Key to All Sixty-Four Species of Pachybrachis Chevrolat (Coleoptera: Chrysomelidae: Cryptocephalinae) in the Eastern USA

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Source: The Coleopterists Bulletin, 73(1) : 85-96
Published By: The Coleopterists Society
URL: https://doi.org/10.1649/0010-065X-73.1.85
KEY TO ALL SIXTY-FOUR SPECIES OF *PACHYBRACHIS* CHEVROLAT
(COLEOPTERA: CHRYSOMELIDAE: CRYPTOCEPHALINAE) IN THE EASTERN USA

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ABSTRACT

A key to the males of all 64 species of *Pachybrachis* Chevrolat, 1836 (Coleoptera: Chrysomelidae: Cryptocephalinae) currently known from the eastern USA is presented. Type, figure, and map citations from the literature are given for each species. *Pachybrachis newmani* Jacobson is reported as a replacement name for *Pachybrachis limbatus* Newman, which was a homonym, thus making *Pachybrachis discoideus* Bowditch a synonym (new status).

Key Words: Nearctic, leaf beetles, taxonomy, plant association

During the course of my extensive review of the *Pachybrachis* Chevrolat, 1836 (Coleoptera: Chrysomelidae: Cryptocephalinae) of the eastern USA (defined as occurring in at least one state east of the Mississippi River), 24 new species were described (Riley and Barney 2015; Barney 2016a, b, 2017a, b, 2018a, b, 2019), and many neotypes, lectotypes, and synonymies were designated for existing species.

In Henry C. Fall’s (1915) classic revision of *Pachybrachis* in North America, he cited over 50 species occurring in the eastern USA. My previous eight papers in this series addressed all but three of those species: *Pachybrachis bivittatus* (Say); *Pachybrachis hepaticus* (F. E. Melsheimer); and *Pachybrachis morosus* Haldeman. *Pachybrachis bivittatus* and *P. hepaticus* were redescribed recently by Barney et al. (2013), with habitus photographs and distribution maps for eastern Canada. *Pachybrachis morosus* (= *Pachybrachis pubescens* Olivier, 1808) is the only member of Fall’s *pubescent* species-group found in the eastern USA. New state records are provided for these three species.

While Fall’s (1915) revision may be over 100 years old, I found his primary grouping to still be a useful starting point. When confronted with a selection of undetermined specimens, I first segregate beetles based upon Fall’s group characteristics: front femora not at all stouter (F); upper surface distinctly pubescent (A); elytra distinctly vittate (D); wholly or in great part black (E); and yellow or testaceous, often with black or brown markings (B and C). The key presented here is organized based upon these characteristics, augmented with descriptive terminology of the non-endophallic portion of the median lobe (aedeagus), which Fall did not provide. Dissection of a representative male is required for identification of most species, usually making identification of female-only series highly suspect. After using the key to tentatively make an identification, users should confirm their determination by consulting the cited publications, which provide redescriptions, distribution maps, biological notes, dorsal and lateral habitus, and images of the face, pygidium, and median lobe of the aedeagus in lateral and en-face views. Many species are presented two places in the key due to the variability of their external coloring.

In August 2016, Michael Geiser of the Natural History Museum in London (BMNH) contacted me about a recent discovery of previously unrecognized (or at least undatabased) type material of E. Suffrian and some other authors. Geiser hypothesized that the Suffrian material was in the Hamlet Clark and Joseph Baly collections acquired by the Museum in the late 1860–1880s. One of these specimens was designated a lectotype of *Pachybrachys spumarius* Suffrian, 1852 in a previous paper (Barney 2017a). Other relevant information is addressed in the Remarks section of the appropriate species below.

The purpose of this paper is to: (1) provide a key to the males of *Pachybrachis* currently known from the eastern USA; (2) collate type, figure, and map citations for all 64 species; and (3) correct or update any information provided in previous papers.

MATERIAL AND METHODS

Specimens Examined. Over 74,000 specimens of *Pachybrachis* were examined during the course of this study. To examine as many specimens of *Pachybrachis* from the eastern USA as possible,
121 loans were requested from 34 institutions and private collections (Riley and Barney 2015; Barney 2016a, h, 2017a, b, 2018a, b, 2019). The codens below are taken from Arnett et al. (1993) or improvised, and the curators or collection managers who provided specimens cited in this paper are indicated:

