

Descriptions of Anthrenus (Anthrenodes) pica and Anthrenus (Anthrenodes) translucens (Coleoptera: Dermestidae: Megatominae), two new species from Yemen and Oman

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Descriptions of *Anthrenus* (*Anthrenodes*) *pica* and
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(Coleoptera: Dermestidae: Megatominae),
two new species from Yemen and Oman

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Descriptions of *Anthrenus* (*Anthrenodes*) *pica* and *Anthrenus* (*Anthrenodes*) *translucens* (Coleoptera: Dermestidae: Megatominae), two new species from Yemen and Oman

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Abstract. Two new species, *Anthrenus* (*Anthrenodes*) *pica* Holloway and Herrmann and *Anthrenus translucens* Holloway and Herrmann (Coleoptera: Dermestidae: Megatominae) from Oman and Yemen are described and compared with *A. malkini* Mroczkowski, 1980, the most likely confounding species because of geographical overlap and internal similarity. Images of the habitus, ventrites, antenna, aedeagus, and sternite IX are presented. Nine species of the subgenus *Anthrenodes* Chobaut are now known from the southern Arabian Peninsula.

Key words. Taxonomy, identification, dissection, *malkini*.

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Introduction

The genus *Anthrenus* Geoffroy, 1762 (Coleoptera: Dermestidae), is large, numbering about 300 species. *Anthrenus* is split into 10 subgenera (Peacock 1993; Háva 2024a), including the subgenus *Anthrenodes* Chobaut, 1898. *Anthrenodes* is distinguished from other subgenera within *Anthrenus* by having an antenna with 10 antennomeres (Mroczkowski 1980; Peacock 1993). There are about 35 *Anthrenodes* species known, which are widely distributed, mostly across the southern Palearctic, north Africa, Arabian Peninsula, north into Turkey, and east into Asia. The main exception to this distribution is *A. (Anthrenodes) sarnicus* Mroczkowski, 1962, which is found in NW Europe, principally the UK and Channel Islands (Holloway and Pinniger 2024). In the current study, two new species *Anthrenus (Anthrenodes) pica* and *Anthrenus (Anthrenodes) translucens* are described from Yemen and Oman and compared with *A. (Anthrenodes) malkini* Mroczkowski, 1980.

Materials and Methods

Four specimens were borrowed from The Natural History Museum, London (BNHM) along with a further 32 specimens from Andreas Herrmann's private collection (AHEC). All 36 specimens were labelled *Anthrenus malkini*.

All specimens were macerated in a solution of 2% acetic acid for five days to 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. The aedeagus was detached from the ring sclerite, and then sternite IX was detached from the ring sclerite and the aedeagus. Habitus images, both upper and lower

sides, were captured at $\times 20$ magnification using a Canon EOS 2000D camera mounted on the BMSL microscope. Images of aedeagi and sternite IX were captured at $\times 200$ magnification for measurement using a Canon EOS 1300D camera mounted on a Brunel monocular SP28 microscope. After dissection, all body parts were mounted on card. The antennae were teased out and images were taken at $\times 200$ magnification through the SP28 microscope. All images were fed through Helicon Focus Pro version 8.2.2 focus-stacking software. Habitus measurements were made using a calibrated eyepiece. All other 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.
- Paramere length (PL): distance from the anterior end of the parameres to the apex of the parameres
- Median lobe length (ML): distance from posterior tip to tip of one anterior stirrup.
- Sternite IX length (SL): distance from the tip of one anterior horn to the tip of the posterior lobe

Distribution maps were created using Shorthouse (2010) with data derived from the data labels on the studied specimens and Háva (2024a). Scale bars were added using ImageJ 1.53M (Schneider et al. 2012).

Taxonomy

Dermestidae Latreille, 1803

Megatominae Dalla Torre, 1911

Anthrenini Gistel, 1848

Anthrenina Gistel, 1848

Anthrenus Geoffroy, 1762

***Anthrenus (Anthrenodes) pica* Holloway and Herrmann, new species**

Figures 1–3

Type specimens. Holotype male. Yemen, Al'Asr, 3 miles west of San'a (Sana'a: 15.367, 44.198), circa 8000ft, on flowers of spurge, 25.viii.1946, A.R. Waterston leg., BNHM

