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ANTHRENUS (*ANTHRENODES*) *BICOLOR* (COLEOPTERA: DERMESTIDAE: MEGATOMINAE), A NEW SPECIES FROM JORDAN

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[Holloway, G. J. 2026. *Anthrenus* (*Anthrenodes*) *bicolor* (Coleoptera: Dermestidae: Megatominae), a new species from Jordan. Munis Entomology & Zoology, 21 (1): 1-8**]**

ABSTRACT: A new species, *Anthrenus* (*Anthrenodes*) *bicolor* Holloway (Coleoptera: Dermestidae: Megatominae) is described from Jordan and compared with *A. ineptus* Háva & Tezcan, 2004, *A. israelicus* Háva, 2004, and *A. jordanicus* Pic, 1934, the most likely confounding species from the region. Differentiation is performed using habitus coloration, antennal and genital structure. Images of habitus, ventrites, antenna, and male and female genital structures are presented. *Anthrenus bicolor* represents only the second *Anthrenodes* species discovered from Jordan.

KEY WORDS: *A. ineptus*, *A. israelicus*, *A. jordanicus*, dissection, identification, new species, taxonomy

The number of known species of Dermestidae is approaching 2000 (Háva, 2025). Within the Dermestidae is the large genus *Anthrenus* Geoffroy, 1762 with about 300 species. *Anthrenus* is split into ten subgenera, a split based mostly on number of antennal segments (Peacock, 1993). One of these subgenera is *Anthrenodes* Chobaut, 1898, a medium-sized subgenus containing 41 species (Háva, 2025) and characterized as having 10 antennomeres. The rate of recent discovery of *Anthrenodes* species has been high with 25 species described since the year 2000. Most *Anthrenodes* species are found in Asia with a few species scattered along north Africa and into West Africa. Europe has one *Anthrenodes* species, *A. sarnicus* Mroczkowski, 1963 (Holloway & Pinniger, 2024), which is only found in north-west Europe so represents an outlier species. Three *Anthrenodes* species are found in eastern Mediterranean countries: *A. ineptus* Háva & Tezcan, 2004, *A. israelicus* Háva, 2004, and *A. jordanicus* Pic, 1934. In the current study, a fourth species, *Anthrenus* (*Anthrenodes*) *bicolor* sp. nov. is added to the list of *Anthrenodes* species from eastern Mediterranean countries.

MATERIALS AND METHODS

Specimens from Jordan were borrowed from the Staatliches Museum für Naturkunde, Stuttgart, Germany for study. Specimens were floated from staging using water prior to maceration and dissection. Each specimen was macerated in 5% acetic acid for one day. 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

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the harder ventrites to expose the genitalia. For males, the aedeagus was detached from the ring sclerite, and then sternite IX was detached from the ring sclerite and the aedeagus. For females, the ovipositor and bursa copulatrix were removed. Habitus images, both upper and lower sides, were captured at ×20 magnification using a Canon EOS 2000D camera mounted on the BMSL microscope, the image of the head was captured at ×63. Male genitalia and bursa copulatrix were cleaned in potassium hydroxide (KOH) for 40 minutes. Images of genitalia and contents of the bursa copulatrix were captured at ×200 and ×100 magnification, respectively, using a Canon EOS 1300D camera mounted on a Brunel monocular SP28 microscope. The aedeagus was suspended in glycerol for the dorsolateral image. After dissection, all body parts were mounted on card. The antennae were teased out and images were taken at ×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.
- Body width (BW): distance across widest part of abdomen.
- 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 map created using Shorthouse (2010). Scale bars added using ImageJ 1.53M (Schneider et al., 2012). AHEC = Andreas Herrmann's Entomological Collection. NHMUK = Natural History Museum, London, UK. SMNS = Staatliches Museum für Naturkunde, Stuttgart, Germany.

RESULTS

Of the specimens studied, five were *A. bicolor*.

Taxonomy

Dermestidae Latreille, 1803
Megatominae Dalla Torre, 1911
Megatomini Leach, 1815
Megatomina Leach, 1815
Anthrenodes Chobaut, 1898

Anthrenus (*Anthrenodes*) *bicolor* Holloway sp. nov.