**BMNH** British Museum of Natural History, London, UK (Michael Geiser)
**BYUC** Monte L. Bean Life Science Museum, Brigham Young University, Provo, UT (Shawn Clark)
**CMNH** Carnegie Museum of Natural History, Pittsburgh, PA (Robert Davidson and Robert Androw)
**DAVC** Doug A. Veal Collection (private), Marion, IA
**INHS** Illinois Natural History Survey Insect Collection, Urbana, IL (Paul Tinerella)
**MCZ** Museum of Comparative Zoology, Harvard University, Cambridge, MA (Philip Perkins and Rachel L. Hawkins)
**MNHUB** Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (Johannes Frisch and Joachim Willers)
**MSUC** Michigan State University Collection, East Lansing, MI (Gary Parsons)
**NCSU** North Carolina State University Insect Museum, Raleigh, NC (Bob Blinn)
**NHMD** Natural History Museum of Denmark, Copenhagen, Denmark (Alexey Solodovnikov and Sree Selvathanar)
**OSUC** Ohio State University Collection, Columbus, OH (Luciana Musetti)
**PERC** Purdue Entomological Research Collections, West Lafayette, IN (Arwin Provsonsha and Eugenio Nearns)
**RJBC** Robert J. Barney Collection (private), Winfield, WV
**SDSU** South Dakota State University, Brookings, SD (Paul Johnson)
**SEMC** Snow Entomological Collections, University of Kansas, Lawrence, KS (Zack Falin)
**TAMU** Texas A&M University Collection, College Station, TX (Edward G. Riley)
**UGCA** University of Georgia Collection of Arthropods, Athens, GA (Cecil Smith and Joe McHugh)
**USNM** US National Museum of Natural History, Smithsonian Institution, Washington, DC (Alex Konstantinov)

**Terminology.** While descriptions, measurements, and photographs were provided in the cited publications for each species, many of the following terms are used in the key below. Body length (L) was measured from the leading edge of the vertex to the sutural apex of the elytra. The interocular distance (IOD) is the minimum distance between the upper lobes of the eyes.

Subtle variations in the median lobe (aedeagus) are particularly important in identifying species. The en-face view illustrates the distal en-face outline (DEO), the orificial space (OS), the basal plates (BP), the apicolateral margin (ALM), and the distal-most point or terminus (T). The lateral view better illustrates any inflation of the shaft and the presence or absence of an apicolateral angle (ALA), denticles, and setal groups (beard). En-face width (EFW) is the maximum width of the median lobe as seen in en-face view. When the postorificial length (POL) is examined from above, several species have an arrowhead-shaped distal end, often with paired denticles or rear-projecting protuberances at the ALA. To compare and differentiate these arrowhead-shaped structures in some species, three measurements were made: above arrowhead middle (AAM); above arrowhead length (AAL); and above arrowhead width (AAW).

**Key to the Males of Pachybrachis Species in the Eastern USA**

1. Front femora not at all stouter; eyes very small and remote; extensively punctured ....... 26. *P. hepaticus* (Melsheimer)  
1'. Front femora stouter; eyes not very small and remote; not extensively punctured ....... 2

2. Upper surface distinctly pubescent ............... 36. *P. morosus* Haldeman  
3. Elytra distinctly vittate ............... 4

3'. Elytra not distinctly vittate ............... 13

4. Without apical spur on the anterior tibia.. 5

4'. With apical spur on the anterior tibia ........... 9

5. Ventral surface of median lobe with keel.. 6

5'. Ventral surface of median lobe without keel ............... 8

6. Dark dorsal pattern weak, lateral elytral vitta essentially absent, reduced to humeral spot; keel of median lobe short, basal slope steeply inclined, distal slope gradually inclined to base of nodule, positioned on ventral surface within weakly sclerotized field ............... 45. *P. picturatus* (Germar)  
6'. Dark pattern of dorsum strong, lateral elytral vitta long, including humerus, weakly connected to or detached from inwardly curved subapical macula; keel of median lobe long, basal slope gradually inclined, distal slope more or less equally precipitous, surrounding uniformly sclerotized surface ............... 7

