

A Literature-based Dichotomous Key for the Identification of the Cockroach fauna (Insecta: Blattodea) of Florida

Insect Classification Exercise

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Abstract: Students used available literature and specimens to produce a dichotomous key to species of cockroaches recorded from Florida. This exercise introduced students to techniques used in studying a group of insects, in this case Blattodea, to produce a regional species key. Producing a guide to a group of insects as a class exercise has proven useful both as a teaching tool and as a method to generate information for the public.

Key Words: Blattodea Florida, *Blatta*, *Eurycotis*, *Periplaneta*, *Arenivaga*, *Compsodes*, *Holocompsa*, *Myrmecoblatta*, *Blattella*, *Cariblatta*, *Chorisoneura*, *Euthlastoblatta*, *Ischnoptera*, *Latiblatta*, *Neoblattella*, *Parcoblatta*, *Plectoptera*, *Supella*, *Symploce*, *Blaberus*, *Epilampra*, *Hemiblamera*, *Nauphoeta*, *Panchlora*, *Phoetalia*, *Pycnoscelis*, *Rhyparobia*, distributions, systematics, education, teaching, techniques.

Identification of cockroaches is limited here to **adults**. A major source of confusion is the recognition of adults from nymphs (**Figs. 1, 2**). There are subjective differences, as well as morphological differences. Immature cockroaches are known as **nymphs**. Nymphs closely resemble adults except nymphs are generally smaller and lack wings and genital openings or copulatory appendages at the tip of their abdomen. Many species, however, have wingless adult females. Nymphs of these may be recognized by their shorter, relatively broad cerci and lack of external genitalia. Male cockroaches possess styli in addition to paired cerci. Styli arise from the subgenital plate and are generally conspicuous, but may also be reduced in some species. Styli are absent in adult females and nymphs.

As keys were modified to include / restrict genera to Florida it became apparent that certain neotropical genera would have to be included; *Epilampra*, *Neoblattella*, and *Rhyparobia*. The latter genus has not been found in Florida but its distribution makes it a likely candidate to be found here (Atkinson et. al, 1991). The other two genera have been recorded from Florida and are known to have established populations in extreme southern Florida.

Published keys were used whenever possible. Photo credits are given with pictures.



Fig. 1. Adult Australian cockroach, *Periplaneta australasiae* (F.); Blattodea, Blattellidae). Photo by J. Castner.

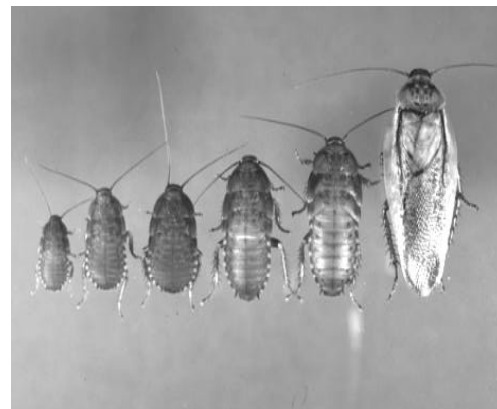


Fig. 2. Nymphs and adult of "Lobster" cockroach *Nauphoeta cinerea* (Olivier). Photo by J. Castner.

Project coordinator: P. M. Choate

Student Contributors: (First class ENY 4161/6166; S. Burns, L. Olsen, D. Richman, O. Pérez, M. Patnaude, C. McFarland, K. McManamy, and R. Pluke. Subsequent classes have tested and modified portions of this document.)

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Key to Genera of Florida Blattodea

(modified from several sources)

1. Ventral margins of femora supplied with numerous spines 2
 - Ventral margins of femora unarmed, with only a few distal spines, or only posterior femora armed with spines 15
- 2(1). Ventro-anterior margin of anterior femora with rows of spines that either decrease gradually in size and length toward apex or are of nearly equal length throughout 3
 - Ventro-anterior margin of anterior femora with row of heavy basal spines followed by row of more slender, shorter apical spines 10
- 3(2). Front wings reduced or not; if latter, then with longitudinal discoidal(cubital) sections extending to apex of front wings 4
 - Front wings not reduced, with discoidal (cubital) sections oblique and extending to hind margin of front wings (Figs. 3, 4) ***Supella longipalpa* (Fabricius)**
- 4(3).Ventro-anterior margin of front femora with 2 heavy apical spines 5
 - Ventro-anterior margin of front femora with 3 heavy apical spines 7
- 5(4). Front wing much reduced; body above blackish with numerous light yellowish markings (Fig. 2) ***Nauphoeta cinerea* (Olivier)**
 - Front wings reduced or not, but body above without this color 6
- 6(5). Hind wings with costal veins strongly clubbed apically ***Cariblatta lutea* ssp.**
 - Hind wings with costal veins normal, not clubbed apically ***Symphloe* (2 spp; *pallens* & *morsei*)**
- 7(4). Male with subgenital plate symmetrical; styles elongate, straight, slender symmetrical processes; female with subgenital plate valvate 8
 - Male with subgenital plate strongly asymmetrical; styles relatively short and heavy, symmetrical or not; female with subgenital plate simple, not valvate (Fig. 5) ***Blattella***
- 8(7). Terminal pads between claw (arolia) present; size medium to large (>24mm) 9
 - Terminal pad between claw absent; size medium (<24mm) (Fig. 6) ***Blatta orientalis* L.**
- 9(8). Front wing represented by subquadrate pads, with inner (sutural) margins weakly overlapping (Fig. 7) ***Eurycotis* (key to species)**