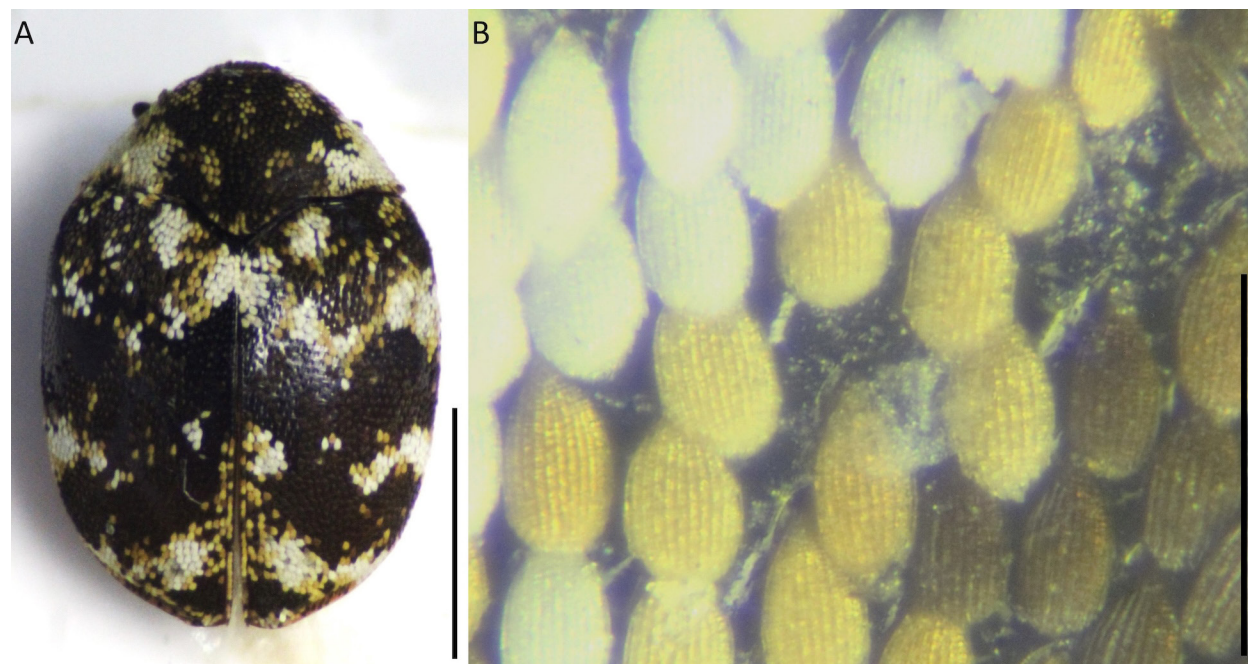


Figure 1. *Anthrenus pica* n. sp., holotype. **A)** Habitus (scale bar = 1 mm). **B)** Elytral scales (scale bar = 100 μ m).

Paratypes. One male, two females, same data as for holotype, BNHM. One female, Oman, Dhofar Pr, cca 6km NW of Dhalaut, route 47, 610 m, 16.748, 53.214, J. Vetrovec leg., AHEC.

Description, external characteristics. Holotype *Anthrenus* (*Anthrenodes*) *pica* (Fig. 1A), BL = 2.20 mm, BW = 1.55 mm). Single dark, amber-colored ocellus at level of top of eyes, lower inner margin of eyes notched. Integument of head and pronotum black. Vertex covered in dark brown scales, paler brown at upper eye margin, face covered in cream-colored scales tinted brown, grading into brown above labrum. Clear gap between scales of about half width of scales. Lateral pronotal margins covered in white scales, becoming progressively darker brown away from lateral margins, disk of pronotum covered in dark brown scales with small number of isolated slightly paler brown scales. Small patch of slightly paler brown scales at centre of posterior margin adjacent to scutellar shield. Scales oval (Fig. 1B).

Elytral integument shining black. Three loose bands of white and pale brown scales, sub-basal, sub-medial, pre-apical (Fig. 1A). Sub-basal band starts at anterior corner of lateral margin, extending down margin, turning



Figure 2. *Anthrenus pica* n. sp. **A)** Paratype female habitus, ventral surface (scale bar = 1 mm). **B)** Paratype male antenna (scale bar = 100 μ m).

in towards elytral disc before sweeping up to small, black scutellar shield. Sub-medial band consists of three disconnected spots of pale scales. Pre-apical band consists of large sub-sutural, pre-apical spot, a lateral marginal spot, and scatterings of pale scales at the elytral apex. Other than pale bands, elytra covered in dark brown scales.

Ventrites (Fig. 2A) covered in overlapping, cream-colored scales. Scale color grades into yellow towards lateral margins of each ventrite. Tiny spots of brown scales at anterior end of lateral margins of ventrites 3–5.

Antenna with 10 antennomeres (Fig. 2B), antennomeres 1–7 clear, dark red. Antennal club with three antennomeres, teardrop shaped, covered in short hairs and appearing darker than other antennomeres. All components of legs dark red, anterior faces of tibiae covered in white scales.



Figure 3. *Anthrenus pica* n. sp., holotype. A) Aedeagus dorsal aspect. B) Sternite IX. Scale bars = 100 μ m in both cases.

