

Keys to the Tenebrionidae of Florida

Key to the Florida Subfamilies and Tribes [including some genera and species] of Tenebrionidae (modified from Aalbu *et al.* 2002) Based primarily on species listed in Distributional Checklist of the Beetles (Coleoptera) of Florida (Peck and Thomas 1998) (underlined terms are defined to the right) (species that key out here are pictured to the right) (size range indicated is length)

1. Tarsal claws pectinate.....
Alleculinae (Alleculini) (size range 3.5-15 mm) (**Key EE**)
1'. Tarsal claws simple.....2
- 2 (1). Tarsal formula 4-4-4, (males with seven segmented, pectinate club).....
Bolitophaginae, Bolitophagini (in part) [*Rhipidandrus* Leconte] (size range 2.0-4.0 mm) (**Key G**)
2'. Tarsal formula 5-5-4, antennae not as above.....3
3. (2') Apical antennal segment four-five times as long as preceding segments.....**Lagriinae** (in part) **Lagriini** [*Statira* Serville] (size range 8.0-12 mm) (**Key A**)
3'. Apical antennal segment not four-five times as long as preceding segments.....4
- 4 (3'). Abdomen without visible membrane along hind margin of visible sternites three and four.....**Pimeliinae** (size range 7.0-15 mm) (**Key C**)
4'. Abdomen with visible membrane along hind margin of visible sternites three and four.....5
- 5 (4'). Meso- and metatibiae bearing longitudinal, finely crenulate carina on outer (dorsal) margin; eyes usually more prominent than sides of frons, usually rounded, feebly or not emarginated.....**Diaperinae, Diaperini** (size range 3.0-8.0 mm) (**Key H**)
5'. Meso- and metatibiae lacking carina on outer margin; eyes less prominent than sides of frons, more or less transverse, always emarginated in front.....6
- 6 (5'). Seventh abdominal tergite at least partially exposed as pygidium; mesocoxal cavities closed laterally by sterna, fore tibiae usually with serrate outer (dorsal) margins.....7
6'. Seventh abdominal tergite concealed by elytra; mesocoxal cavities with epimeron separating meso and metasterna; fore tibiae with nonserrate outer (dorsal) margins.....8

General Tenebrionid Characters:

- typically 11-segmented antennae
- antennae inserted under lateral expansion of frons
- tarsal formula 5-5-4
- closed procoxal cavities

Carina-an elevated ridge or keel, not necessarily high or acute

Crenulate-having the margin finely notched with small, round teeth

Emarginated-Cut out place along margin

Elytra-the forewings of beetles

Epimeron-the posterior division of a thoracic pleuron (the portions above, before and behind the coxa)

Frons-the upper anterior portion of the head capsule, usually a distinct sclerite (any plate of the body wall) between the epicranium (upper part of the head) and clypeus (part of head below the frons)

Nonserrate-not with notched edges like teeth of a saw

Pectinate-with even processes like the teeth of a comb

Pygidium-the tergum (upper or dorsal surface of body segment) of the last visible segment of the abdomen

Sternites-subdivisions of the sternum (ventral segmentation)

Tergite-dorsal sclerite or part of segment

Transverse-running across

Key to the Tenebrionid Subfamilies and Tribes of Florida

7 (6). Body elongate, cylindrical; elytra truncate, pygidium completely exposed; antennae short, flattened, clavate, without placoid sensilla.....**Hypophloeinae, Hypophloeini, [Corticeus** Piller and Mitterpacher] (size range 2.0-5.0 mm) (**Key O**)

7'. Body oblong, oval, convex; elytra abbreviated, seventh abdominal tergite partially exposed as pygidium; antennae slender, moniliform, bearing large placoid sensilla, often appearing as large white scales at apex of segments nine and ten.....**Tenebrioninae** (in part), **Ulomini** (size range 7.0-12 mm) (**Key S**)

8 (6'). First segment of tarsi short, tarsi compressed; genae sulcate, antennae with segments five to seven sometimes pectinate.....**Bolitophaginae, Bolitophagini** (size range 5.0-13 mm) (in part) (**Key F**)

8'. First segment of tarsi moderate or elongate, never very short, not compressed; genae not sulcate.....9

9 (8'). All tibiae more or less expanded apically, fossorial...10

9'. Protibiae only, or none of the tibiae, expanded apically...11

10 (9). Antennae moderately long, gradually broadened apically.....**Diaperinae** (in part), **Phalerini, [Phaleria** Latreille] (size range 6.0-8.0 mm) (**Key E**)

10'. Antennae short, apical four segments abruptly dilated.....**Diaperinae** (in part), **Trachyscelini, [Trachyscelis aphodiodes** Latreille] (Fig. 1) (size ~3.0 mm)

11 (9'). Penultimate segment of tarsi weakly to strongly bilobed.....**Lagriinae** (in part), **Goniaderini** (size range 2.0-6.0 mm) (**Key B**)

11'. Penultimate segment of tarsi simple.....12

12. (11') Procoxae subtransverse; mesocoxae with trochantin hidden; third segment of antennae short.....13

12'. Procoxae rounded; mesocoxae with trochantin visible; antennae with third segment usually longer than following segments.....14

13 (12). Scutellum small; elytra without scutellar striae; anterior striae non-parallel.....**Phrenapatinae, Penetini, [Dioedus punctatus** LeConte] (Fig. 2) (size range 2.5-3.5 mm)