Fig. 3. *Supella longipalpa* (F.) female (note short wings). Photo by J. Castner.



Fig. 4. *Supella longipalpa* (F.) male (note long wings). Photo by J. Castner.



Fig. 5. *Blattella vaga* Hebard. Photo by J. Castner.



Fig. 6. The Oriental roach - *Blatta orientalis* L. Photo by J. Castner.



Fig. 7. The Florida woods roach *Eurycotis floridana* (Walker). Photo by J. Castner.

- Front and hind wings fully developed, extending beyond apex of abdomen (**Fig. 8**)
 **Periplaneta** (key to species)

- 10(2). Four basal tarsomeres, each with a ventral pad (see plates 1, 3, 5) 11
- Fourth tarsomere only with a ventral pad 14

- 11(10).Ventro-anterior margin of front femora with 3 apical spines 12
- Ventro-apical margin of front femora with only 1 apical spine **Phoetalia pallida** (Brunner)

- 12(11). Tarsal claws symmetrical 13
- Tarsal claws strongly asymmetrical
 **Latiblattella rehni** Hebard

- 13(12). Male with 6th dorsal abdominal segment bearing toward the middle, at specialization of 6th and 7th segments, 2 minute, chitinous projections armed dorso-median with elongate delicate teeth; styles of subgenital plate not flexed, of very unequal bulk; female with general color solid, shining blackish brown, legs yellowish orange
 **Ischnoptera deropeltiformis** (Brunner)
- Male with dorsal surface of abdomen either specialized or not but never showing armed projections or character of specialization just mentioned; styles of subgenital plate slender, deflexed, cylindrical processes, with rounded apices, right slightly longer; female with general color never solid, shining blackish brown with legs yellowish orange
 **Parcoblatta** (key to species)

- 14(10). Front wings fully developed (male), considerably reduced but not truncate (female); pronotum shining blackish brown, margined laterally and anteriorly with buff **Euthlastoblatta**
- Front wings considerably reduced; truncate, in both sexes; pronotum buffy, disk sub-marginally bordered, rather narrowly, with blackish brown and median anchor-shaped marking (**Fig. 9**)
 **Euthlastoblatta gemma** Hebard

- 15(1). Front and hind wings not reduced, anal section of hind wings folding fanwise; general surface hairless 16
- Front and hind wings reduced or not; some species with wings completely absent, but if hind wings present, anal field not folded fanwise; general surface hairy 22

- 16(15). Fourth tarsomere only with a ventral pad; hind wings with an an interclaated triangle or appendicular field 17
- Four basal tarsomeres each with a ventral pad; wings without an intercalated triangle or appendicular field 19



Fig. 8. The American cockroach *Periplaneta americana* (L.). Photo by J. Castner.