7. Median lobe with ALM broadly rounded, DEO oblique to terminus, nodule broadly
triangular; ventral surface of median lobe with crest of keel at about mid-length of shaft ............. 62. P. viduatus (Fabricius)
7'. Median lobe with ALM abruptly rounded, DEO transverse to terminus, nodule narrowly triangular; ventral surface of median lobe with crest of keel more distal .................. 5. P. bloxham Riley and Barney
8. Ventral surface of median lobe not inflated, curvature in profile minimal, flat subapically before base of nodule ...................... 29. P. kentuckyensis Riley and Barney
8'. Ventral surface of median lobe strongly inflated, curvature in profile evenly arched to base of nodule .................. 10. P. chester Riley and Barney
9. Punctuation of elytra in great part confused .... 4. P. bivittatus (Say)
9'. Punctuation of elytra arranged in evident regular series .................................. 10
10. Small, L <1.9 mm; Lakes Wales region of central Florida. .......... 17. P. deyrupi Barney
10'. Larger, L >2.0 mm; range not restricted to central Florida ...................... 11
11. Pronotal “M” moderate to heavy, black to reddish orange and sharply outlined, finely alutaceous and shiny, punctuation sparse and widely separated; aedeagal beads forming long, dense, inwardly curving wisps; south-eastern USA, Alabama to New Jersey .......................... 2. P. armbrusti Barney
11'. Pronotal “M” moderate to heavy, black, punctuation often strigose; aedeagal beads variable .................................. 12
12. Elytral vittae usually well-formed; pronotum strongly transverse with black, strigose punctuation covering entire area except for margins and narrow, median, anterior yellow stripe; aedeagal beads forming long, dense, inwardly curved wisps, orifical space with 2 sclerotized, triangular plates appearing as inwardly curved lamellae above the lateral basal plates .................. 41. P. othonus (Say)
12'. Elytra appearing black with subsutural vitta and margin yellow, each elytron with 2 discal vittae (often reduced or broken) and the subter black; pronotum yellow with moderate to broad, sharply defined, black “M,” lateral vittae rarely disconnected from median vitta; aedeagal bead short and fine, extending from widest point of median lobe to terminus .......... 38. P. nigricornis (Say) (in part)
13. Wholly or in great part black ............ 14
13'. Yellow or testaceous, often with black or brown markings .......................... 31
14. Protarsal claws distinctly enlarged ............... 15
14'. Protarsal claws not distinctly enlarged .......... 21
15. Median lobe of aedeagus with penicilli ..... .................................................. 16
15'. Median lobe of aedeagus without penicilli .............................................. 17
16. In en-face view, DEO of aedeagal median lobe gently rounded to nodule at terminus .................................. 43. P. peccans Suffrian (in part)
16'. In en-face view, DEO of aedeagal median lobe narrowed sharply at ALM to an extended, triangular post-orificial length that is deflexed to near 60° angle in lateral view .......... 19. P. diversus Fall (in part)
17. Pronotum black, margined with yellowish white; face yellow with black median line extending down from vertex between eyes, forming distinctive paired, yellow, inverted triangular maculae; eyes widely separated (IOD = 0.32–0.43 mm); median lobe in en-face view with ALM gently curved to rounded terminus; OS circular, basal plates sclerotized; beard with long setae visible from ALM to terminus; in lateral view, shaft inflated but truncate .......................... 14. P. confusus Bowditch (in part)
17'. Prothorax or elytra margined with red; face color variable; eyes not widely separated (IOD = 0.13–0.30 mm); median lobe not as above ................................ 18
18. Elytra entirely black to mottled with yellowish white; pronotum with anterior median line and sides red or reddish yellow ............ 32. P. luridus (Fabricius) (in part)
18'. Elytra with orange-red macula; pronotum variable ................................ 19
19. Elytra orange-red with wide, black sutural stripe not reaching apex; pronotum white with broadly diffuse black “M,” varying to completely black with white margins; Florida ......... 37. P. newmani Jacobson (= P. discoideus Bowditch)
19'. Elytra black with broad median fascia and apical spot red; pronotum not as above .......... 20
20. Large (L = 2.44–2.72 mm); median lobe in en-face view with OS much wider than POL, with elongated, distinct median and lateral basal plates; thickened, ALM rounded to a triangularly pointed terminus; in lateral view, ALM recurrave with denticles projecting basally towards much inflated POL .......... 18. P. dilatatus Suffrian
20'. Smaller (L = 1.97–2.35 mm); median lobe in en-face view narrow and long, with a large POL and elongated OS; DEO composed of a pointed terminus, with excurrevate ALM with denticles, therefore appearing as a median point with 2 lateral points; in lateral view, shaft very long and inflated, creating a long tube with the
3-pointed DEO ........................................ 56. *P. subfasciatus* (J. E. LeConte) (in part)

21. Entirely black, or pronotum and elytra may be margined with yellow ................. 22
21'. Not entirely black ................................. 23
22. Robust (L >2.9 mm), black, moderately shiny; external margins of pronotum and elytra pale yellow .................................................. 46. *P. praeclarus* Weise

22'. Smaller (L <2.5 mm), pronotum and elytra ranging from entirely black to obscurely margined with rufous to appearing black with subsutural vitta and margin yellow ........ 38. *P. nigricornis* (Say) (in part)

23. With apical spur on anterior tibia .......... 24
23'. Without apical spur on anterior tibia ...... 27
24. Median lobe with median orificial plate large and heavily sclerotized, conspicuous, shaped like an inverted ladle ........................................ 55. *P. stygicus* Fall (in part)

24'. Median lobe not as above ..................... 25
25. Face primarily pale yellow with black midline reduced; pygidium entirely black, protruding .............. 25. *P. gibsoni* Barney (in part)

25'. Face and pygidium primarily black ......... 26
26. POL deflexed at near 65° ALA, thereby creating a triangular, arrowhead-shaped area with a gently rounded terminus and 2 barely perceptible, posteriorly projecting denticles; yellow with diffuse maculae to nearly completely black ........................................................................ 28. *P. trinotatus* (Melsheimer) (in part)

27. Color of pale pronotal markings yellow; elytral pattern consisting of patchwork of yellow and black, apical declivity mostly yellow ........................................ 28

