

Technical Report No. 58
IDENTIFYING TENEBRIONIDAE (DARKLING BEETLES)

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ABSTRACT

This report contains keys and descriptions of Tenebrionidae (darkling beetles) known to occur on the Pawnee Site. It is designed to be used in conjunction with a synoptic set in the reference collection at the site headquarters and is intended for the use of workers who are not trained taxonomists. Technical terminology is kept to a minimum. The arrangement of species in the keys is not phylogenetic, but is based on the most easily observed reliable characteristics. The descriptions are arranged in alphabetic order and emphasize comparisons with the species which are most likely to be confused with the one under consideration. Twenty-three species are recorded from the Site. Complete identification has had to be deferred in *Blapstinus* and three less important genera.

RECOGNITION

The hind tarsus has one fewer segment than the other tarsi (four segments rather than five). Local species have small, *vertically elongate* eyes, which may be narrowed at the middle, or in a few species, entirely divided by the head margin, so that there appear to be four eyes, two dorsal, and two ventral. The anterior edge of the head is thickened, and in most species virtually conceals the mandibles. The antennae are 11-segmented and are more or less thread-like, with the outer segments usually somewhat thickened. Most species are medium to large, 10-35 mm long, but there are a few minute species, some of which are very common. Many of the larger species do "handstands" when molested and may release an irritating fluid from the anus. Local species are almost entirely black. A few species regularly have a brown stripe along the elytral suture. This feature also occurs as an anomaly in some of the normally pure black species. The elytra are otherwise unpatterned. A few small species have metallic reflections. Most species forage at night and spend the day beneath dried cow dung.

OTHER FAMILIES WHICH MAY BE MISTAKEN FOR TENEBRIONIDAE

i. *Carabidae* (Ground beetles): Common in the same habitats as Tenebrionidae and easily confused with them. Recognized by having large, round eyes, antennae which are not thickened distally, five segments to all tarsi, and the anterior edge of the head not thickened.

ii. *Meloidae* (Blister beetles): With the same tarsal type as Tenebrionidae, the Meloidae always have a large head with a *narrow neck*. The eyes are usually round, and the anterior edge of the head is not thickened.

iii. *Cerambycidae* (Longhorn beetles): One genus, *Moneilema*, has an extraordinary resemblance to Tenebrionidae (especially *Eleodes*, of which it is probably a Batesian mimic). It differs in having all tarsi with the same number of segments (actually five, but the fourth segment is minute), in having the third tarsal segment conspicuously bilobed, and in lacking the thickened anterior head margin. The antennae arise more medially than in Tenebrionids, have more elongate segments, which are banded with gray in the local species, and are not enlarged distally.

PROVISIONAL KEY TO THE TENEBRIONIDAE OF THE PAWNEE SITE

- 1a. Body very broadly oval to circular (greatest width more than one-half of length). 2
- 1b. Narrower; greatest width less than one-half of total length. 3
- 2a. Dorsal surface with very long hairs; length 5-7 mm.
Edrotes spp.
- 2b. Dorsal surface not hairy; length 9-12 mm.
Eusattus spp.
- 3a. Very small species; length 6 mm or less. 4
- 3b. Larger species; length 10 mm or more. 6
- 4a. Anterior tibia broadly dilated, triangular, with a row of blunt spinose hairs on the outer margin. *Phaleria*
- 4b. Anterior tibia not dilated, scarcely wider than middle tibia. 5
- 5a. Eyes: four (each compound eye completely divided by margin of head into a dorsal eye and a ventral one); margin of head evenly curved

anterior to eyes, largely concealing mandibles.

Blapstinus spp.

- 5b. Eyes: two (eye not divided by edge of head); head abruptly narrowed anterior to eyes, so that mandibles are clearly visible in dorsal view.

Trimytis pruinosa

- 6a. Elytron with three strong ridges which are connected by irregular cross ridges; pronotum very coarsely, densely punctate; length about 22 mm.