Fig. 9. *Euthlastoblatta gemma* Hebard

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- 17(16). Front femur with 3 spines on ventral margin and 2 spines at the tip **Ectobius (=Symploce)**
 - Front femur with a single elongate apical spine 18
- 18(17). Tarsal claws single but asymmetrical; hind wing with an intercalated triangle of length equal to not more than one-third total wing length
Chorisoneura (2 spp., *parishi* Rehn (Dade Co., & *texensis* Saussure & Zehntner)
 - Tarsal claws equal but with 2 microscopic teeth on each internal margin; hind wing with a reflexed appendicular field of length equal to approximately one half total wing length
 **Plectoptera poeyi** (Saussure)
- 19(16). Pad between claws present; size medium (under 30mm); pronotum produced posteriorly obtuse-angulate, apex rounded 20
 - Pad between claws absent; size extremely large (over 40mm); pronotum subelliptical (**Fig. 10**)
 **Blaberus** (key to species)
- 20(19). General color brown 21
 - General color light Paris green; front wings not pitted (**Fig. 11**) **Panchlora nivea** (L.)
- 21(20). Front wing light brown; pronotum dark brown, pale in front; basal fourth of front wing with numerous small round pits, many in double rows; front femur bordered with stiff hairs and single stout spine at base (**Fig. 12**)
 **Pycnoscelus surinamensis** (L.)
 - Pronotum and front wing pale brownish; pronotum with dark central blotch, with intricate pale markings, and a dark band at each side; basal third of discoidal vein of hind wing pigmented brown
 **Nauphoeta cinerea** (Olivier)
- 22(15). Tarsomeres with pads 23
 - Tarsomeres without pads 24
- 23(22). Front wings not reaching to middle of abdomen; pad between claws absent; size large (over 30mm) **Hemiblabera tenebricosa** Rehn & Hebard
 - Front and hind wings extending beyond apex of abdomen; pad present between claws; size smaller (under 7mm) **Holocompsa nitidula** (F.)
- 24(22). Size 3mm or less; cerci stout, segmentation poorly indicated but present; arolia absent; labrum spadelike, longer than broad; frequents ant nests (**Camponotus**) (**Fig. 13**)
 **Myrmecoblatta wheeleri** Hebard
 - Size variable but always much larger than above;
 25



Fig. 10. *Blaberus craniifer* Burmeister. Photo by J. Castner.



Fig. 11. Cuban cockroach *Panchlora nivea* (L.). Photo by J. Castner.



Fig. 12. Surinam cockroach *Pycnoscelus surinamensis* (L.). Photo by J. Castner.

- 25(24). Ocelli absent; male with styles of subgenital plate small; female without transverse clypeal swelling; subgenital plate valvular
 **Compsodes** (2 spp., *cucullatus* & *schwarzzi*)
 - Ocelli large (male) or ocellar spots present, usually weakly defined (female); male with styles absent from subgenital plate; female with transverse clypeal swelling; subgenital plate simple (Fig. 13a., 13b) **Arenivaga floridensis** Caudell

Species of **Plectoptera** in Florida
 (modified from Nickle and Gurney, 1985)

1. Glossy, uniformly translucent yellowish species
 **Plectoptera poeyi** Saussure
 - Silvery-gray, with overlying reddish mottled pattern on tegmina; pronotum dark reddish brown or black with irregular white or buff border; head and body dark brown; distinctive buff colored band extending across face from eyes to midpoint of antennal sockets
 **Plectoptera picta** Saussure and Zehntner

Species of **Periplaneta** found in Florida

1. Color above shining blackish brown; length 24-33mm
 **P. fuliginosa** (Serville)
 - Color not as above; pronotum with distinct to vague pronotal markings 2
 2(1). Tegmina with conspicuous lateral pale basal stripe; pronotum with sharply contrasting, pale or yellow margin; length 23-29mm **P. australasiae** (F.)
 - Tegmina entirely reddish brown; pronotum with less defined markings 3
 3(2). Distal segment of cercus elongated, length more than twice width; male with caudal tergite deeply notched; distal portion of plate thin, projecting as hood over corresponding terminal sternite; median segment unspecialized **P. americana** (L.)
 - Distal segment of cercus triangular; less than twice width; male with caudal tergite only slightly notched; distal portion opaque; median segment specialized, consisting of a shallow channel having a tuft of hairs; 25-33mm
 **P. brunnea** Burmeister

Species of **Blaberus** found in Florida

1. Overall color brownish; pronotum dull yellow with a central black-brown marking having lighter central area suggesting a smiling human face; 40-60mm
 **B. craniifer** Burmeister
 - Overall color yellowish; tegmina with central brown blotch; pronotum dull yellow with clearly defined,

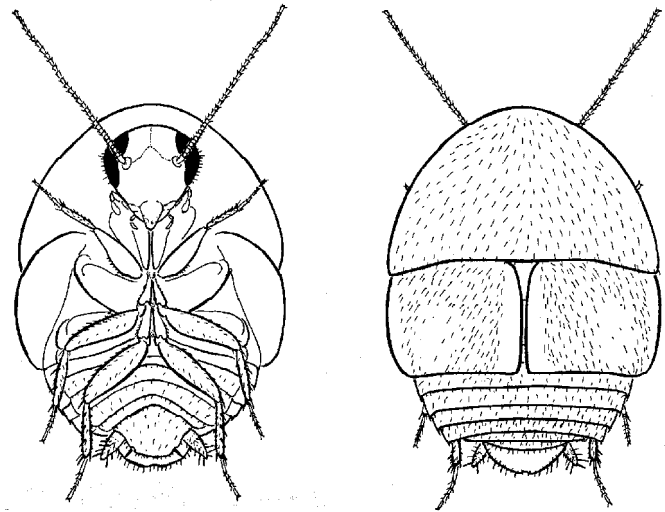


Fig. 13. *Myrmecoblatta wheeleri* (modified from Deyrup and Fisk, 1984.)



