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## A new species of *Trichoxys* Chevrolat (Cerambycidae: Cerambycinae: Clytini) from Mexico, with a key to known species

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*Abstract.* The cerambycine genus *Trichoxys* Chevrolat is diagnosed and a new species from Mexico, *T. penrosei* Lingafelter & Wappes, is described. *Trichoxys ochraetheoides* Linsley 1935 is a new synonym of *T. hirtellus* (Chevrolat 1860). Photos of the elytra of all 15 *Trichoxys* species are provided, along with a key to species.

*Key Words.* Insecta, Coleoptera, Cerambycidae, Cerambycinae, Clytini, *Trichoxys*, new species, key.

*Resumen.* Se redefine el género *Trichoxys* Chevrolat y describimos una especie nueva de México, *T. penrosei* Lingafelter & Wappes. *Trichoxys ochraetheoides* Linsley 1935 es una sinonimia nueva de *T. hirtellus* (Chevrolat 1860). Se incluye fotos dorsales de los élitros de las 15 especies de *Trichoxys*, y una clave para separar las especies.

*Palabras claves.* Insecta, Coleoptera, Cerambycidae, Cerambycinae, Clytini, *Trichoxys*, especies nuevas, clave.

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### INTRODUCTION

*Trichoxys* was first proposed by Chevrolat (1860) as a “division” of the genus *Clytus* Laicharting. In that study, he expressed surprise that others had not recognized *Trichoxys*, and his other “divisions”, as fully established genera. Thomson (1861: 219) treated *Trichoxys* as a genus and designated *T. bilineatus* (Chevrolat) as type species.

In the latest catalog and checklist of the Western Hemisphere Cerambycidae, there are 15 species of *Trichoxys* listed (Monné 2005, Monné & Bezark 2011). These species include: *Trichoxys abbreviatus* Bates, *T. apelles* (Newman), *T. atripes* (Chevrolat), *T. bilineatus* (Chevrolat), *T. hirtellus* (Chevrolat), *T. labyrinthicus* (Chevrolat), *T. longipes* Chemsak & Linsley, *T. melanotelus* (White), *T. ochraetheoides* Linsley, *T. pellitus* (White), *T. rubripes* (White), *T. sulphurifer* (Chevrolat), *T. viridicollis* (Chevrolat), *T. vitticollis* (Laporte & Gory) and *T. westwoodii* (Chevrolat). These species are distributed primarily in Mexico (especially southern and western states) with the following exceptions: *T. viridicollis* is not known from Mexico and occurs from Guatemala to Panama, and *T. abbreviatus*, *T. apelles* and *T. labyrinthicus* have ranges that extend from Mexico into Honduras.

Here we provide a diagnosis of the genus, recognize one new synonymy based on examination of type material, describe one new species and provide a key to the 15 species currently known.

## METHODS AND MATERIALS

The following institutional and private collections (with acronyms used in this paper) were consulted in this study:

- ACMT - American Coleoptera Museum (San Antonio, Texas, U.S.A.)
- BMNH - The Natural History Museum (London, United Kingdom)
- CASC - California Academy of Sciences (San Francisco, California, U.S.A.)
- CMNH - Carnegie Museum of Natural History (Pittsburgh, Pennsylvania, U.S.A.)
- EFGC - Edmund F. Giesbert Collection (at FSCA), (Gainesville, Florida, U.S.A.)
- EMEC - Essig Museum of Entomology (Berkeley, California, U.S.A.)
- FSCA - Florida State Collection of Arthropods (Gainesville, Florida, U.S.A.)
- SWLC - Steven W. Lingafelter Collection (North Potomac, Maryland, U.S.A.)
- TAMU - Texas A&M University Insect Collection (College Station, Texas, U.S.A.)
- UNAM - Universidad Nacional Autónoma de México (Chamela, Jalisco, Mexico)
- USNM - National Museum of Natural History, Smithsonian Institution (Washington, District of Columbia, U.S.A.)

The holotype of the new species is deposited in the USNM and paratypes are deposited in the ACMT, CASC, FSCA and SWLC. Four plates of figures are provided as a basis for taxonomic decisions and diagnoses. Label data is semi-verbatim with line spaces separated by commas and abbreviated localities and dates spelled out for clarity. Measurements were made using Axiovision software (version 4.8.2) on images taken with a Zeiss AxioCam HRc camera attached to a Zeiss Discovery.V20 stereomicroscope with Sycop motorized zoom and focus control and a PlanApo S 0.63X objective (all equipment and software: Frankfurt, Germany).