Description, internal characteristics. Aedeagus (Fig. 3A) with two rod-like parameres (PL = 349 μ m) joined at anterior margin. From anterior margin, parameres sweep outwards and then posteriorly as dark brown rods. Outer margins of parameres slightly concave. Posterior tips of parameres flat, paler brown and pinched inwards towards tip of median lobe. Disc of pale brown tip of paramere with small white window. Inner margin of paramere tips carrying small setae adjacent to and above tip of median lobe. Median lobe (ML = 419 μ m) broad at base, parallel sided to halfway. From halfway, margins converge evenly to rounded tip that falls short of tips of parameres. Anterior end of median lobe carrying two long, straight stirrups. Sternite IX (Fig. 3B) (SL = 410 μ m) with short posterior lobe occupying no more than 1/3 total length of sternite. Posterior margin of posterior lobe flat and with white tissue extending down margins and into disc of lobe. Setae emerge mostly from marginal and sub-marginal white tissue of posterior lobe, some strong setae emerging from disc of posterior lobe. Anterior to white tissue on posterior lobe, sternite IX pale brown. Most of length of sternite IX consists of two long, evenly curved horns pointing anterior.

Etymology. The specific epithet is a noun alluding to the Eurasian magpie, *Pica pica* (Linnaeus). The black-and-white appearance of this new species is evocative of the piebald coloration of the magpie.

***Anthrenus* (*Anthrenodes*) *translucens* Holloway and Herrmann, new species**

Figures 4–6

Type specimens. Holotype male. Oman, Dhofar Pr, cca 6km NW of Dhalaut, route 47, 610m, 16.748, 53.214, J. Vetrovec leg., AHEC.

Paratypes. Two dissected males, two dissected females, BNHM. In addition, three dissected males, 12 dissected females, AHEC. All 19 specimens with same data as holotype.

Description, external characteristics. Holotype *Anthrenus* (*Anthrenodes*) *translucens* (Fig. 4A), BL = 1.75 mm, BW = 1.25 mm). Single dark brown ocellus at level of top of eyes, lower inner margin of eyes notched. Integument of head and pronotum black except entire posterior margin of pronotum distinctly reddish. Vertex covered in dark brown scales to below level of ocellus, dark below ocellus with scattering of pale translucent milky-white