Fig. 13a. *Arenivaga floridensis* male (Photo P. M. Choate)



Fig. 13b. *Arenivaga floridensis* female (Photo P. M. Choate)

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shield-shaped black-brown central area; 50-80mm
 **B. discoidalis** Serville

Species of **Eurycotis** found in Florida
 (modified from Gurney, 1959)

1. Tegmina very broad, subquadrate; overall color brownish; pulvillus of hind tarsus one-third to $\frac{1}{2}$ ventral length of basal segment; basal segment of hind tarsus less elongate **E. floridana** (Walker)
- Tegmina lateral, subtriangular; overall color black; basal segment of hind tarsus more elongate; pulvillus of basal segment of hind tarsus about $\frac{1}{4}$ ventral length of segment **E. lixa** Rehn

Species of **Parcoblatta** found in Florida
 (modified from Blatchley, 1920)

1. Female with inner wings absent and tegmina represented by very small oblong pads, separated by more than twice their width; male with dorsal segments of abdomen unmodified; head and pronotal disk shining blackish-brown
 **P. bolliana** (Saussure & Zehntner)
- Female with inner wings present, often very short, and tegmina not as above; male with one or more dorsal segments modified 2
- 2(1). Tegmina of female strongly abbreviated, covering not more than $\frac{1}{2}$ the abdomen; males with disc of pronotum not distinctly darker than sides and nearly uniform in color with tegmina 3
- Tegmina of female much less abbreviated, reaching beyond middle of abdomen, their tips never truncate; those of male delicate in structure and fully developed 6
- 3(2). Females shining blackish brown, their tegmina subtriangular, separated by a space equal to $\frac{1}{4}$ their width, their hind margins oblique; males pale brownish-yellow, their tegmina much wider than pronotum, their supra-anal plate only twice as broad as long, its apex broadly rounded; median dorsal abdominal segment of male with 2 raised ridges at middle, each bearing on basal portion a heavy tuft of hairs **P. uhleriana** (Saussure)
- Females reddish brown or brownish-yellow, the abdomen often darker, their tegmina subquadrate, slightly overlapping; males almost uniform brownish yellow in hue 4
- 4(3). Length of male body 17.5-21.5mm, of tegmina 17.8-22mm; females with hind margins of tegmina broadly rounded; middle of median and first dorsal abdominal segments of male each with 2 feeble elevations convergent in front and supplied with a heavy tuft of hairs **P. lata** (Brunner)

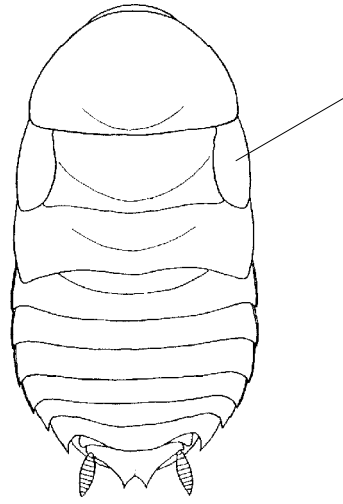


Fig.14. **Eurycotis lixa** Rehn (note shape of tegmina).

- Length of male body not over 16.5mm, of tegmina not over 17mm; females with tegmina covering only basal third of abdomen, their hind margins almost squarely truncate; tegmina of male but slightly wider than pronotum 5
- 5(4). Smaller and more slender, average size of pronotum of female 3.5X4.4mm; male with a large area at middle of median dorsal abdominal segment supplied with minute scattered hairs and with supra-anal plate 4 times as broad as long, squarely truncate; pronotum of male elliptical, widest at middle, not distinctly narrowed in front; average length of male body 13mm, of tegmina 15mm
 **P. virginica** (Brunner)
- Larger and broader, average of pronotum of female, 4X5.6mm; modified abdominal segment of male much as in uhleriana; pronotum of male longer, more narrowed in front, widest slightly behind the middle; average length of body of male 14.6mm; of tegmina 15.7mm
 **P. fulvescens** (Saussure & Zehntner)
- 6(2). Larger, average size of pronotum of female 5X6.1mm; median and first dorsal abdominal segments of male each concave at base, the concavity overhung with 2 elevations which are heavily supplied with hairs on the under surface; average length male body 20.7mm, tegmina 21.2mm
 **P. pennsylvanica** (DeGeer)
- Smaller, average of pronotum of female 4.3X5.6mm, its sides less strikingly pale; median dorsal abdominal segment of male alone modified as in pennsylvanica; average length of male body 16.6mm, of

tegmina 18.6mm
 **P. divisa** (Saussure & Zehntner)