Glyptasida sp.

- 6b. Elytra not as above, but either unridged or with more than three ridges. 7

- 7a. Sides of pronotum reflexed. 8

- 7b. Sides of pronotum not reflexed. 15

- 8a. Pronotum hexagonal, with crenulate margins; elytra with brown sutural stripe; length about 22 mm. *Gonasida elata*

- 8b. Pronotum not hexagonal not crenulate. 9

- 9a. Pronotum widest at middle, and strongly narrowed to base; elytron with complete sharp marginal carina. 10

- 9b. Pronotum with greatest width at or near base; elytral margin variable. 12

- 10a. Length 21-35 mm; elytra with brown sutural stripe.

Eleodes suturalis

- 10b. Length 13-20 mm; elytra entirely black. 11

- 11a. Elytral epipleura with distinct raised border (next to abdominal sternites) which reaches to tip of elytron.

Embaphion contusum

- 11b. Epipleura with raised border becoming indistinct posteriorly and disappearing without reaching elytral apex.

Embaphion planum

- 12a. Elytron with broadly reflexed lateral margin extending to suture; sides of pronotum very broadly reflexed.

Embaphion muricatum

- 12b. Elytron at most narrowly reflexed; sides of pronotum only narrowly reflexed. 13

- 13a. Elytron with marginal carina limited to anterior quarter; hind angles of pronotum slightly acute, but not forming triangular points.

Asidopsis polita

- 13b. Elytron with sharp marginal carina that reaches almost to suture; hind angles of pronotum forming acute projecting triangular lobes. 14

- 14a. Dorsal surface shining, with sericeous (silky) lustre.

Asidopsis tensa

- 14b. Dorsal surface opaque.

Asidopsis opaca

- 15a. Large species, 18 mm or more in length (usually over 22 mm) 16

- 15b. Medium-sized species, less than 18 mm long. 19

- 16a. Elytra deeply striate; anterior femur usually with well-developed tooth on lower margin near apex. 17

- 16b. Elytra not striate (or with faint traces of striation); no tooth on femur. 18

- 17a. Basal segment of front tarsus with hairy lobe which extends a short distance below second segment; length 25-35 mm.

Eleodes obscura

- 17b. Basal segment of front tarsus without hairy lobe, but similar to second segment; length 18-28 mm. *Eleodes hispilabris*
- 18a. Pronotum with sharp marginal rim (partly concealed in dorsal view by the convexity of the disc); line between clypeus and frons scarcely visible. *Eleodes longicollis*
- 18b. Pronotum rounded, without distinct marginal rim (marked anteriorly by row of punctures); line between clypeus and frons deeply impressed. *Euschides retusus*
- 19a. Elytron with third, fifth, seventh intervals carinate, more elevated than remaining intervals; pronotum relatively broad and flat. *Eleodes tricostata*
- 19b. Alternate intervals not elevated or carinate. 20
- 20a. Pronotum broadest at base or near to it; body outline as in diving beetles. 21
- 20b. Pronotum distinctly narrowed posteriorly. 22
- 21a. Dorsal surface glabrous; elytral punctures in rows. *Eleodes fusiformis*
- 21b. Dorsal surface with short white hairs which make it look grayish; elytral punctures not in rows; female with deep median groove on pronotum. *Bothrotes canaliculatus*
- 22a. Elytral striae well developed, with large more or less confluent punctures; intervals elevated, with large, scattered punctures; neither sex with femoral tooth; females 15-18 mm; males 12 1/2-16 mm. *Eleodes obsoleta*
- 22b. Elytral striae scarcely developed, represented by rows of punctures; intervals indistinct; male with femoral tooth; both sexes 12-15 mm. *Eleodes extricata*

SPECIES DESCRIPTIONS

1. *Asidopsis opaca*, 14-17 mm. A species with narrowly reflexed pronotal margins and acutely pointed hind angles. The elytra have a *dull surface*, and the elytral intervals are represented by low, irregular ridges. The pronotum is coarsely, densely punctate. The lateral margin of the elytron is sharply carinate for its entire length. Most similar to *A. tensa*, which differs in having a shining dorsal surface. *A. polita* is smaller, and has the elytra margined only near the humerus. *Embaphion muricatum* is somewhat similar, but has the margins of both the pronotum and elytra much more broadly and sharply reflexed. *A. opaca* is scarce. It is apparently absent until late July, when a few specimens appear.