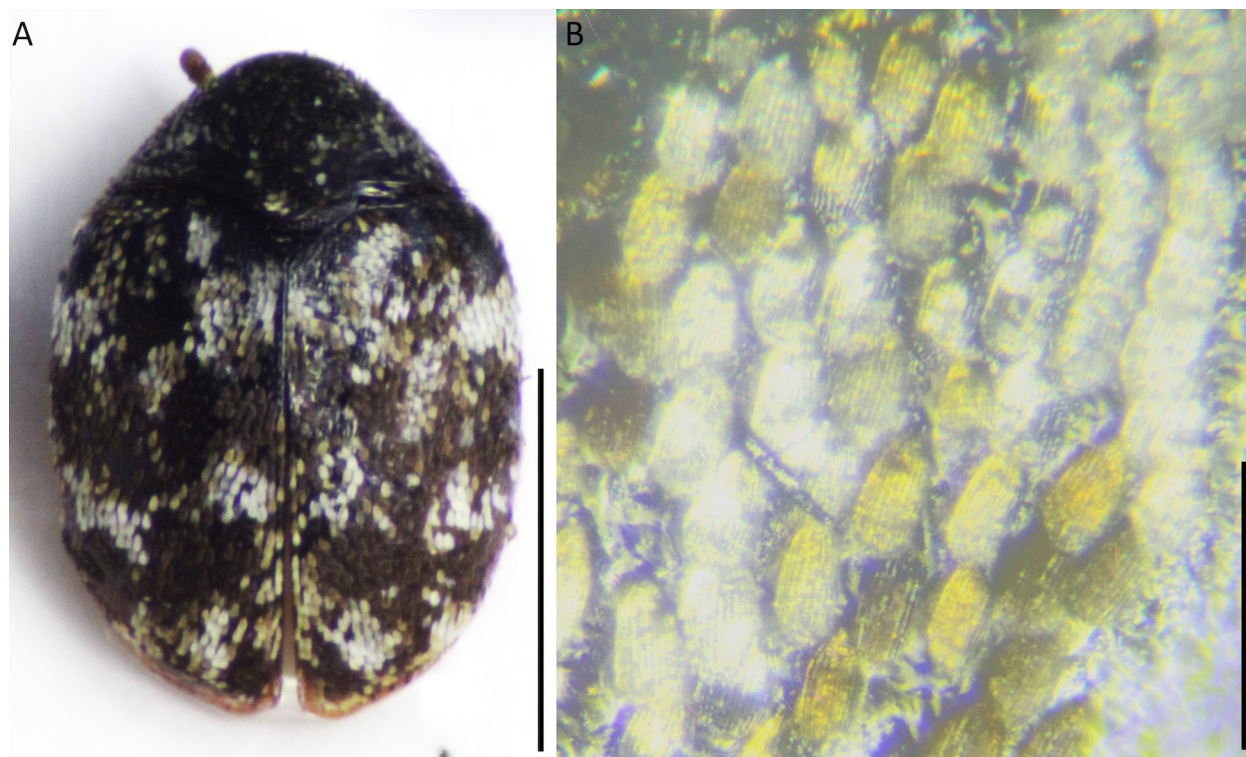


Figure 4. *Anthrenus translucens* n. sp., holotype. **A)** Habitus (scale bar = 1 mm). **B)** Elytral scales (scale bar = 100 μ m).

scales. Pronotum with non-overlapping milky-white, translucent scales across outer thirds of surface, becoming progressively browner towards anterior margin and disc. Wholly non-overlapping brown scales on disc of pronotum. Tiny patch of whitish scales on posterior margin of pronotum in front of scutellar shield. Pale scales mostly parallel sided with convex terminal margin and with a definite translucent quality, appearing very thin, paper like, but highly reflective (*c.f.*, Fig. 1B) through the microscope (Fig. 4B).

Elytral integument dark, becoming browner towards apex, clearly red along apical margin. Three loose bands of white and pale brown scales, sub-basal, sub-medial, pre-apical (Fig. 4A). Sub-basal band starts at anterior corner of lateral margin, extending across elytra to suture. Sub-medial band consists of two loosely connected spots of pale scales. Pre-apical band consists of sub-sutural, pre-apical spot, a lateral marginal spot, and scatterings of pale scales between the two. Other than the pale bands, the elytra are covered in dark brown scales.

Ventrites (Fig. 5A) covered in non-overlapping, whitish, translucent scales. Scale color grades into yellow towards the lateral margins of each ventrite. Denser patches of white scales at lateral margins of ventrites 1 and 2. Spots of brown scales at anterior end of lateral margins of ventrites 2–5.

Antenna with 10 pale brown antennomeres (Fig. 5B). Antennal club with three antennomeres, tear-drop shaped, covered in long hairs that cluster into tufts on ventral side giving antennal club angular appearance. All components of legs brown, anterior faces of tibiae covered in white scales.

Description, internal characteristics. Aedeagus (Fig. 6A) with two rod-like parameres (PL = 306 μ m) joined at anterior margin. From anterior margin, parameres sweep outwards and then posteriorly as dark brown rods. Outer margins of parameres almost parallel to each other. Posterior tips of parameres flat, paler brown and pinched inwards towards tip of median lobe. Tips of parameres tending towards white. Inner margins of paramere tips carrying tiny setae adjacent to and above tip of median lobe. Median lobe (ML = 382 μ m) torpedo-shaped, broad at base, parallel sided to halfway. From halfway, margins converge evenly to rounded, blunt tip that falls short of tips of parameres. Anterior end of median lobe carrying two long sinuous stirrups. Sternite IX (Fig. 6B)