Florida **Blattella** species
 (modified from Mizukubo 1981)

B. vaga Hebard - differs from both German and Asian by its black face (light colored in other two). Otherwise superficially similar.

B. germanica - pronotal stripes simple, slightly more broadly separated by their widths. Male interocular distance scarcely 3/4 times as long as distance between antennal sockets; lateral submarginal area of tergite VII immaculate; apical margin of tergite VIII shallowly notched in the middle; left stylus armed with 5-6 thorns; genitalia with R21 less than 4/5 times as long as R3; recurved portion of L3 elongate; female with interocular distance more than 4/5 times as wide as distance between antennal sockets; apical margin of subgenital plate subsinuous distally.

B. asahinai - pronotal stripes paler, irregularly shaped and rather irregularly separated from each other; male with interocular distance decidedly narrower, 1/2 to 3/5 the distance between antennal sockets; lateral submarginal area of tergite VII weakly marked basally with brownish blotches; apical margin of tergite VIII more deeply notched in the middle; left stylus armed with 2-3 thorns; genitalia with R21 nearly as large as R3; recurved portion of L3 shortened. Female with interocular distance less than 4/5 times as wide as distance between antennal sockets; apical margin of subgenital plate without sinuation distally. Note: this species is quick to take flight, frequenting vegetation outdoors.

Comments: In general *B. asahinai* individuals are lighter colored than *B. germanica*. Both sexes of *B. asahinai* have longer wings than *B. germanica*. Wings of female *B. asahinai* are long enough to cover their oothecae.

Selected References

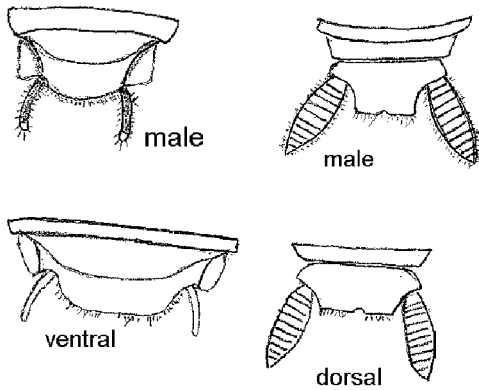
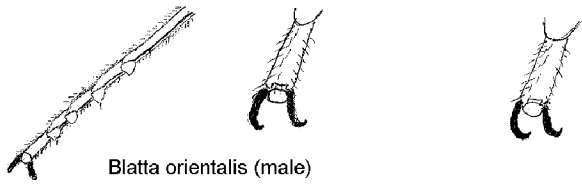
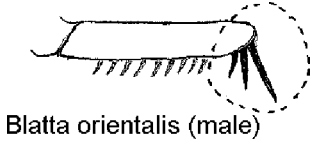
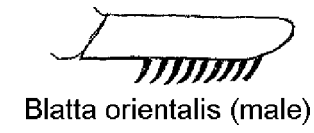
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Blatta orientalis (male)

Plate 1. *Blatta orientalis* male. Illustrations by Clint McFarland.

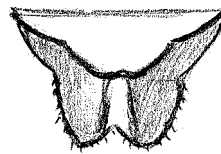
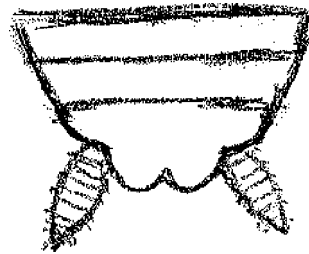
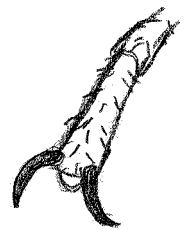
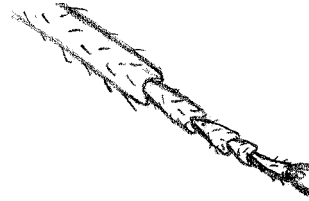
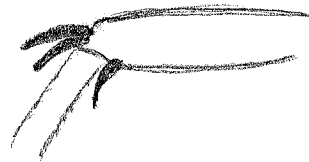