2. *Asidopsis polita*, 12-15 mm. So far represented by one specimen found dead in a watershed in June. Probably a cold-weather species. The pronotum is distinctive: the disc is very convex and shining with fine sparse punctures, while the margin is narrowly but abruptly reflexed. The elytra have a sculpture of fine confused wrinkles. The elytral margin is carinate only near the humerus. The other species of *Asidopsis* have the elytral margin completely carinate and have more prominent posterior pronotal angles.

3. *Asidopsis tensa*, about 17 mm. Likewise represented by one dead specimen from a watershed in June, and probably a cold weather species. Very similar to *A. opaca*, but with a shining dorsal surface. The sheen is somewhat subdued, but is clearly different from the totally opaque surface of the latter species. For differences from other similar species, see *A. opaca*.

4. *Blapstinus* spp., about 4 mm. Very small, oblong-oval species, which are easily recognized by the four compound eyes. *Trimytis* is superficially similar, but is slightly larger and more robust, and has undivided eyes. *Phaleria* has eyes that are almost divided, but is easily separable by the dilated front tibiae. *Blapstinus* are very abundant on the surface of the ground where they may often be seen running. At such times they are superficially similar to the carabid *Selenophorus*. There are several species of *Blapstinus* on the site, but a key is not presently available. Lutes!

5. *Bothrotes canaliculatus*, about 10 mm. Taken in numbers on *Melilotus* by Inyamah (Technical Report No. 50), especially in July 1969. Easily recognized among medium-sized species by the apparent gray coloration, resulting from very short white hairs on a black cuticle. There is no trace of striation. The pronotum of the female is peculiarly modified, with a central furrow flanked by raised ridges.

6. *Edrotes* spp., 5-7 mm. Almost spherical beetles with a covering of very long hairs. At least two species occur on the site, but a key is not available. The only other Tenebrionids with a similar shape (*Eusattus*) are virtually hairless, and are larger.

7. *Eleodes extricata*, 12-15 mm. Scarce. Similar to the common *obsoleta*, but smaller, and with less distinct striae. Both species have marked sexual dimorphism, with the males being so much narrower than the females that they appear to belong to different species. The male of this species has a tooth on the anterior femur. It is lacking in *obsoleta*, which averages only slightly larger. The size difference is more marked in the females, those of *obsoleta* being 15-18 mm long.

8. *Eleodes fusiformis*, 12-18 mm long. Common, especially in June. Easily recognized by the oval shape, which is reminiscent of a diving beetle.

The elytra are glabrous and shining black. The striae are represented by rows of fine punctures. The legs are unusually long.

9. *Eleodes hispilabris*, 18-28 mm. Scarce in early summer, but becoming common in July and August. Taken in numbers of *Melilotus* by Inyamah (Technical Report No. 50). Apparently more prone to climb on vegetation than are the other *Eleodes*. This is a relatively large *Eleodes* with deeply striate elytra, and with the anterior femur toothed in both sexes. It is more elongate and slender than *obsoleta*, and has a much smaller pronotum with the anterior angles forming small but sharp tooth-like projections. The elytra are more flattened and are strongly narrowed anteriorly. The most similar species is *obscura*, which is usually larger (25-35 mm), and has less dentate anterior angles. The anterior tarsi will definitely separate the two species. The basal segment in *hispilabris* resembles the more distal ones in having a median ventral groove and in having scattered spinose hairs. In *obscura* the basal segment bears a hairy pad on its ventral surface.