27'. Color of pale pronotal areas red or orange; elytra entirely black or basally with scattered orange maculae (or rarely mostly orange), apical declivity black ......................... 30
28. En-face outline of median lobe pentagon-shaped with thickened, elongate sides; POL very wide, with long setae visible at ALM; median lobe very stout and wide in lateral view, with an extended keel accentuated by 2 circular depressions behind ALM; extremely rare, only 2 males known ........................................ 64. *P. zellersorum* Barney

28'. En-face outline of median lobe not pentagon-shaped .......................................... 29
29. En-face outline of median lobe with shaft widest at ALM, side margins evenly, broadly, and rather distinctly emarginate behind; beard consisting of conspicuous wisp on each side .................................................. 16. *P. destructor* Riley and Barney

29'. En-face outline of median lobe of near equal width throughout, side margins of shaft little if at all tapered behind curvature of ALM; beard consisting of inconspicuous setal patch on each side .......................................................... 35. *P. m-nigrum* (Melsheimer)

30. Antennae orange to reddish; femora with pale spot; pronotum with side margins, apical edge, and 3 discal maculae orange-red or often this pattern greatly reduced to rarely absent; elytra usually with small, scattered orange-red or yellowish maculae basally or less commonly pale areas more extensive .............. 47. *P. pulvinatus* Suffrian

30'. Antennae and legs black; pronotum with side margins, apical edge, and 3 discal maculae red to red-orange; elytra black or black with few basal pale flecks ........................................ 58. *P. trinotatus* (Melsheimer)

31. Face with ocular lines or eyes almost touching ........................................ 32
31'. Face without ocular lines ..................... 38
32. Eyes very close, almost touching (IOD = 0.04–0.11 mm) .................................. 33
32'. Eyes moderate to widely separated (IOD >0.12 mm) .................................... 34
33. Front tibiae sinuate on inner margin; DEO of median lobe of aedeagus entire, thickened .................................................................................. 44. *P. pectoralis* (F. E. Melsheimer)

33'. Front tibiae unmodified on inner margin; DEO of median lobe of aedeagus with apical notch or thin .......... 53. *P. sobrinus* Haldeman

34. Ocular lines fine, reduced to short lines near top of upper lobes of eyes .......... 35
34'. Ocular lines prominent and distinct .......... 36
35. Dorsum whitish yellow with broad, sharply contrasted, even-bordered, black maculae .......................................................... 57. *P. tridens* (Melsheimer)

35'. Dorsum yellow with variable, indistinct, brown/black maculae .......................... 39. *P. obsoletus* Suffrian

36. Protarsal claws not distinctly enlarged; median lobe of aedeagus without penicilli; southern Florida; very rare ......................... 11. *P. clarki* Barney

36'. Protarsal claws distinctly enlarged; median lobe of aedeagus with penicilli ......... 37
37. In en-face view, DEO of aedeagal median lobe gently rounded to nodule at terminus .......... 43. P. peccans Suffrian (in part)

37'. In en-face view, DEO of aedeagal median lobe narrowing sharply at ALM to an extended, triangular post-orificial length that is deflexed to near 60° angle in lateral view ............ 19. P. diversus Fall (in part)

38. Protarsal claws distinctly enlarged .......... 39
38'. Protarsal claws not distinctly enlarged .......... 47

39. Eyes not closely separated (IOD <0.24 mm).. ...................................................... 40
39'. Eyes closely separated (IOD <0.24 mm) ....... ...................................................... 41

40. Eyes widely separated (IOD >0.32 mm); pronotum black, margined with yellowish white; face yellow with black median line extending down from vertex between eyes, forming distinctive paired, inverted, yellow, triangular maculae; median lobe in en-face view with ALM gently curved to rounded terminus; OS circular, basal plates sclerotized; beard with long setae visible from ALM to terminus; in lateral view, shaft of median lobe inflated but truncate .......... 14. P. confusus Bowditch (in part)

40'. Eyes moderately separated (IOD = 0.24–0.31 mm); pronotum yellow with brown to black M-shaped macula, not sharply defined; face yellow with brown median line extending down from vertex between eyes, punctuation sparse; median lobe in en-face view with a round to oval OS, extending apically as a groove between thickened ALM, thus forming a triangular extension of DEO; in lateral view, shaft of median lobe very long and inflated, creating a long tube with paired beards at widest point of OS and before triangular extension of DEO .......... 52. P. shirleyae Barney

41. Large, robust (L = 2.74–3.23 mm); yellow with red-brown to black maculae; elytra coarsely punctate, striae deeply impressed, marginal interspace impunctate; anterior and posterior maculae usually coalesce to form 2 irregular transverse fasciae; DEO of median lobe culminating in a triangular extension of terminus; in lateral view, ventral surface of median lobe broadly inflated, distinctly narrowed at basal contraction; beard consisting of long setae at ALM .......... 60. P. turbidus (LeConte)

41'. Small to medium size (L = 1.90–2.86 mm); elytra and median lobe not as above .......... 42

42. Medium size (L = 2.50–2.86 mm) .......... 43
42'. Small (L <2.40 mm) ......................... 44

43. Pronotum with anterior median line and sides red or reddish yellow ........................................ 32. P. luridus (Fabricius) (in part)