Plate 2. *Blatta orientalis* female. Illustrations by Kim McManamy

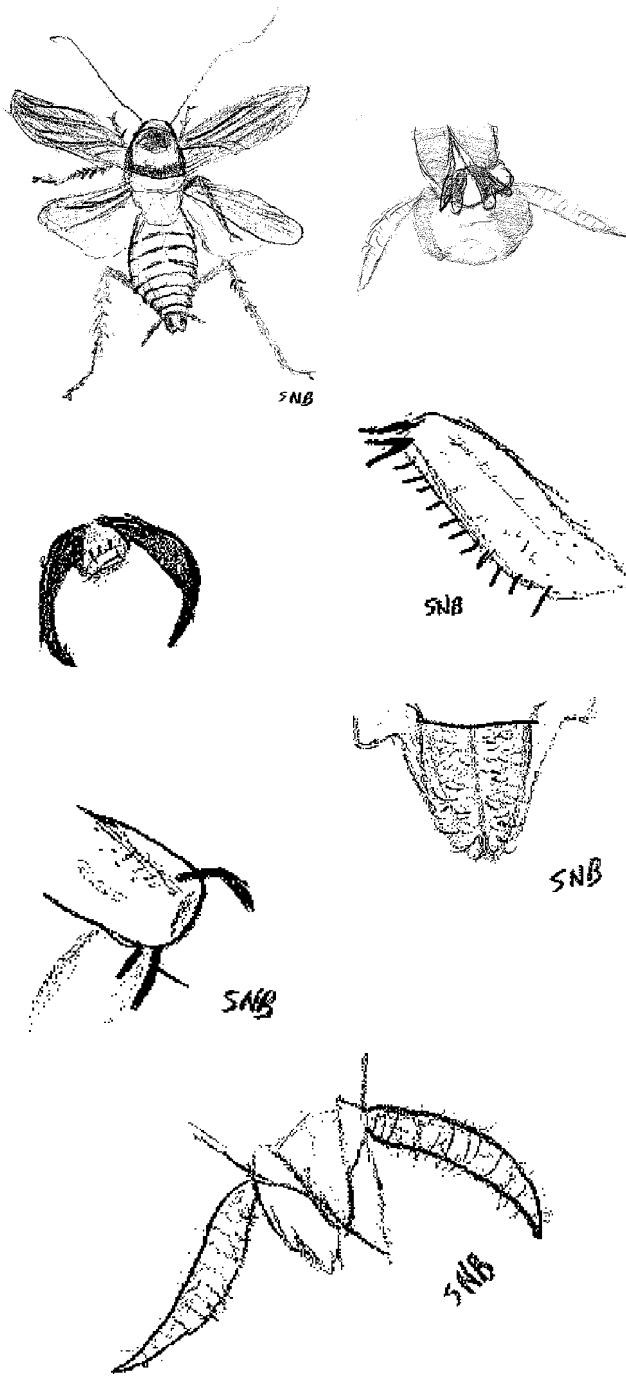


Plate 3. *Periplaneta americana* female. Illustrations by Shunt-
ele Burns.