(Figs. 1-4)

Type specimens. Holotype male. Jordan (West), Wadi El Kelt (31.846, 35.418), 26.iii.1965 J. Klapperich leg. [SMNS].

Paratypes. Four females, Jordan (West), Wadi El Kelt (31.846, 35.418), 16.iv.1965 J. Klapperich leg. [two specimens SMNS, one specimen NHMUK, one specimen AHEC].

Description of holotype.

BL = 2.75 mm, BW = 1.75 mm (BW/BL = 0.64) (paratypes BL = 1.95 –2.5 mm). Overall impression, two-tone beetle (Fig. 1A) with dark head and pronotum integument with many brown scales, elytra with dark brown integument basally but red thereafter to apices with very few brown scales. Two-tone coloration enhanced when specimen is wet. No discernible coloration difference between males and females. Vertex (Fig. 1B) with pale greyish-yellow scales, darker yellow and brown scales form a band across upper face inking eyes just above reddish centrally positioned ocellus. Yellow scales encircle ocellus. Greyish-yellow scales along inner margins (un-notched) of eyes and antennal bases. Patches of yellow scales along lower edge of clypeus. Labrum red. Pronotum with brown scales along with scattered yellow and orange scales. Strip of slightly paler scales along outer edge of sinuous posterior margin. Scales overlapping, white, yellow and orange. White scales arranged in three loose, faint, horizontal fasciae, one sub-basal, another sub-medial, the third sub-apical. Fasciae set in background of admixed yellow and orange scales.

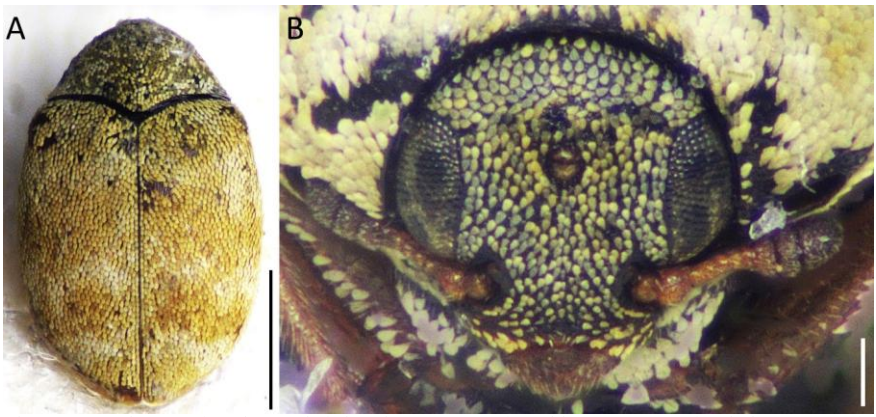

Figure 1. *Anthrenus* (*Anthrenodes*) *bicolor* sp. nov. A) Habitus paratype (scale bar = 1 mm). B) Head holotype (scale bar = 100 µm).

Ventrites (Fig. 2A) dark integument covered in overlapping, broad, rounded, white, cream, yellowish and greyish scales. No patches of dark scales at lateral ventrite margins, or at apex of ventrite 5. Antenna (Figs. 1B, 2B) with 10 antennomeres (female antenna in figure 2B with antennomeres 4 and 5 partially fused but all other females with 10 separated antennomeres), antennomeres 1-7 pale red, terminal three antennomeres forming well-defined brownish club. Terminal antennomere in male slightly longer than terminal antennomere in females. Legs entirely red with pale scales on ventral surfaces of femora.