43'. Pronotum yellow with brown, M-shaped macula broad, not sharply defined; Florida ............... 50. P. rileyi Barney

44. Median lobe in en-face view like a home plate-shaped pentagon, with a flat base and parallel sides narrowing at the ALM to rounded terminus; extremely rare, only two known specimens from central Florida ......... 27. P. illectus Fall

44'. Median lobe not as above; not restricted to central Florida .................... 45

45. Elytra brown with broad median fascia and apical spot red; median lobe in en-face view narrow and long, with large POL and elongated OS; DEO composed of a pointed terminus, with excursive ALM with denticles, therefore appearing as a median point with 2 lateral points; in lateral view, shaft of median lobe very long and inflated, creating a long tube with 3-pointed DEO ................. 56. P. subfuscatus (J. E. LeConte) (in part)

45'. Elytra without broad, red median fascia or apical spot; median lobe not as above .......... 46

46. Median lobe in en-face view compressed with circular OS and darkly sclerotized median basal plate; DEO with ALM broadly and evenly rounded to a thick triangular nodule; in lateral view, ventral surface of median lobe broadly inflated, distinctly narrowed at basal contraction; beard consisting of long setae at ALM .......... 23. P. femoratus (Olivier)

46'. Median lobe in en-face view of near equal width throughout, ALM gently curving to terminus; OS about 2 times longer than wide; median basal plate pigmented; POL very small; beard inconspicuous with tips of longest setae visible in en-face view, more obvious in lateral view as apicolateral space patch, setae long, straight; ventral surface of median lobe inflated but narrowing quickly to terminus due to short POL ............... 51. P. sherrieae Barney

47. Median lobe tube-like, narrowing sharply to nodule ............ 54. P. spumarius Suffrian

47'. Median lobe not tube-like, various .......... 48

48. Yellow, standard brown/black maculae on elytra absent or reduced to four spots .......... 49
48'. Not primarily yellow, standard brown/black maculae on elytra variable to entirely black ........................................ 51

49. Each elytron with a small humeral and sub-apical black spot, baso-sutural punctures
confused; Florida and Georgia .................. 48. *P. quadrioculatus* Fall 49. Elytra without humeral and subapical black spots; punctures variable .................... 50 50. Baso-sutural punctures not confused; median lobe in en-face view parallel-sided, abruptly narrowing at ALM to rounded extended tip; in lateral view, ALA = 30° with setae along edges .................. 30. *P. iodingi* Bowditch 50'. Baso-sutural punctures confused; median lobe in en-face view with circular OS and darkly sclerotized median basal plate; en-face outline with ALM broadly and evenly rounded to a thick triangular nodule; in lateral view, ventral surface of median lobe broadly inflated, slightly narrowed at basal constriction ........... 59. *P. troosevelti* Barney 51. Protibiae emarginate inwardly at apex and with a long, spur-like process at inner angle .................. 6. *P. calcarius* Fall 51'. Protibiae unmodified .................. 52 52. Pronotum yellow with 3 brown vittae, middle vitta widest and expanded anteriorly; lateral vittae usually not complete; central Florida .................. 13. *P. conformis* Suffrian 52'. Pronotum not as above .................. 53 53. Face of male primarily pale yellow with black mid-line reduced; pygidium entirely black, protruding .................. 3. *P. atomarius* (Melsheimer) (in part) 53'. Face not primarily pale yellow, usually with diffuse, W-shaped macula connecting vertex and bases of antennae and up to base of upper lobes of eyes to entirely black; pygidium not entirely black, not protruding .................. 54 54. Median lobe with median orificial plate large and heavily sclerotized, conspicuous, shaped like an inverted laddle .................. 55. *P. stygicus* Fall (in part) 54'. Median lobe not as above .................. 55 55. Subplanar surface of median lobe with paired apico-marginal denticles or pointed protuberances .................. 56 55'. Subplanar surface of median lobe without paired apico-marginal denticles or pointed protuberances .................. 56 56. POL of median lobe arrowhead-shaped when viewed from above, with ALA deflected 90° from vertical at ALM .................. 57 56'. POL of median lobe with ALA deflected 80° at ALM .................. 62 57. Arrowhead-shaped POL with median, rear-projecting denticle, forming a diamond-shaped (<>) area when viewed from above ........... 31. *P. luctuosus* Suffrian 57'. Arrowhead-shaped POL without median, rear-projecting denticle .................. 58 58. Small (L <1.8 mm), M-shaped pronotal macula reduced to V shape; very rare, Illinois hill prairie ........... 7. *P. caroleae* Barney 58'. Larger (L >2.0 mm), M-shaped macula on pronotum .................. 59 59. Body primarily yellow and black; eyes widely separated (IOD >0.2 mm) .................. 60 59'. Body primarily yellow and rusty brown; eyes narrowly separated (IOD <0.2 mm) .................. 61 60. Body yellow-orange and black; pronotal “M” not distinct; arrowhead-shaped distal end of median lobe very large (AAW >0.16 mm), narrowing at ALM to form a lateral ridge ........... 34. *P. mcmenus* Barney 60'. Body pale yellow and black, pronotal “M” distinct; arrowhead-shaped distal end of median lobe smaller (AAW <0.15 mm), without narrowing at ALM or lateral ridge ........... 9. *P. charlottae* Barney 61. EFW of median lobe very wide (>0.25 mm), arrowhead-shaped distal end very large (AAW >0.16 mm); Florida .................. 63. *P. walteri* Barney 61'. EFW of median lobe not wide (<0.25 mm), arrowhead-shaped distal end not large (AAW <0.15 mm) .................. 12. *P. confederatus* Fall 62. Subplanar surface of median lobe inflated, with distinct ridge .................. 63 62'. Subplanar surface of median lobe not inflated, without distinct ridge .................. 64 63. Arrowhead-shaped distal end of median lobe arising from subplanar, mid-line ridge ........... 8. *P. cephalicus* Fall 63'. Arrowhead-shaped distal end of median lobe arising from inverted, Y-shaped, subplanar ridge with paired, deep, circular depressions .................. 22. *P. erinae* Barney 64. Primarily black; elytral maculae black with small areas of whitish yellow, pronotum almost entirely black .................. 25. *P. gibsoni* Barney (in part) 64'. Primarily yellow; elytral maculae brown to reddish brown .................. 65 65. reddish brown, pronotum with M-shaped macula distinct; median lobe in en-face view not abruptly narrowed at ALM; central Florida .................. 1. *P. archboldi* Barney 65'. Pale brown, M-shaped macula on pronotum not distinct; median lobe in en-face view abruptly narrowed at ALM to extended arrowhead-shaped tip; very rare, Florida panhandle .................. 24. *P. gibbyi* Barney 66. Median lobe in en-face view distinctly widest at thickened and expanded ALM, with a prominent nodule .................. 15. *P. cubs* Barney 66'. Median lobe in en-face view not as above ... 67
RESULTS