## DISCUSSION

Genus *Trichoxys* Chevrolat  
(Figs. 1–4)

*Trichoxys* Chevrolat 1860: 454; Thomson 1861: 219; Lacordaire 1868: 63.

Type-species: *Clytus (Trichoxys) bilineatus* Chevrolat 1860 (designated by Thomson 1861: 219).

*Diagnosis.* *Trichoxys* Chevrolat is characterized from other Clytini by 1) the abruptly recessed parasutural region of the elytron that starts at the anterior one-third and diverges more widely to the apex where it is approximately one-third of the discal width, and the strongly elevated anterior portion of the mesosternum (appearing abruptly recessed from ventral view) and 2) the evenly rounded pronotum that is distinctly narrower than the elytral base and without calli or lateral asymmetry. All the known species have bold, pubescent patterns on the elytra and these patterns are easily diagnostic for each species.

*Anthoboscus* Chevrolat, *Dexitheia humeralis* Chemsak & Noguera, *Placosternus* Hopping, *Plagionotus astecus* (Chevrolat) and some *Ochraethes* Chevrolat also have a sutural depression and bold pubescent patterns that are similar to those in *Trichoxys*. Aside from isolated works such as Chemsak & Linsley 1974, the Mexican and Central American Clytini have not been recently treated comprehensively and are in need of revision. Some species of Clytini have been described and placed in genera that do not conform to the generic characters (and further, some genera never had clearly defined characters). Consequently, future work will mandate new combinations, in particular, some species of *Ochraethes* (for example, *O. obliquus*

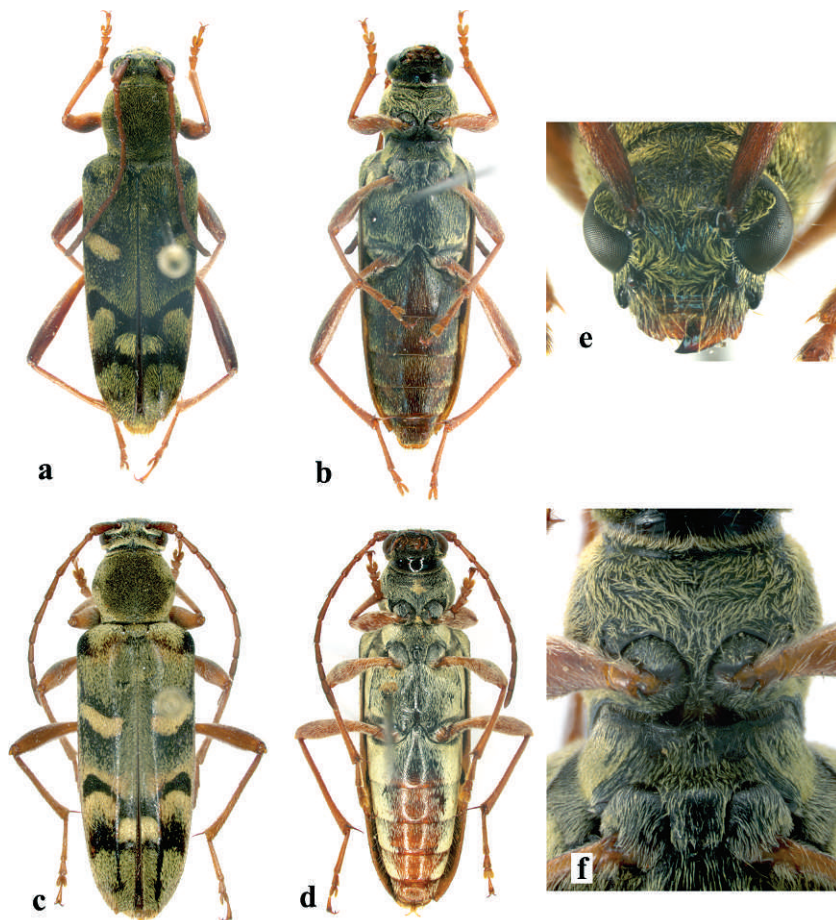


Figure 1. *Trichoxys penrosei* Lingafelter & Wappes, **sp. nov.** a) dorsal habitus of holotype female, b) ventral habitus of holotype female, c) dorsal habitus of paratype female; d) ventral habitus of paratype female, e) anterior view of head of holotype, f) thoracic sternum of holotype.