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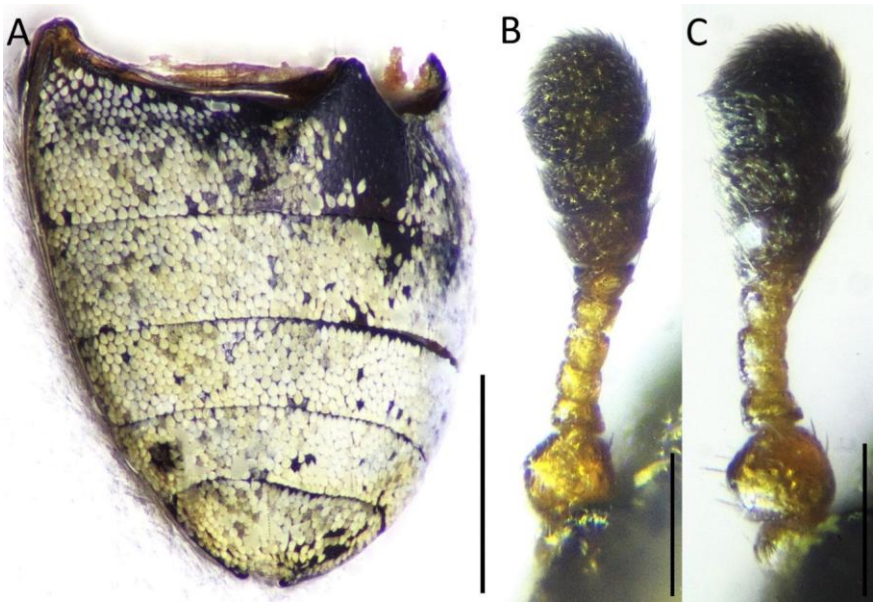

Figure 2. *Anthrenus* (*Anthrenodes*) *bicolor* sp. nov. A) Ventrites ventrolateral aspect paratype (scale bar = 0.5 mm). B) Antenna holotype (scale bar = 100 µm).

Aedeagus (Figs. 3A, 3B) small, broad, parameres (PL = 300 µm) splaying out from V-shaped base, diverging (but evenly curved from halfway) until just before sharp paramere tips. Aedeagus brown apart from spot of pale tissue at paramere apex. Large, spikey setae on inner side of paramere apices and short way down inner margin (Figs. 3A, 3B). Median lobe (ML = 220 µm) broad and short. Sinuate margins converging from broad base to sharp tip on ventral side. Median lobe forms right-angled bend towards dorsal (Fig. 3B), hooked tip of median lobe resembles a pick. Median lobe with two straight stirrups pointing anterior, extending beyond paramere base, and which join halfway along median lobe.

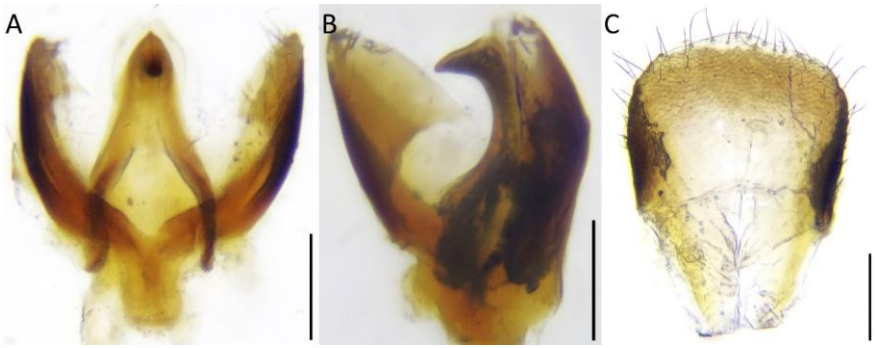

Figure 3. *Anthrenus* (*Anthrenodes*) *bicolor* sp. nov. holotype. A) Aedeagus dorsal aspect. B) Aedeagus dorsolateral aspect. C) Sternite IX. All scale bars = 100 µm.

Sternite IX (SL = 340 µm) longer than aedeagus. Sternite IX broad and strongly cupped to wrap around ventral surface of aedeagus. Central part of convex posterior margin white and lined with long setae. Tissue behind posterior margin brown, brown tissue spreads out to and along lateral margins to end with two straight, converging anterior horns. Disk consisting of whitish tissue.