The 64 species of Pachybrachis found in the eastern USA are listed below in alphabetical order. For each species, the following information is provided: (1) the type and its depository; (2) figure and map citation from the literature; (3) synonymy; and (4) additional information not in earlier publications, which pertains to type material, distribution, biological notes, and other remarks. Users should consult the cited publications that provide redescriptions, distribution maps, biological notes, dorsal and lateral habitus, and images of the face, pygidium, and median lobe of the aedeagus in lateral and en-face views.

1. Pachybrachis archboldi Barney, 2016 (Holotype in MCZ).
   Barney 2016a: fig. 6; map 2.

2. Pachybrachis armbrusti Barney, 2016 (Holotype in MCZ).
   Barney 2016b: fig. 2; map 1B.

   Synonym. Pachybrachys litigiosus Suffrian, 1852 (partim).

3. Pachybrachis atomarius (Melsheimer, 1847) (Lectotype in MCZ).
   Barney 2018a: figs. 4, 22A–B; map 1B.

   Synonyms. Pachybrachis infanaustus Haldeman 1849 (Lectotype in MCZ); Pachybrachys atomus Bowditch 1909 (Lectotype and paralectotypes in MCZ).

4. Pachybrachis bivittatus (Say, 1824)
   Barney et al. 2013: habitus 2, map 2.

   Remarks. Say’s type, reported as found “near the Rocky Mountains”, is not extant (Weiss and Ziegler 1931). Fall (1915) made no mention of seeing a type and noted that Bowditch often mistakenly used the name P. viduatus for P. bivittatus.

   Pachybrachis bivittatus is one of the largest, commonest, most widespread, and easily identifiable species in the eastern USA. It is likely found in all 48 contiguous states. Riley et al. (2003) listed 34 states, five Canadian provinces, and Mexico. Further research may reveal that multiple species are represented.

   There are multiple reports of P. bivittatus being found on Salix spp. (Salicaceae), which I can confirm from personal experience in Arizona, Colorado, Florida, Illinois, Indiana, Kansas, Nebraska, Utah, and Wisconsin. Pachybrachis bivittatus is one of the few species of Pachybrachis whose biology has been studied in any detail. Egg and larval case formation was reported by Lawson (1976). LeSage (1985) described the eggs and larvae of P. bivittatus and confirmed that larvae feed in the leaf litter of dead willow.

5. Pachybrachis bloxham Riley and Barney, 2015 (Holotype in TAMU).
   Riley and Barney 2015: figs. 15, 19; map 3.

   Remarks. At the time of description (Riley and Barney 2015), only 15 specimens had been examined. Twelve additional specimens have since been collected: FLORIDA: Leon Co., Bloxham, jot. 20 & 267, Power line @ Lone Star, 30.3883° N 84.6311° W, 20-27.v.2017, R. J. Barney [1♂ 1♀, RJBC]; Walton Co., 1 mi NE Seagrove Beach, 30.3226° N 86.1198° W, 20-26.v.2017, R. J. Barney [4♂ 6♀, RJBC].
6. Pachybrachis calcaratus Fall, 1915 (Lectotype in MCZ).
Barney 2018a: fig. 3; map 1A.