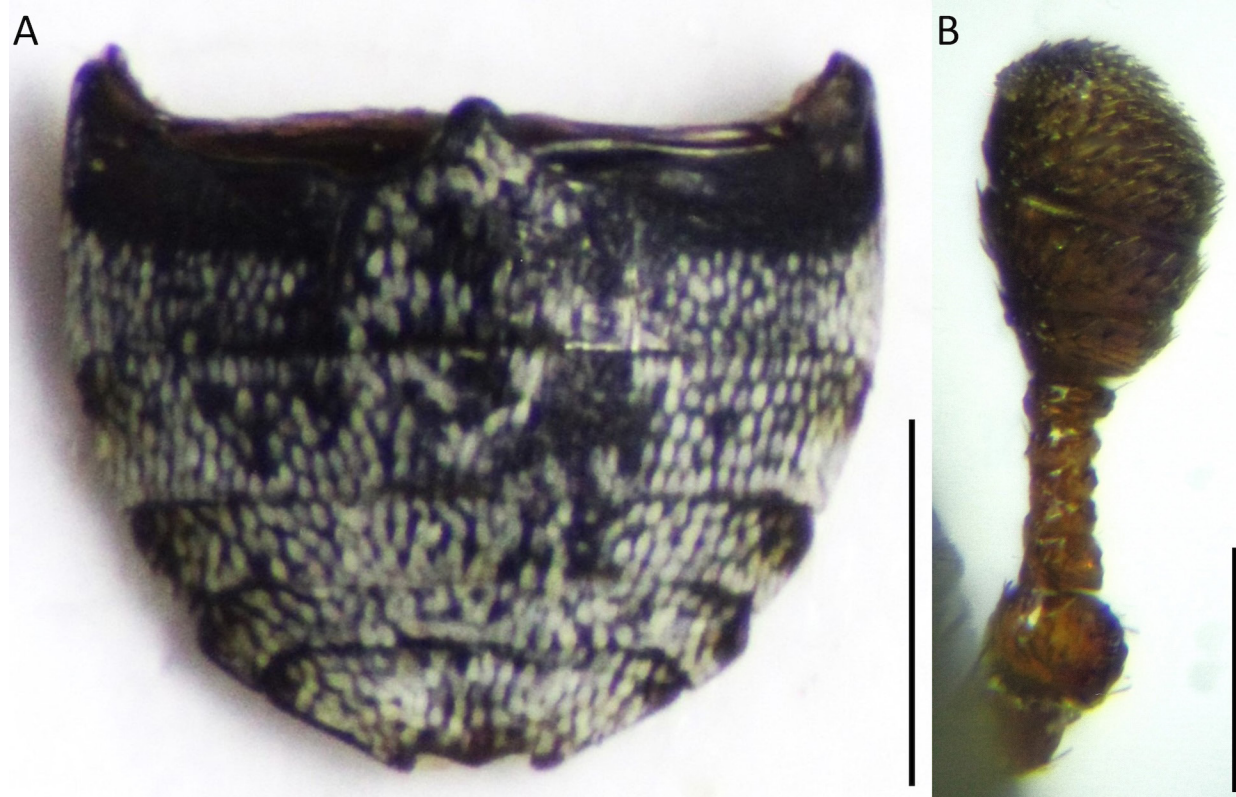


Figure 5. *Anthrenus translucens* n. sp., holotype. **A)** Ventrites (Scale bar = 0.5 mm). **B)** Antenna (scale bar = 100 μ m).