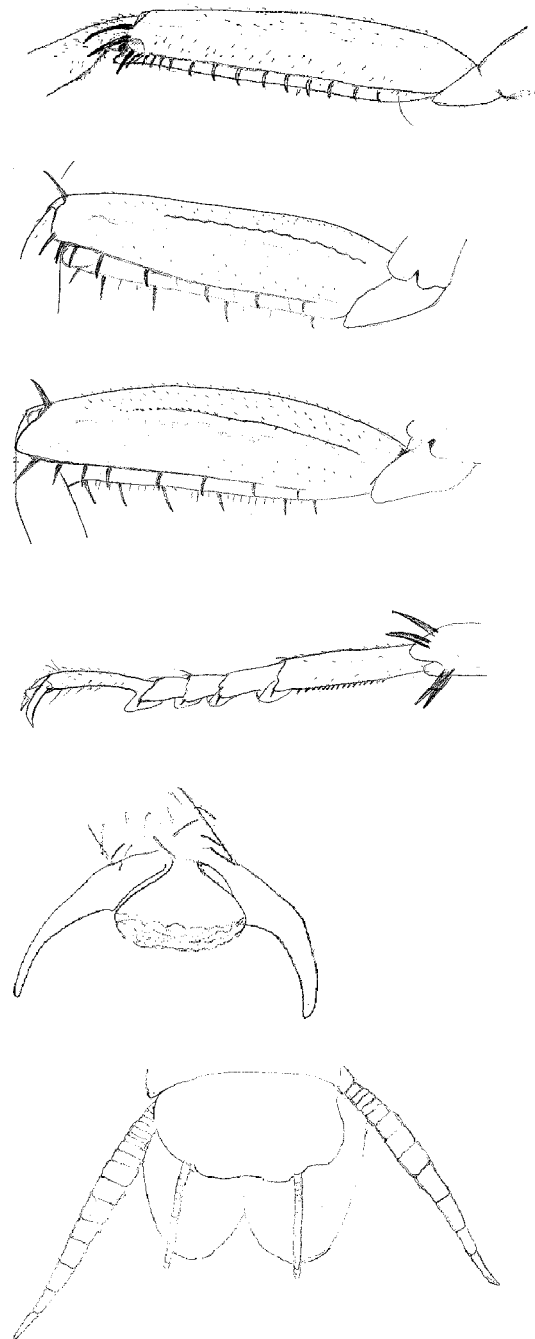


Plate 4. *Periplaneta americana* male. Illustrations by Rich-
ard Pluke.

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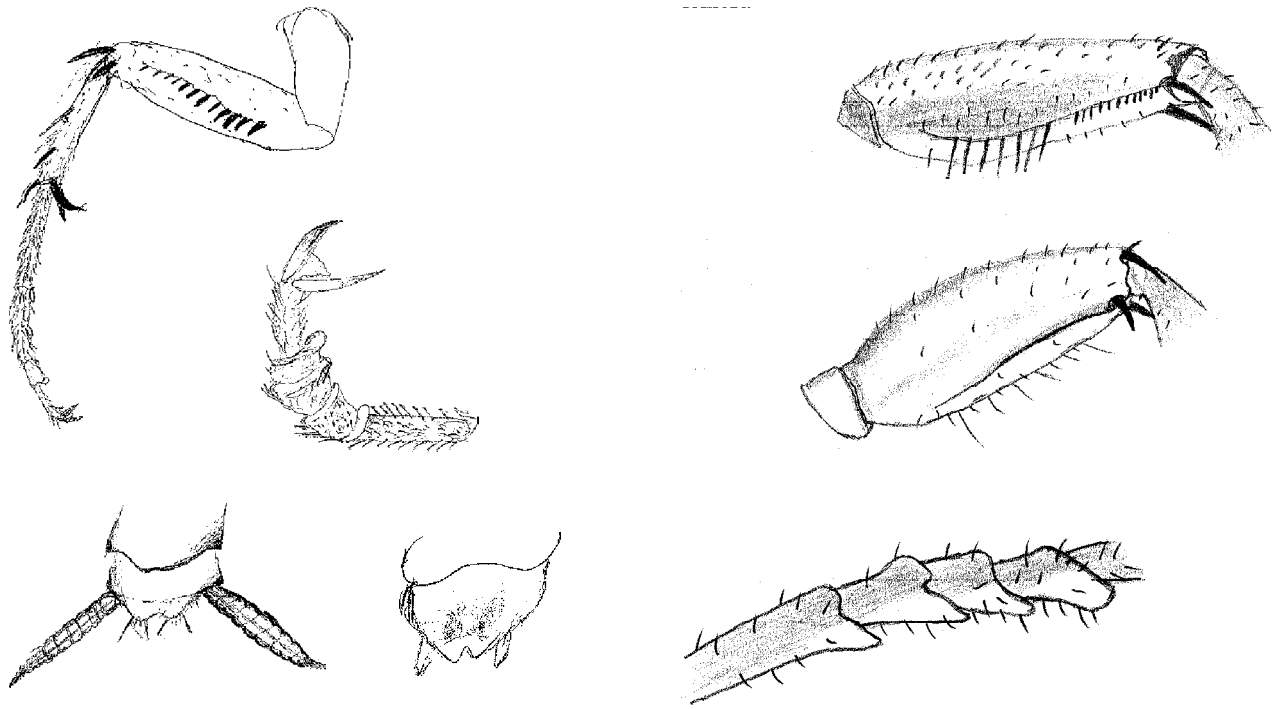


Plate 5. *Supella longipalpa* male. Illustrations by Mike Patnaude.