Barney 2018a: fig. 13; map 2B.

8. Pachybrachis cephalicus Fall, 1915 (Lectotype in MCZ).
Barney 2018a: fig. 18; map 3A.

Barney 2018a: fig. 15; map 3A.

Riley and Barney 2015: figs. 16, 20; map 3.

Remarks. At the time of description (Riley and Barney 2015), USNM was anticipated as the location of the holotype. However, the depository has subsequently been changed to MCZ.

Barney 2016a: fig. 2; map 2.

12. Pachybrachis confederatus Fall, 1915 (Lectotype in MCZ).
Barney 2018a: figs. 17, 22F; map 3A.

Synonym. Pachybrachys tybeensis Fall, 1915 (Lectotype in MCZ).

13. Pachybrachis conformis Suffrian, 1852 (Neotype in MCZ).
Barney 2016a: fig. 1; map 1.

Remarks. At the time of neotype designation (Barney 2016a), USNM was anticipated as the location of the neotype. However, the depository has subsequently been changed to MCZ.

Two females recently recovered from BMNH are labeled “TYPE [printed, white paper] // E. Coll. / Chev.” [hand-inked, tan paper] // 67 56 // 16 [printed, white paper] // conformis // conformis // type / Suffr / Am. Sept. [hand-inked, green paper]” and “Type / Suffr / Coll. / Deyrolle // Pachybrachys / conformis / Suffr / Columbia [hand-inked, tan paper] // Baly Coll. [printed, white paper] // Pachybrachys / conformis / By Suffr. / Brazil [hand-inked, green paper]”. “Am. Sept.” on the first specimen is presumably an abbreviation for America Septentrionalis, meaning North America. The second specimen has “Columbia” on one label and “Brazil” on another. These two females superficially look to be the same species as two other females designated as lectotype and parallectotype by MNHUB in 2013 (Barney 2016a). Suffrian (1852) reported the specimen(s) he examined to be “From the eastern territories without details of the fatherland (Mus. Chevolat.)”. Blackwelder (1946) listed *P. conformis* as from Colombia.

The species concept of *P. conformis* for which I designated a neotype from Florida, USA (Barney 2016a) does not match the four females cited above in the BMNH and MNHUB, at least three of which are apparently from South America. Further research will be required to determine if Suffrian’s true *P. conformis* is a South American species and that a new species designation is needed for the species found on *Dalea faeia* (Chapman) Barneby (Fabaceae) in central Florida.

Barney 2017a: figs. 7, 10E; map 2B.

Synonym. Pachybrachys proximus Bowditch, 1909 (Preoccupied).

Remarks. Species treated in the revision of the *luridus* species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for *P. confusus* are PL = 0.78–0.90 mm and PW = 1.03–1.20 mm.

15. Pachybrachis cubs Barney, 2019 (Holotype in OSUC).
Barney 2019: fig. 3; map 1.

16. Pachybrachis deceptor Riley and Barney, 2015 (Holotype in MCZ).
Riley and Barney 2015: figs. 6, 8; map 1.

17. Pachybrachis deyrupi Barney, 2016 (Holotype in MCZ).
Barney 2016a: fig. 5; map 1.

18. Pachybrachis dilatatus Suffrian, 1852 (Neotype in UGCA).
Barney 2017a: fig. 2; map 1A.

Remarks. Species treated in the revision of the *luridus* species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for *P. dilatatus* are PL = 0.73–0.85 mm and PW = 1.21–1.32 mm.

19. Pachybrachis diversus Fall, 1915 (Lectotype in MCZ).
Barney 2018b: figs. 6, 7I; map 1C.

20. Pachybrachis dixianus Fall, 1915 (Lectotype in MCZ).
Barney 2018a: fig. 12; map 2B.

Synonym. Pachybrachys cephalicus var. dixianus Fall, 1915.
21. *Pachybrachis ekstromorum* Barney, 2019  
(Holotype in CMNH).  
Barney 2019: fig. 2; map 1.

22. *Pachybrachis erinae* Barney, 2017  
(Holotype in MCZ).  
Barney 2018a: fig. 19; map 3B.

23. *Pachybrachis femoratus* (Olivier, 1808)  
(Neotype in MCZ).  
Barney 2017a: figs. 3, 9E–F; map 1B.  
**Synonyms.** *Cryptocephalus sparsus* Newman 1840 (Type unknown); *Pachybrachys characteristicus* Suffrian 1852 (Lectotype in MNHUB); *Pachybrachys femoratus* var. *aquilonis* Fall 1915 (Holotype in MCZ).  
**Remarks.** A potential type specimen of *C. sparsus*, labeled “Type / H. T/ [circular white disc with red border] // 82 / Cryptocephalus / sparsus  
Newman [hand-inked, blue paper]”, was recently discovered at BMNH. Unfortunately, no definitive confirmation can be made as the head, prothorax, and left elytron are missing.