10. *Eleodes longicollis*, 25-35 mm. A very large elongate *Eleodes* with scarcely any trace of elytral striation. All other large *Eleodes* have well developed striae. Most likely to be confused with *Euschides retusus*, which has an almost circular pronotum. In *E. longicollis* the pronotum is truncate at the base and is fitted tightly against the elytra. This species is rare, and is probably a cold weather form.

11. *Eleodes obscura*, 25-35 mm. Scarce; possibly late summer only. A very large *Eleodes* with deeply striate elytra. The male has a well-developed femoral tooth. That of the female varies from distinct, though small, to totally absent. The most similar species is *hispilabris*, which lacks the

hairy pad on the first segment of the anterior tarsus characteristic of *obscura*. The anterior angles of *obscura* are not dentiform, while the elytral intervals are less elevated than in *hispidabris* and are usually marked by fine transverse wrinkles, especially near the base and sides. Another species which might be confused with *obscura* is *Eleodes acuta*, which has a brown sutural stripe and a complete marginal carina on the elytron. It is characteristic of sand prairie and might occur in sandy parts of the Pawnee Grassland, though it has not yet been taken at the site.

12. *Eleodes obsoletus*, males 12-16 mm, females 15-18 mm. Abundant; the commonest of the larger Tenebrionidae, at least in early summer. Similar to *extricata*, but with deeper striae and coarser punctures, especially laterally. The females can be distinguished by their greater size, while the males lack the femoral tooth which is present in *extricata*. The females are so much larger and stouter than the males that they appear to be a different species. This species could also be confused with *hispidabris*. The latter species is larger and more elongate and has a femoral tooth in both sexes.

13. *Eleodes suturalis*, 21-35 mm. Scarce. A very large *Eleodes* with slightly reflexed pronotal margins and a brown sutural stripe. No other *Eleodes* has reflexed pronotal margins. *Eleodes acuta* is a species which is similar in size and coloration, but which has non-reflexed pronotal margins. It is found in sand prairies and has not been taken at the site. *Gonabida elata* is a species with reflexed pronotal margins and a brown sutural stripe. It is easily distinguished by the hexagonal pronotum with crenulate margins. *E. suturalis* is apparently rare in the grasslands and is more common in the lower foothills.

14. *Eleodes tricostata*, 14-20 mm. Scarce in the uplands; moderately common in the stream valleys and near the playa lake. Easily recognized by the costate third, fifth, and seventh elytral intervals. The pronotum is rather broad. The dorsal surface is somewhat dull. There is a general resemblance to *Asidopsis opaca*. The latter species is easily distinguished by the reflexed pronotal margins and non-costate elytra.

15. *Embaphion contusum*, 13-17 mm. Rare. One of two species which combine moderate size, uniform coloration, and a pronotum with reflexed margins and a narrowed base. In this species the inner edge of the epipleura forms a narrow raised ridge extending all the way to the apex. The elytral apices in the male are slightly expanded to form a short tail-like projection or *cauda*. In the other species, *Embaphion planum*, the inner rim of the epipleura becomes indistinct in the posterior half and fails to reach the suture. The only other species with a similar pronotum is *Eleodes suturalis*. It is much larger, has a sutural brown stripe, and has much better developed elytral striae.

16. *Embaphion muricatum*, 15-18 mm. Scarce. A grotesque and unmistakable species. The margins of both the pronotum and elytra are broadly expanded and reflexed, so that the entire dorsal surface is concave. The elytral margins are almost evenly dilated all the way to the suture. The pronotal margins are each almost as wide as the pronotal disc. The anterior angles project almost to the bases of the antennae, while the posterior angles form triangular lobes which overlap the elytra.

17. *Embaphion planum*, 12-17 mm. Rare. Extremely similar to *Embaphion contusum* (QV), but with the inner rim of the epipleura incomplete. The elytra of the male are not at all caudate.