13'. Scutellum large; elytra with scutellar striae; anterior striae parallel.....**Tenebrioninae** (in part), **Triboliini** (size range 3.0-4.0 mm) (**Key V**)

14 (12'). Antennae with compound, stellate sensorial (visible at 50x or higher, at lower power appearing as minute circular white pits) on at least apical three segments.....15

14'. Antennae with simple, setiform sensilla.....21

Clavate-thickening gradually toward the tip

Elytra-the forewings of beetles

Fossorial-formed for the habit of digging or burrowing

Genae-part of the cranium of each side of the eye

Moniliform-beaded like a necklace

Pectinate-with even processes like the teeth of a comb

Placoid sensilla-platelike setae/organ

Pygidium-the tergum (upper or dorsal surface of body segment) of the last visible segment of the abdomen

Sulcate-deeply furrowed or grooved



Fig. 1: *T. aphodiodes* **Fig. 2:** *D. punctatus*

Dilated-widened or expanded

Penultimate-next to last

Repose-at rest

Scutellum-triangular piece at base between the elytra

Stellate-star-shaped

Striae-longitudinal depressed lines or furrows, frequently punctured

Trochantin-free sclerotized remnant of coxopleurite located at base of leg, providing second point of articulation with coxa

15 (14). Head vertical in repose, nearly encompassed within pronotum; eyes very large, embracing antennal insertion in genae; epistoma with clypeolabral suture membrane clearly exposed.....**Tenebrioninae** (in part), **Amarygmini** (size range 9.0-15 mm) (**Key CC**)

15'. Head normal, subhorizontal in repose; eyes variable; epistomal with clypeolabral membrane exposed or not.....16

16 (15'). Antennae with compound, stellate sensoria on at least apical five segments.....17

16'. Antennae with compound, stellate sensoria on apical three or four segments only.....**Tenebrioninae** (in part), **Tenebrionini** (size range 6.0-30 mm) (**Key AA**)

17 (16). Antennae with compound, stellate sensoria on apical five or six segments.....18

17'. Antennae with compound, stellate sensoria on apical seven or eight segments.....20

18 (17). Ventral surface of basal three or four tarsomeres covered by pads of dense, usually yellow pubescence; ventral surface of tarsomeres usually flattened; head and eyes variable.....19

18'. Ventral surface of basal three tarsomeres covered by usually stiff, dark colored setae, tarsomeres cylindrical; head widest anterior to eyes; eyes small, separated ventrally by distance greater than three times width of eye.....
..... **Tenebrioninae** (in part), **Alphitobiini**, [*Alphitobius* Stephens] (size range 4.5-6.5 mm) (**Key Z**)

19 (18). Fourth tarsomere much smaller than third, bearing a few long, ventral setae; body form cylindrical; epistoma with clypeolabral membrane clearly exposed.....**Coelometopinae** (in part), **Talanini**, [*Talanus* Mäklin] (size range 4.0-8.0 mm) (**Key NN**)

19'. Tarsomeres three and four subequal, each usually with pad of dense, yellowish pubescence; body form variable; epistoma with clypeolabral membrane exposed or not.....
Tenebrioninae (in part), **Centronopini** (size range 13-16 mm) and **Coelometopinae** (in part), **Coelometopini** (size range 7.0-24 mm) (**Key II**)

20 (17'). Prosternal process declivous, flattened behind coxae; broadly rounded or truncate; mesosternal fossa very broad, shallow; epistoma with clypeolabral membrane clearly exposed.....**Coelometopinae** (in part), **Strongyliini**, [*Strongylium* Kirby] (size range 11-15 mm) (**Key OO**)

20'. Prosternal process prominent, horizontal behind coxae; sharply acute and received in deep mesosternal fossa; epistoma with clypeolabral membrane exposed or not.....**Tenebrioninae** (in part), **Centronopini**

Clypeolabral-pertaining to the clypeus (part of the head below the frons) and the labrum

Declivous-sloping downward

Epistoma-oral margin or sclerite behind the labrum (upper lip)

Fossa-a pit

Genae-part of the cranium of each side of the eye

Prosternal process-posterior prolongation of prosternum behind forecoxae

Stellate sensoria-star-shaped sensory organs

Tarsomeres-subdivisions of the tarsus

(size range 13-16 mm) and **Coelometopinae** (in part), **Coelometopini** (size range 7.0-24 mm) (**Key II**)

21 (14'). Eyes vertically elongate, subparallel, strongly inflated; epistoma with clypeolabral membrane clearly exposed....**Tenebrioninae** (in part), **Helopini**, (size range 9.0-13 mm) (**Key U**)

21'. Eyes variable, not vertically elongate, subparallel or strongly inflated; epistoma with clypeolabral membrane rarely exposed.....22

22 (21'). Mesocoxae transverse, never oblique....**Opatrinae** (size range 3.0-30 mm) (**Key P**)

22'. Mesocoxae oblique; tarsi spinous; epistoma with clypeolabral membrane not exposed.....

Diaperinae (in part), **Crypticini** (size range 2.0-4.0 mm) (**Key N**)

Clypeolabral-pertaining to the clypeus (part of the head below the frons) and the labrum

Epistoma-oral margin or sclerite behind the labrum (upper lip)

Oblique-slanting

Spinous-armed with spines

Comparisons of shape and approximate actual size of tenebrionid subfamilies and some representative taxa known in Florida