(Chevrolat) and *O. umbratilis* Bates), will probably need to be transferred to *Trichoxys*. However, further examination of the types will be necessary to make these revisionary treatments, and that is beyond the scope of this paper.

**Remarks.** Based on our examination of photographs of the holotype of *Trichoxys hirtellus* (Chevrolat 1860) (Fig. 2a) and the holotype of *T. ochraetheoides* Linsley 1935 (Fig. 2b), we can find no differences to warrant their separate species status. All elytral maculations are in the same position and are the same shape for each holotype. The only differences are that the middle transverse macula is somewhat broken and abbreviated in *T. hirtellus* (complete in *T. ochraetheoides*) and the subbasal transverse macula is less broad in *T. hirtellus* as compared to *T. ochraetheoides*. All other features of the elytra, antennae, legs and pronotum are identical. Therefore, *T. ochraetheoides* Linsley is a **syn. nov.** of *T. hirtellus* (Chevrolat).

Our examination of photographs of the holotypes of *T. melanotelus* (White) and *T. atripes* (Chevrolat) indicate that these species apparently differ in only subtle ways. The spacing between the light colored pubescent bands of *T. melanotela* is

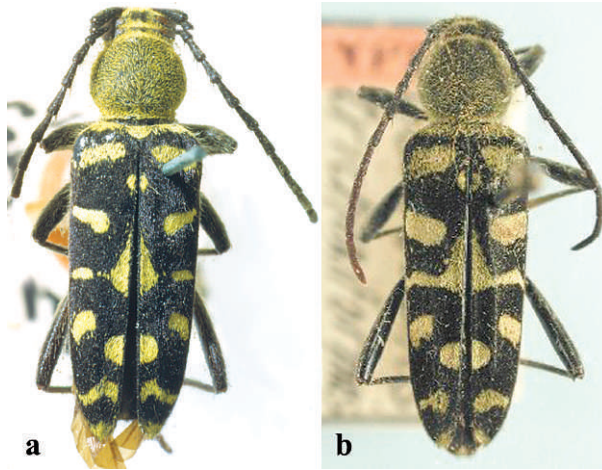


Figure 2. Holotypes of a) *Trichoxys hirtellus* (Chevrolat 1860) and b) *T. ochraetheoides* Linsley 1935.

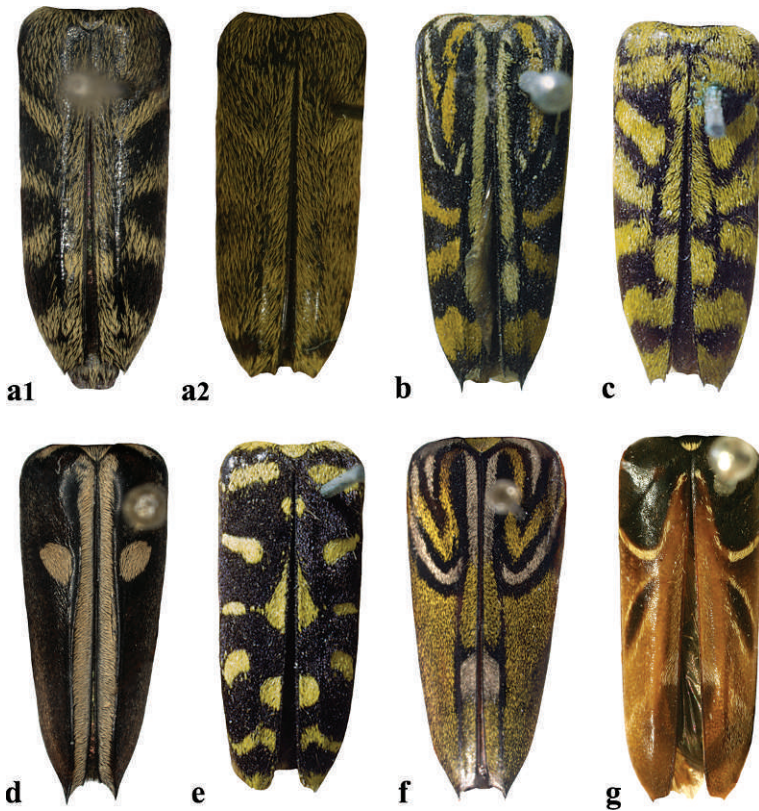


Figure 3. Elytra of *Trichoxys* species. a1) *Trichoxys abbreviatus* Bates (maculate morphotype), a2) *Trichoxys abbreviatus* Bates (immaculate morphotype), b) *Trichoxys apelles* (Newman), c) *Trichoxys atripes* (Chevrolat), d) *Trichoxys bilineatus* (Chevrolat), e) *Trichoxys hirtellus* (Chevrolat), f) *Trichoxys labyrinthicus* (Chevrolat), g) *Trichoxys longipes* Chemsak & Linsley.