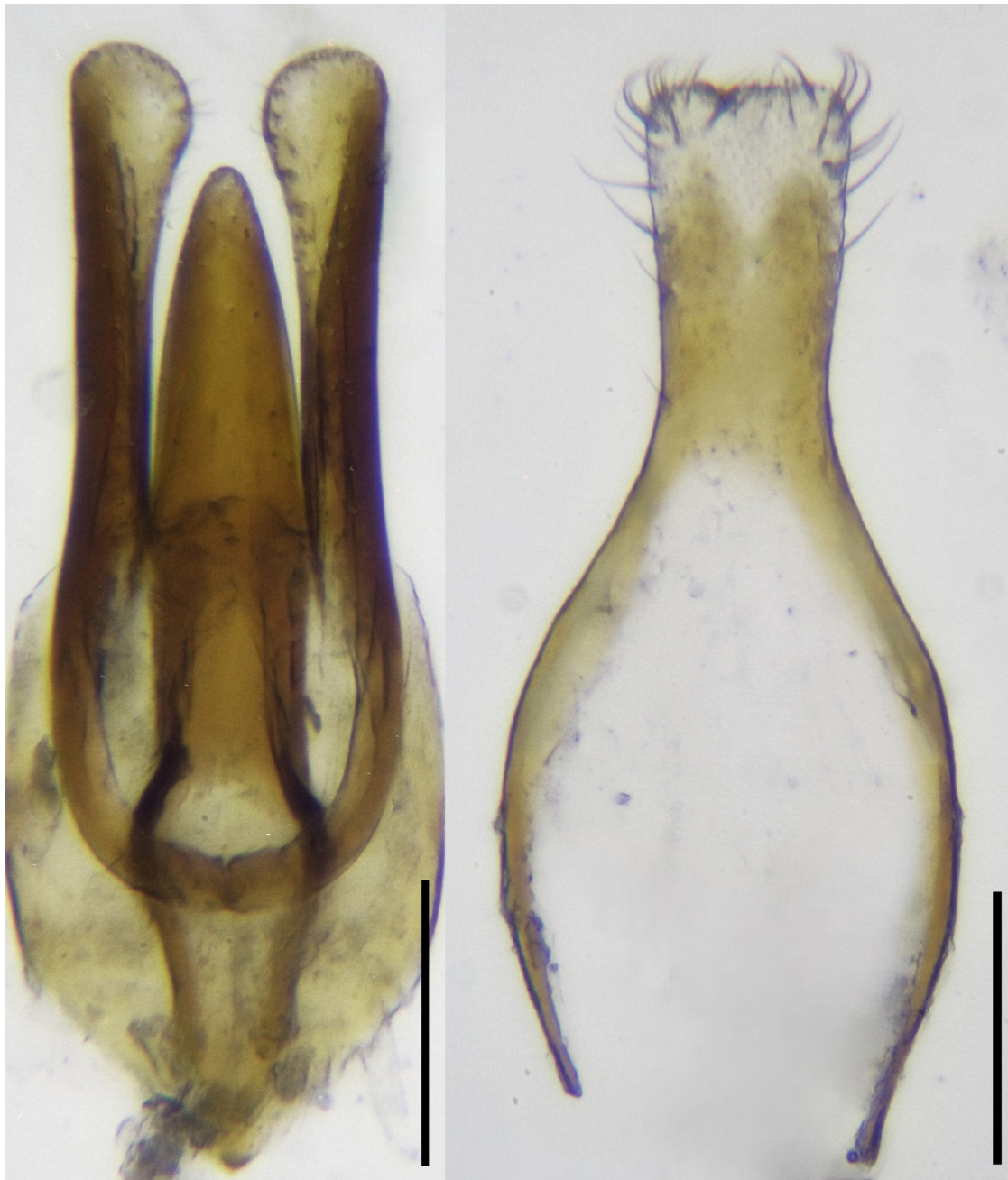


Figure 6. *Anthrenus translucens* n. sp., holotype. A) Aedeagus dorsal aspect. B) Sternite IX. Scale bars = 100 μ m in both cases.

(SL = 396 μ m) with short posterior lobe occupying no more than 1/3 total length of sternite. Posterior margin of posterior lobe white, square with sharpish outer angles. Anterior margin of white tissue of posterior lobe forms sinuate shape as it grades into brown tissue. Long setae emerge mostly from the marginal and sub-marginal white tissue of the posterior lobe. Setae at angles of posterior lobe curve strongly towards centre of posterior margin. Anterior to the white tissue on posterior lobe, sternite IX is pale brown. Most of length of sternite IX consists of two long, evenly curved, very narrow horns.

Etymology. The new species is named after the translucent and reflective quality of the scales.

Differential diagnosis. Two other *Anthrenodes* species with notches on the inner eye margin occur on the southern Arabian Peninsula, *A. wittmeri* Mroczkowski, 1980 and *A. malkini* Mroczkowski, 1980. *Anthrenus wittmeri* is described by Mroczkowski (1980) as being very pale, covered in white and yellow scales. *Anthrenus malkini*, on the other hand, presents a mixture of white, yellow, brown and black scales (Mroczkowski 1980) covering the range of scale colors on the species presented here, hence the confusion with this species. *Anthrenus malkini* has not been well described elsewhere, so a complete set of images is presented here to facilitate comparison.

Anthrenus malkini (Fig. 7A) is covered in white, pale brown, brown and dark brown scales. In particular, the extent of pale brown scales greatly exceeds that found on *A. pica* and *A. translucens*. The ventrites (Fig. 7B) are covered in overlapping white scales which resemble *A. pica* but differ in several ways from *A. translucens* ventrites. The antenna (Fig. 7C) is brown, differing from the dark red of *A. pica*, and has short hairs on the antennal club differing from the long hairs of the antennal club of *A. translucens*.

Anthrenus malkini aedeagus (Fig. 8A) has a broader profile than *A. pica* and *A. translucens*. The parameres are thicker with more setae on the inner margins and sub-margins of the tips of the parameres. The median lobe is shorter than both *A. pica* and *A. translucens* and the margins converge along the length of the median lobe to a very blunt, rounded tip, much blunter than *A. pica* and *A. translucens*. The white tissue at the tip of the sternite IX posterior lobe follows the margins more closely than *A. pica* and *A. translucens*, and does not extend into the posterior lobe disc. The posterior margin of the posterior lobe is rounded rather than flat as in *A. pica* and *A. translucens*, and the sub-marginal setae are stouter than *A. pica* and *A. translucens*. The anterior sternite IX horns are similar to *A. pica* but thicker than *A. translucens*.

Morphometric variation. *Anthrenus malkini* male: mean BL = 1.96 ± 0.13 mm ($n = 4$, range 1.85–2.15 mm), mean BW/BL = 0.719 ± 0.018 (range 0.703–0.744), female: mean BL = 2.07 ± 0.08 mm ($n = 7$, range 1.95–2.20 mm), mean BW/BL = 0.718 ± 0.02 (range 0.690–0.744). No significant difference between males and females for BL $t_9 = 1.73$, ns [not significant] and BW/BL $t_9 = 0.154$, ns.

Anthrenus pica male: mean BL = 2.23 mm ($n = 2$), mean BW/BL = 0.708, female: mean BL = 2.15 mm ($n = 3$), mean BW/BL = 0.69.