The bursa copulatrix contains four large sclerites (Fig. 4A), two bow-shaped (Figs. 4B, 4D), one flat with a central extended ridge (Fig. 4C), and one with a heavily bowed base topped with a long conical, flattened flange (Fig. 4E). The sclerites are arranged in the bursa copulatrix as shown in Fig. 4A, with the bowed sclerites either side of the conical sclerite and the flat sclerite off to one side (or above). The sclerites are long, the bowed sclerites measure 450 µm, much longer than the aedeagus (Figs. 3A, B) and are adorned with arrow-shaped heads, hooks and ridges.

Figure 4. Sclerites in paratype bursa copulatrix. A) Four sclerites showing arrangement in bursa copulatrix, B – E) Images of individual sclerites.

Distribution. Figure 5 shows the location from where the type specimens of *A. bicolor* were collected in Jordan. Also shown are the distributions of three potential confounding species (according to Háva, 2025) that bear a passing resemblance to *A. bicolor*. *Anthrenus ineptus* occurs to the north of Jordan, east into Iran, *A. israelicus* extends from Israel west across north Africa, and *A. jordanicus* occurs in Egypt, Israel, Jordan and Iran.

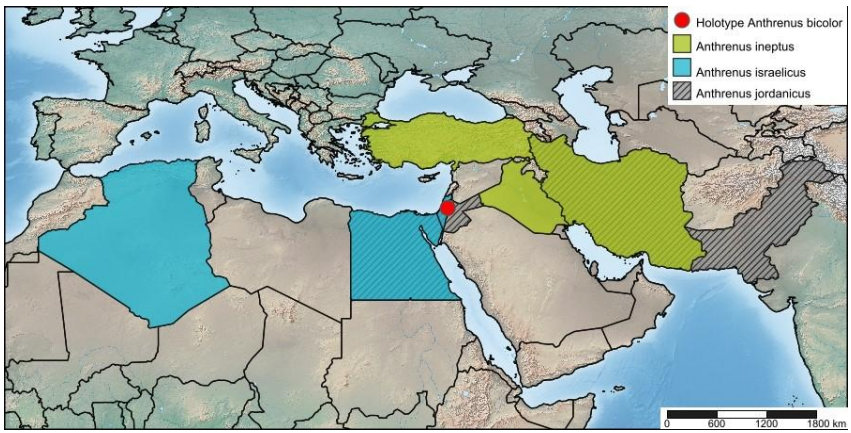

Figure 5. Distributions of *Anthrenus bicolor* (current study), *A. ineptus*, *A. israelicus* and *A. jordanicus* (Háva, 2025).

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Etymology. The specific epithet refers to the two-toned appearance of the habitus.

Differential diagnosis. The three potential confounding species are shown in figure 6. Both *A. ineptus* (Fig. 6A) and *A. jordanicus* (Fig. 6C) are covered in pale fawn-coloured scales. *Anthrenus israelicus* (Fig. 6B) has three white fasciae but they are well-defined against a background of uniform bright orange scales. There are large white patches of scales on the outer sides of the pronotum and the orange scales on the pronotum are the same colour as the orange scales on the elytra. *A. ineptus* and *A. jordanicus* aedeagi (Figs. 6D and 6F, respectively) have rod-shaped parameres. Only *A. israelicus* (Fig. 6E) has an aedeagus resembling *A. bicolor*. None of the potential confounding species have all (or any) features aligning with *A. bicolor*.

