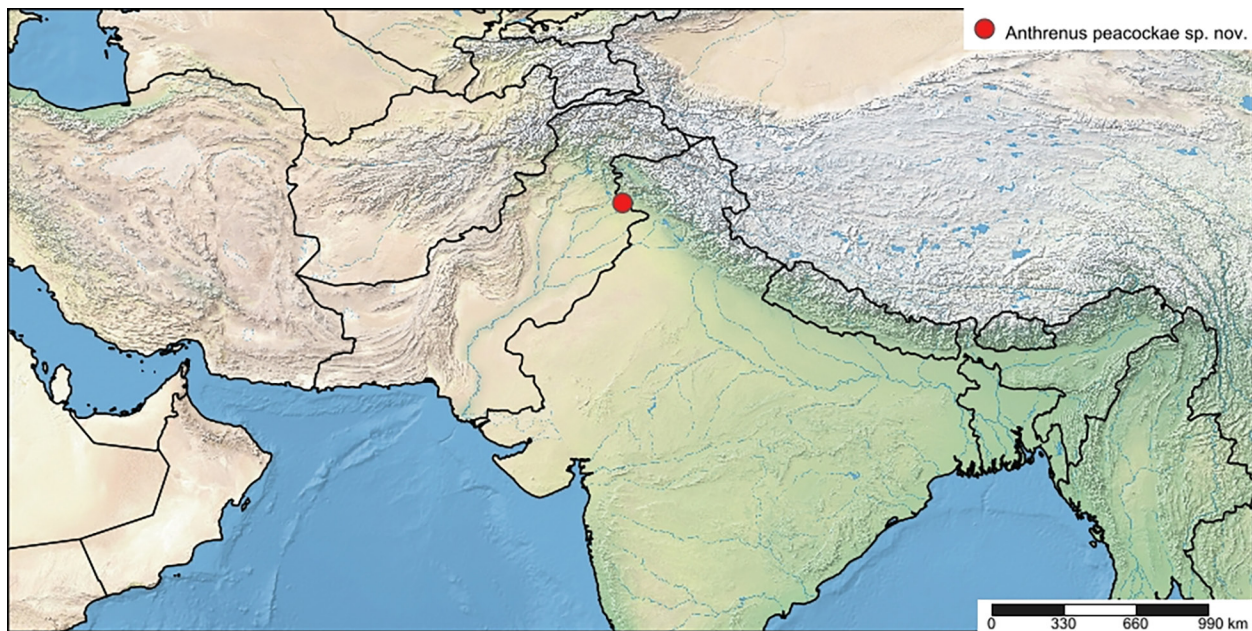


Figure 3. Collection location of holotype and all paratype *Anthrenus peacockae* from Pakistan.

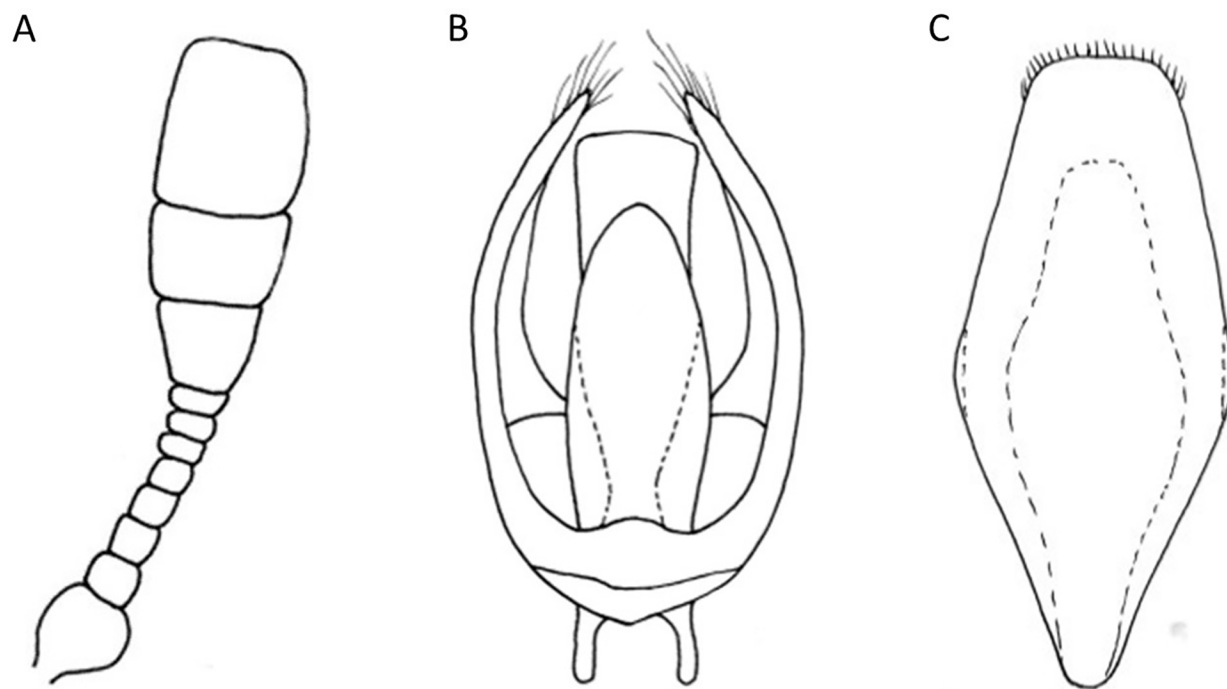


Figure 4. *Anthrenus narani* as illustrated by Háva and Ahmed (2014). **A)** Antenna. **B)** Aedeagus. **C)** Sternite IX.

Discussion

Anthrenus peacockae represents only the third *Nathrenus* species known from Pakistan, the others being *A. narani* and *A. verbasci* Linnaeus, 1767. Háva and Ahmed (2014) report that *A. narani* is large with the holotype BL = 4.3 mm. *Anthrenus peacockae* is also large with average BL = 3.94 mm. One of the few other *Nathrenus* species with some specimens approaching 4 mm is *A. transcaspicus* Mroczkowski, 1960 (Herrmann 2023), which is known from Iran and Turkmenistan, the same region of Asia as Pakistan.

Anthrenus narani and *A. peacockae* are externally similar, both in terms of size and scale pattern. The present study illustrates the necessity to dissect genitalia to establish species identity for sound taxonomic work and to determine distribution (Holloway et al. 2023a). From the information provided by Háva and Ahmed (2014) and the information presented here, it is clear that *A. peacockae* and *A. narani* are different species.

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