Figure 4. Elytra of *Trichoxys* species. h) *Trichoxys melanotelus* (White), i) *Trichoxys pellitus* (White), j) *Trichoxys penrosei* Lingafelter & Wappes, **sp. nov.** k) *Trichoxys rubripes* (White), l) *Trichoxys sulphurifer* (Chevrolat), m) *Trichoxys viridicollis* (Chevrolat), n) *Trichoxys vitticollis* (Laporte & Gory) and o) *Trichoxys westwoodii* (Chevrolat).

greater than the band widths themselves whereas in *T. atripes*, the bands are much broader than the spaces between them. For the purposes of this paper, we maintain them as distinct, but further study may support their synonymy.

*Trichoxys penrosei* Lingafelter & Wappes, **sp. nov.**

(Figs. 1, 4j)

*Diagnosis.* This species is most easily differentiated from the other species of *Trichoxys* in having the elytra mostly densely pubescent with a bowl-shaped yellowish patch antemedially that does not extend to the sutural or lateral margins and that is surrounded by a diffuse black margin. Further, the elytra have a dense patch postmedially at the suture that is surrounded by a region of black (not yellow) setae extending anterolaterally in a hook-like pattern and laterally nearly to the margin in a broad fascia (Figs. 1a, 1c). Although the boldness of the pubescence does vary among individuals, no other species of *Trichoxys* has this unusual pubescent pattern. Based on the elytral pattern, *Trichoxys penrosei* is very similar to *Ochraethes obliquus* (Chevrolat). However, that species has uniformly black antennae, femora that are partly black dorsally and reddish brown elsewhere, and an elytral base with two rather distinct transverse yellowish or whitish fasciae

separated by a transverse black or reddish brown fascia covered with black setae. *Trichoxys penrosei* is also similar to *Ochraethes umbratilis* Bates in that most specimens of both species have elytra densely clothed with yellowish to greenish pubescence, however, the latter lacks the lateral, broad fasciae that extend nearly to the margin and has the sutural depression much less defined.

*Description.* 12.8–16.3 mm long; 3.8–5.3 mm wide at humeri ( $n = 16$ ). Color: Dorsal integument of head, pronotum, elytra and most of venter black (elytra rarely with reddish brown spot at base); femora and scape dark reddish brown, occasionally light reddish brown; tibiae, tarsi and flagellomeres usually light reddish brown, but dark reddish brown in some specimens; apical ventrites and occasionally middle of basal ventrites reddish brown. Most of integument covered in pattern of yellow pubescence obscuring integument in places (some specimens melanistic with less yellow and more black pubescence and others with a pale green tinge to the pubescence). Head: with few scattered punctures throughout, denser on frons and occiput; scattered yellow pubescence variably dense among specimens; pubescence usually mostly lacking on and between weakly elevated antennal tubercles; frons and gena short, broad, without projection laterally; gula broad with anterolateral margins ventrally projected near base of mandible; with poorly defined or absent frontal-genal ridge; interantennal groove or depression moderately developed, extending onto frons and vertex; eye strongly emarginate around antennal tubercle with lower lobe over  $2\times$  longer than upper lobe at narrowest point; eyes moderately protuberant but distinctly narrower than pronotum, very finely faceted; antenna 11-segmented, without spines, short, just surpassing middle of elytra in most males and not attaining the middle in most females; scape short, just surpassing anterior pronotal margin; antennomere 2 short, but over one-third length of antennomere 3; antennomere 4 distinctly shorter than 3 and 5, 5–7 subequal to one another and longer than 8–11; 9–11 relatively elongate in males, shortened and thickened in females; moderately dense, short, appressed setae throughout antennomeres; scattered suberect pale and dark setae present, particularly on mesal margins and apices. Mandible moderately produced, reddish brown with piceous apex and base, covered with yellow setae on outer surface; palpi moderately elongate; terminal palpomeres moderately dilated. Pronotum: Not glossy; covered with very small, contiguous punctures throughout; in addition to conspicuous yellow pubescence, most dense on sides and posterior margin, pubescence interspersed by short, suberect black setae and sparse, long, erect setae; without calli or tubercles; widest at middle; about as wide as long; pronotal length, 2.3–3.2 mm, pronotal width, 2.6–3.5 mm (pronotal length:width = 0.8–0.9); only slightly more constricted at base than apex; base much narrower than elytral base. Prosternum: Glossy, indistinctly punctate; integument mostly covered by appressed yellow (or rarely white) pubescence; prosternal process narrow and recessed between procoxae; apex slightly expanded behind; procoxal cavities widely open posteriorly. Elytron: Mostly covered in yellow pubescence with a faint green tinge forming pattern as follows (note that the boldness of the pattern varies among specimens, and some specimens don't have all the features as described): dense bowl-shaped spot antemedially, but not extending to sutural or lateral margin and surrounded by margin of black; dense spot postmedially at suture that is surrounded by region of black (not yellow) setae that extend anterolaterally in a hook-like pattern and laterally to near margin in broad fascia; apical one-fourth mostly covered in yellow pubescence except for vague black