18. *Eusattus* spp., 9-12 mm. Scarce. Very broadly oval black species. The dorsal surface is less convex than in *Edrotes*, and there are no hairs. The elytra have vague irregular wrinkles. There are probably two or more species on the site, but a key is not yet available.

19. *Euschides retusus*, about 21 mm. Rare. A large species with unstriate elytra. Likely to be confused only with *Eleodes longicollis*, but with an almost circular pronotum (the pronotum is truncate at the base in *longicollis*). In this species the legs are much shorter than in *longicollis*, the elytra are more rounded posteriorly, the pronotum is less definitely margined laterally, and the fontoclypeal line is more deeply impressed.

20. *Glyptasida* sp., 17-20 mm. Rare. Found dead in the watersheds in early spring. Easily recognizable by the form of the elytra. Each elytron has three raised longitudinal carinae. The sutures are also raised, so that the elytra together have seven ridges. The spaces between the ridges contain irregular cross-ridges, some of which connect one longitudinal ridge with another. The pronotum is very coarsely punctate, and its margins are very narrowly and indefinitely reflexed.

21. *Gonabida elata*, about 22 mm. Rare. One specimen found dead in May. Easily recognized by the hexagonal pronotum with reflexed lateral margins. The anterior angle forms a laterally projecting tooth. The remainder of the margin is vaguely crenulate. The reflexed margin is very coarsely punctate, while the center of the pronotal disc is almost smooth. The margin is sharply angulate at about the middle of its length. The elytra are narrow and convex with poorly developed striae. The odd-numbered intervals are slightly elevated (much less so than in *Eleodes tricostata*). The elytra have a brown sutural stripe. The only species which is even

superficially similar is *Eleodes suturalis*. The latter species is easily separable by the very different form of the pronotum.

22. *Phaleria* sp., about 3 mm. Rare. Found once in a DeVac sample. A minute brown species. The elytra lack true striae, but have rows of punctures. Some of the inner rows fail to reach the elytral apex. The pronotum is convex and has rounder hind angles than in *Blapstinus* or *Trimytis*. The anterior margin of the head is more dilated than in any other Tenebrionid. The eye is quite small and is almost interrupted by the head margin. The anterior tibia is very broadly triangular and is armed with spinose hairs. The general appearance suggests burrowing habits.

23. *Trimytis pruinosus*, 5-6 mm. Moderately common. A small species which looks like a large stout version of *Blapstinus*. Easily distinguished by the normal, undivided eyes, and the narrowed clypeus which exposes a part of the mandibles.

STANDARDIZED ABBREVIATIONS FOR NAMES OF TENEBRIONIDS

The following abbreviations will prevent duplications on the Data Sheets.

Ele obc	<i>Eleodes obscura</i>
Ele obl	<i>Eleodes obsoleta</i>
Eut	<i>Eusattus</i>
Ech	<i>Euschides</i>

CHECKLIST OF TENEBRIONIDAE OF THE PAWNEE SITE

1. *Asidopsis opaca* (Say)
2. *Asidopsis polita* (Say)
3. *Asidopsis tensa* Casey
4. *Blapstinus* spp.
5. *Bothrotes canaliculatus* (Say)
6. *Edrotes* spp.
7. *Eleodes extricata* (Say)
8. *Eleodes fusiformis* Leconte
9. *Eleodes hispilabris* (Say)
10. *Eleodes longicollis* Leconte
11. *Eleodes obscura* (Say)
12. *Eleodes obsoleta* (Say)
13. *Eleodes suturalis* (Say)
14. *Eleodes tricostata* (Say)
15. *Embaphion contusum* Leconte
16. *Embaphion muricatum* Say
17. *Embaphion planum* Horn
18. *Eusattus* spp.
19. *Euschides retusus* Casey
20. *Glyptasida* sp.
21. *Gonasida elata* Leconte
22. *Phalerai* spp.
23. *Trimytis pruinosus* Leconte