Anthrenus translucens male: mean = 1.86 ± 0.127 mm ($n = 7$, range 1.70–2.05 mm), mean BW/BL = 0.706 ± 0.016 (range 0.676–0.725), female: mean 1.95 ± 0.084 mm ($n = 15$, range 1.85–2.10 mm), mean BW/BL = 0.702 ± 0.018 (range 0.658–0.725). Female BL significantly greater than male BL ($t_{20} = 2.42$, $p < 0.05$), no difference between male and female BW/BL ($t_{20} = 0.26$, ns).

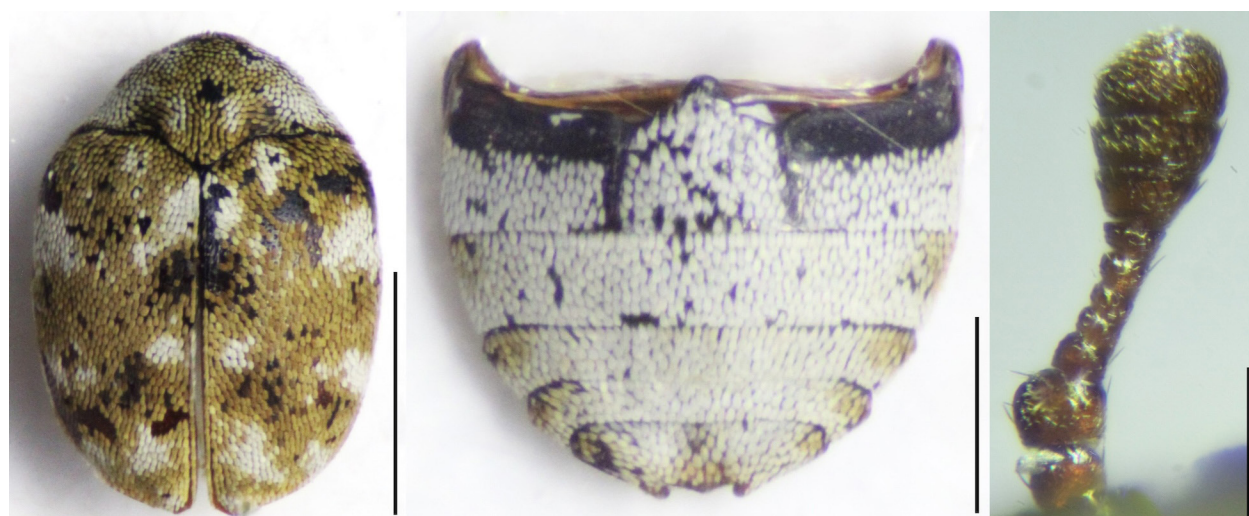


Figure 7. *Anthrenus malkini*. A) Habitus (scale bar = 1 mm). B) Ventrites (scale bar = 0.5 mm), C: antenna (scale bar = 100 μ m).