interruption at middle; basal one-fourth mostly covered in yellow pubescence except for vague black humeral spot. Parasutural region of elytron abruptly depressed, starting at anterior one-third and diverging more widely to apex where it is approximately one-third of discal width; apex obliquely truncate with weak apicolateral spine and sometimes weak sutural spine or projection; elytron length, 9.2–11.3 mm; width, 1.9–2.6 mm; elytral length:width, 4.3–4.8. Scutellum: Broadly rounded posteriorly; variably covered with yellow (and less commonly black) pubescence. Legs: Femora gradually enlarged; metafemur attaining posterior one-third of elytron; pro- and mesofemora much shorter; tibiae approximately straight, not expanded apically; metatibia longest, mesotibia intermediate in length, protibia shortest; tibiae each with two pronounced, asymmetrical, divergent tibial spines. Venter: Moderately to densely yellow pubescent (rarely intermixed with white pubescence) except for middle of sternites and middle of metasternum which are mostly glabrous. Mesosternal intercoxal process broad (about half as wide as mesocoxa); without lateral projections into mesocoxae; anterior margin of mesosternum strongly elevated. First abdominal ventrite longest with remaining ones gradually decreasing in length; apex of ventrite 5 broadly rounded, without notch, sulcus, or other modification in either sex.

*Etymology.* We name this species in honor of Dick Penrose, enthusiastic West Coast collector who had a special passion for longhorned beetles. The specific epithet is a noun in apposition.

*Specimens Examined.* Holotype (female): Mexico, Durango 50 km NE La Cap. de Taxte, 1 October 1990, J. E. Wappes (USNM). Paratypes (15 specimens): Mexico, Durango 50 km NE La Cap. de Taxte, 1 October 1990, J.E. Wappes (ACMT, 1 female; SWLC, 1 male, 1 female); Mexico, Sinaloa, 3 km SW El Palmito, 18 October [no year], F.T. Hovore, coll. (CASC, 5 females, 1 male); Mexico, Durango, 3 km W El Palmito, 2–3 October 1976, E. Giesbert, coll. (FSCA [EFGC], 3 females; EMEC, 1 male); Mexico, Durango, 3 km W. El Palmito, 2–9 October 1976, E. Giesbert, coll. (FSCA [EFGC], 1 female, EMEC, 1 female).

*Remarks.* This species is known only from the states of Durango and Sinaloa in west-central Mexico. All specimens were collected in October. It displays little sexual dimorphism as compared to some other longhorned beetles: in males, antennomeres 9–11 are relatively elongate and more narrow compared to females which have them short and thickened; males have the antennae surpassing the middle of the elytra and females usually have the antennae ending before the middle of the elytra. The general pubescent pattern is consistent, although some specimens have relatively more black setae and fewer yellow setae than others, presenting a much darker appearance.