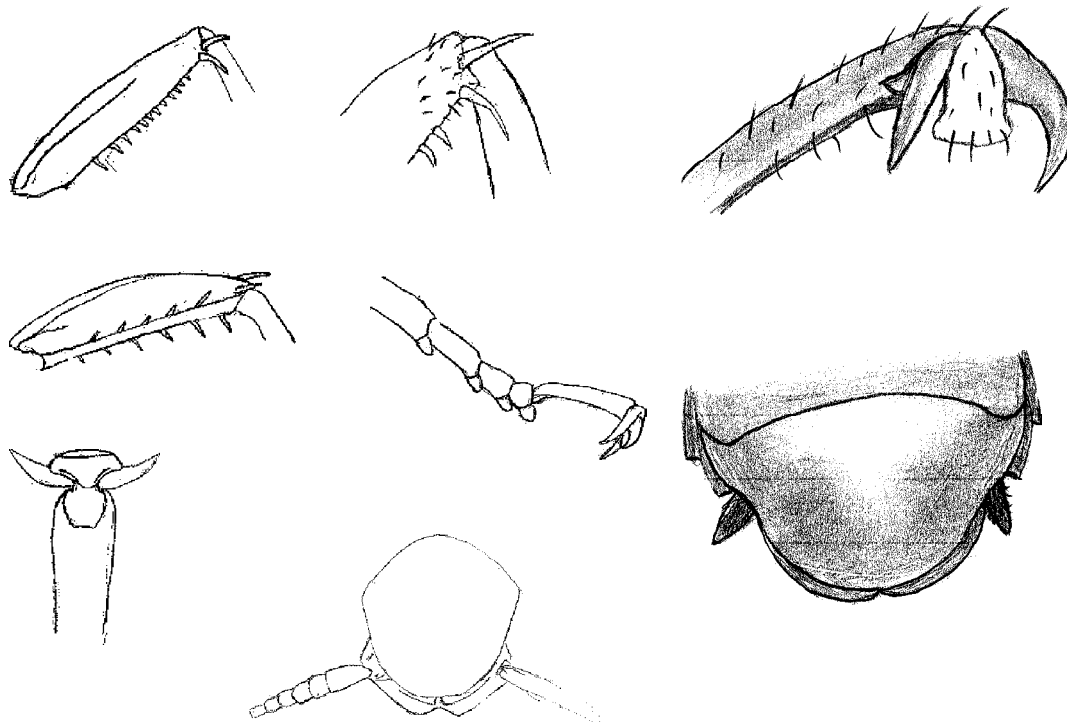


Plate 6. *Supella longipalpa* female. Illustrations by Lisa Olsen.

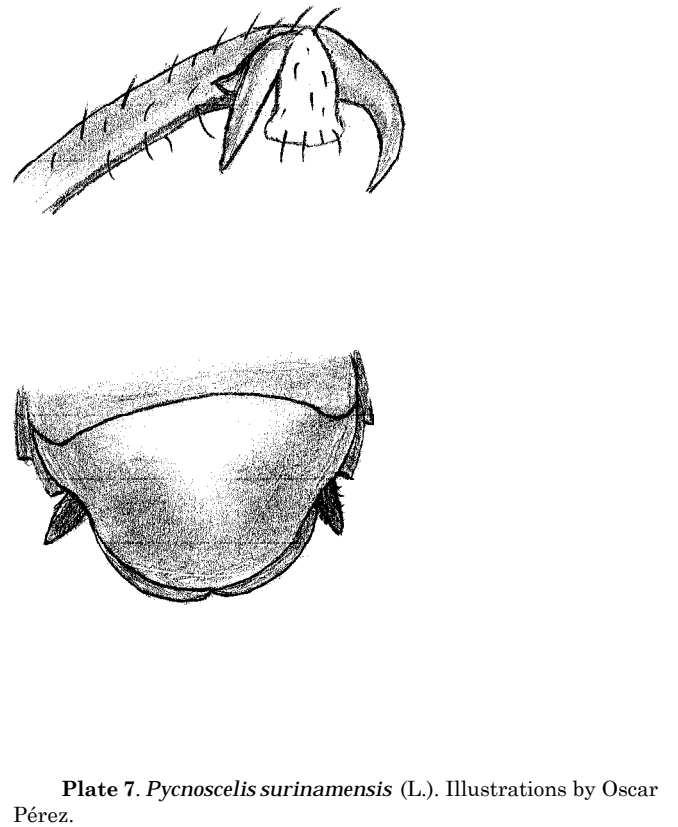


Plate 7. *Pycnoscelis surinamensis* (L.). Illustrations by Oscar Pérez.



male



female

Plate 8. Adult Cuban cockroach *Panchlora nivea* L. Illustrations by Dina Richman.

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