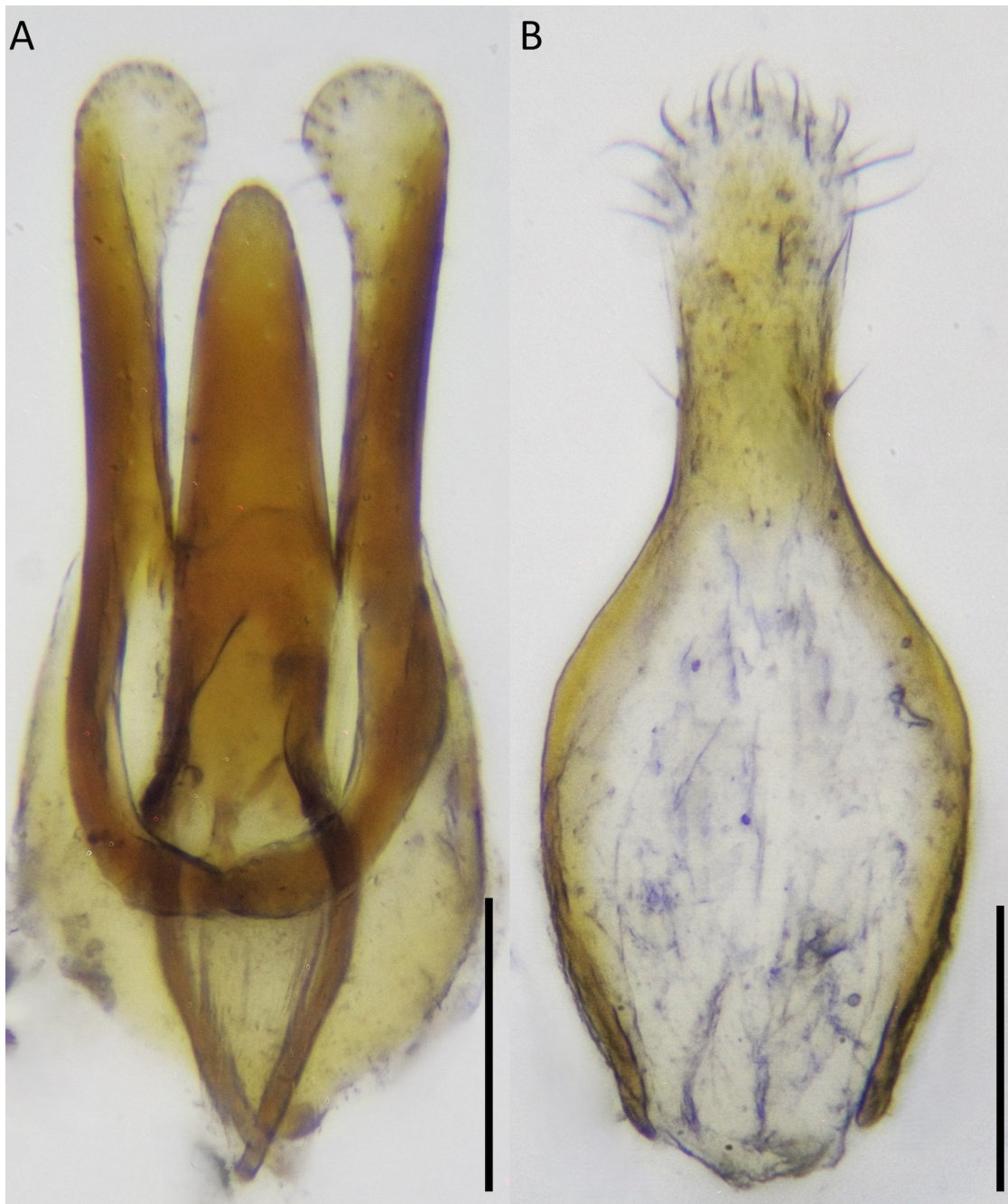


Figure 8. *Anthrenus malkini*. **A)** Aedeagus dorsal aspect. **B)** Sternite IX. Scale bars = 100 μm in both cases.

Anthrenus malkini has significantly greater BL than *A. translucens* ($F_{1,31} = 6.1$, $p = 0.02$) and is significantly broader (BW/BL) than *A. translucens* ($F_{1,31} = 6.2$, $p = 0.02$). The sample size for *A. pica* was insufficient to include in a statistical analysis.

Distribution. Figure 9 shows the points of collection of *A. pica* and *A. translucens* set in the distribution of *A. malkini* (Háva 2024a). Both species sit within the distribution of *A. malkini* adding further assurance that *A. malkini* is the correct comparative species.



Figure 9. Points of collection of *Anthrenus pica* and *Anthrenus translucens* overlaying the distribution of *Anthrenus malkini* (from Háva 2024a).

Discussion

Anthrenus malkini is the only species with notched eye margins and rod-shaped parameres known to overlap the collection locations of *A. pica* and *A. translucens* making it the obvious, and only, species to be confused. In fact, it is very easy to differentiate *A. pica* and *A. translucens* from *A. malkini* on the basis of habitus coloration alone. *Anthrenus malkini* is essentially a pale brown species, and *A. pica* and *A. translucens* are both black and white species. *Anthrenus pica* can be differentiated from *A. translucens* from the structure and distribution density of the scales, particularly on the ventrites. All three species differ in the structures of the genitalia, including sternite IX as shown in Figures 3, 6, and 8. The differences are subtle but consistent and obvious when presented with clear images.

Although the study was concerned with presenting two new species, the opportunity was taken to present information and images on a well-known, but poorly described species. Many Dermestidae fall into this category and insufficient effort has been made to accurately describe common or ‘well-known’ species to facilitate taxonomical studies. Once a species is described appropriately, it is possible to discover other similar species. For example, *A. pimpinellae* (Fabricius, 1775) can now be differentiated from other species including *A. amandae* Holloway, 2019 (Holloway 2019), *A. chikatunovi* Holloway, 2020 (Holloway 2020), and *A. algeriensis* Holloway, 2024 (Holloway 2024). Unravelling taxonomy also facilitates a better understanding of true distributions (Holloway et al. 2021, 2023). Recently, several *Anthrenodes* species have been described from the Arabian Peninsula (Háva 2024b). It is important that all these species are well-described to avoid cryptic species remaining undiscovered.

Anthrenodes species currently known from southern Arabian Peninsula:

Anthrenus buettikeri Mroczkowski, 1980

Anthrenus haladai Háva, 2024

Anthrenus hulai Háva, 2017

Anthrenus malkini Mroczkowski, 1980

Anthrenus maribensis Háva, 2024

Anthrenus pica Holloway and Herrmann, **new species**

Anthrenus pulchellus Gestro, 1889

Anthrenus translucens Holloway and Herrmann, **new species**
Anthrenus wittmeri Mroczkowski, 1980

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