#### KEY TO SPECIES OF *TRICHOXYS* CHEVOLAT

- 1 Pronotum black with two longitudinal yellow pubescent stripes. Elytra as in Fig. 4n. . . . . *Trichoxys vitticollis* (Laporte & Gory)
- Pronotum with mostly uniform pubescence or otherwise without pubescent stripes . . . . . 2
- 2 Light colored pubescence of elytron restricted primarily to longitudinal stripe along most or all of suture (other patches of pubescence absent or very small) . . . . . 3



- Pubescence of elytron not as above (scattered in patches or uniform throughout) . . . . . 4
- 3 Pubescent stripe present along entire length of suture to scutellum (Fig. 3d). Outer apical elytral spine strongly developed . . . . . *Trichoxys bilineatus* (Chevrolat)
- Pubescent stripe present along most of suture, but not reaching scutellum (Fig. 4i). Outer elytral apical region without spine . . . . . *Trichoxys pellitus* (White)
- 4 Basal one-third of elytron with one or more narrow, long, curved or sinuate lines of light colored pubescence . . . . . 5
- Basal one-third of elytron with uniformly light colored pubescent or with pubescence not forming curved or sinuate lines . . . . . 7
- 5 Basal one-third of elytron with only one narrow, curved light colored pubescent line of pubescence (Fig. 3g). Hind femora very long, extending beyond elytral apices. . . . . *Trichoxys longipes* Chemsak & Linsley
- Basal one-third of elytron with 2–3 alternating sinuate light colored pubescent bands. Hind femora shorter, not reaching elytral apices . . . . . 6
- 6 Apical half of elytron with two or more black bands extending from suture to lateral margins (or near) (Fig. 3b). Antennae and legs black or otherwise very dark . . . . . *Trichoxys apelles* (Newman)
- Apical half of elytron uniformly pubescent; without black bands as above (Fig. 3f). Antennae and legs light reddish brown . . . . . *Trichoxys labyrinthicus* (Chevrolat)
- 7 Base of elytron with two nearly contiguous, mostly complete, broad, transverse bands of yellowish pubescence. Elytral pubescence elsewhere usually forming large spots or partial bands. Legs very dark reddish brown to black . . . . . 8
- Base of elytron without two broad, nearly contiguous, transverse bands of pubescence. Elytron either mostly pubescent, without many distinct patches, with very small patches, or with about five vaguely defined bands. Legs light reddish brown, occasionally dark reddish brown . . . . . 10
- 8 Middlemost light colored pubescent patch of elytron transverse (not angled anteriorly towards lateral margin) (Figs. 2, 3e). . . . . *Trichoxys hirtellus* (Chevrolat)
- Middlemost light colored pubescent patch of elytron angled anteriorly towards lateral margin . . . . . 9
- 9 Light colored pubescent bands of elytra pale yellow with the black areas between them wider than each band (Fig. 4h). Pronotum broadly rounded at sides . . . . . *Trichoxys melanotelus* (White)
- Light colored pubescent bands of elytra bright yellow with the black areas between them narrower than each band (Fig. 3c). Pronotum narrowly rounded at sides . . . . . *Trichoxys atripes* (Chevrolat)
- 10 Elytron with numerous very small spots of yellow-green pubescence and having only a few (at most) larger, well defined patches. . . . . 11
- Elytron mostly covered in pubescence or with 5–12 bands or spots of pubescence separated by large areas of black integument . . . . . 12
- 11 Elytron having only a light colored sutural patch at apical one-third; remaining pubescence in pattern of very small spots or scattered clusters of setae (Fig. 4o) . . . . . *Trichoxys westwoodii* (Chevrolat)
- Elytron having 2–4 larger patches of light colored pubescence among many very small patches (Fig. 4l) . . . . . *Trichoxys sulphurifer* (Chevrolat)

- 12 Elytron mostly uniformly covered in yellowish or greenish pubescence . . . . 13  
 - Elytron mostly black with small, well separated patches of yellow pubescence . . . 14  
 13 Elytron with dark fasciae at apical half poorly defined in most specimens and not reaching suture, even if well defined. Pronotum without short, suberect, black setae interspersed among the yellowish setae (Fig. 3a) . . . .  
 . . . . . *Trichoxys abbreviatus* Bates  
 - Elytron with one or two black fasciae at apical half well defined and meeting at suture. Pronotum with numerous short, suberect, black setae interspersed among the yellowish setae (Figs. 1, 4j) . . . . . *Trichoxys penrosei* Lingafelter & Wappes  
 14 Elytron with narrow, transverse band of yellow pubescence at basal eighth. Antennae black or very dark reddish brown (Fig. 4k) . . . *Trichoxys rubripes* (White)  
 - Elytron with narrow, angulate band of yellow pubescence at base, but lacking a transverse band (Fig. 4m). Antennae light reddish brown . . . . .  
 . . . . . *Trichoxys viridicollis* (Chevrolat)

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