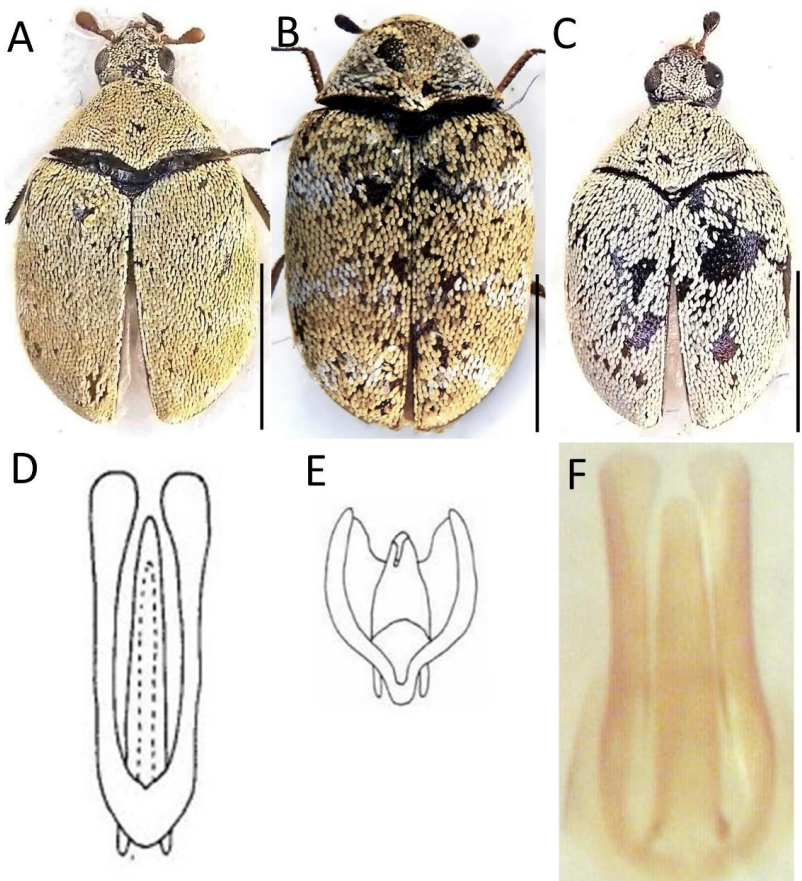

Figure 6. Habitus (Herrmann, 2025). A) *Anthrenus ineptus*. B) *Anthrenus israelicus*. C) *Anthrenus jordanicus*. Habitus scale bars = 1 mm. Aedeagi. D) *Anthrenus ineptus* (Háva & Tezcan, 2004). E) *Anthrenus israelicus* (Háva, 2004). F) *Anthrenus jordanicus* (Herrmann, 2025).

DISCUSSION

Anthrenus bicolor is distinctive and quite easy to separate from other species in the region. The aedeagus is very small, but not unusually so compared with some other *Anthrenodes* species (see Holloway & Pinniger, 2024). Features differentiating these small, triangular aedeagi from each other are often subtle, but the sclerites in the bursa copulatrix are substantial and intricate. Female features are usually overlooked but, in this case, they are obvious and informative. Only one other *Anthrenodes*_bursa copulatrix has been studied, *A. sarnicus* (Holloway & Pinniger, 2024) which has large sclerites, but they differ substantially from the sclerite described here. Holloway & Pinniger (2024) described four large sclerites in the bursa copulatrix of *A. sarnicus*, including sclerite one that had evolved to resemble a horn, presumably to receive the hooked tip of the aedeagus. No horn-shaped sclerite was found in *A. bicolor* and it is not clear how the sclerites operate to interact with the aedeagus during copulation. Figure 4A, however, does provide an indication how the sclerites might occupy the bursa copulatrix with respect to each other.

Complex bursa copulatrix sclerites might not be limited to *Anthrenodes*. Holloway & Herrmann (2025) found a complicated set of sclerites in *A. Anthrenops trilineatus*, but in this case rather than a horn-shaped sclerite (as in *A. sarnicus*), the bursa copulatrix contained a cone with an open, doughnut-shaped apex, presumably again for receipt of the hooked tip of the median lobe. Not only are the contents of the bursa copulatrix fascinating and indicate how mating occurs, but it also suggests that it's the female who makes the decision on whether to accept a male and quite likely its mate choice that drives the speciation process. It can be difficult extracting the sclerites from a bursa copulatrix but worth the effort because in some cases it might be easier to differentiate among species using female characteristics rather than the male.

It is more straight-forward to extract the male sternite IX which is an essential character that should be considered whenever a new *Anthrenus* species is described. Unfortunately, sternite IX is often ignored (and sometimes discarded) even though it is a male structure involved in the mating process, but it always provides important and informative information.

The current study brings the number of knows *Anthrenodes* species from Jordan to two: *A. bicolor* and *A. jordanicus*, and the total number of known *Anthrenodes* species to 42.

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