Species treated in the revision of the *luridus* species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for *P. femoratus* are PL = 0.60–0.72 mm and PW = 0.89–1.03 mm.

24. *Pachybrachis gibbyi* Barney, 2017  
(Holotype in TAMU).  
Barney 2018a: fig. 21; map 3A.  
**Remarks.** The holotype’s label was reported in error (Barney 2018a). Instead of “circular blue disc signifying dissection by RJB”, it should read “circular pink disc signifying dissection by EGR”. EGR is Edward G. Riley, who collected the series. Also, the genitalia are not affixed to a second point but are actually glued between the specimen and the pygidium.

25. *Pachybrachis gibsoni* Barney, 2017  
(Holotype in MCZ).  
Barney 2018a: fig. 20; map 3B.

26. *Pachybrachis hepaticus hepaticus* (F. E. Melsheimer, 1847)  
(Type in MCZ).  
Barney et al. 2013: habitus 5, map 5.  
**Synonym.** *Cryptocephalus punctatus* Haldeman, 1849 (Type in MCZ).  
**Remarks.** *Pachybrachis hepaticus* is most likely found in all 48 contiguous states. Riley et al. (2003) listed 34 states, five Canadian provinces, Mexico, and Central America. Further research may reveal that multiple species are represented and that *P. hepaticus* deserves its own genus rather than placed in *Pachybrachis*.

27. *Pachybrachis illectus* Fall, 1915  
(Holotype in USNM).  
Barney 2016a: fig. 3; map 1.

(Holotype in MCZ).  
Barney 2018a: fig. 6; map 1C.

(Holotype in MCZ).  
Riley and Barney 2015: figs. 17, 21; map 4.

30. *Pachybrachis lodingi* Bowditch, 1909  
(Lectotype and paralectotypes in MCZ).  
Barney 2018a: figs. 1; map 1A.

31. *Pachybrachis lactusosus* Suffrian, 1858  
(Syn-  
type in MNHUB).  
Barney 2018a: figs. 7, 22D–E; map 1C.  
**Synonym.** *Pachybrachys carolinensis* Bowditch, 1910 (Lectotype and Paralectotype in MCZ).

32. *Pachybrachis luridus* (Fabricius, 1798)  
(Lectotype in NHMD).  
Barney 2017a: figs. 5, 10A–D; map 2A.  
**Synonyms.** *Cryptocephalus aesculi* F. E. Melsheimer, 1847 (Lectotype in MCZ); *Pachybrachys luridus* var. *nigrinus* Blatchley, 1910 (Holotype in PERC); *Pachybrachys luridus* var. *festivus* Fall, 1915 (Holotype in MCZ).  
**Remarks.** Species treated in the revision of the *luridus* species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for *P. luridus* are PL = 0.81–0.95 mm and PW = 1.22–1.42 mm.

33. *Pachybrachis matthewi* Barney, 2017  
(Holotype in MCZ).  
Barney 2018a: fig. 9; map 2A.

34. *Pachybrachis mcmeansi* Barney, 2017  
(Holotype in MCZ).  
Barney 2018a: fig. 14; map 2B.

35. *Pachybrachis m-nigrum* (F. E. Melsheimer, 1847)  
(Lectotype and paralectotypes in MCZ).  
Riley and Barney 2015: figs. 4, 5, 9; map 1.  
**Synonym.** *Pachybrachys intricatus* Suffrian, 1858 (Lectotype and paralectotypes in MNHUB).

36. *Pachybrachis morosus* Haldeman, 1849  
(Type in MCZ).  
**Synonym.** *Pachybrachis pubescens* Olivier 1808 (Type unknown).  
**Remarks.** Fall’s (1915) Group A consisted of 14 species with the “upper surface distinctly pubescent,” with *P. morosus* being the only species
found in the eastern USA. However, Fall stated that he
was not sure of the distinction between P. morosus and
Pachybrachis haematodes Suffrian. Pachybrachis
morosus is known to be associated with southern red
oak, Quercus falcata Michx., and blackjack oak,
Quercus marilandica Munchh. (Fagaceae).

37. Pachybrachis newmani Jacobson, 1901 (Type
unknown). New Status
Barney 2016a: fig. 2; map 2.

Synonym. Cryptocephalus limbatus Newman,
1840 (Type unknown); Pachybrachys discoideus
Bowditch, 1909 (Holotype in SEMC), New Synonymy.

Remarks. A recently discovered female spec-
imen in BMNH is labeled “Ent. Club. / 44-12.
[printed, white paper] // Cryptocephalus / limbatus
Newm [hand-inked, white paper] // SYN / TYPE
[circular white disc with blue border]” and allegedly
from Suffrian’s collection. Michael F. Geiser
(BMNH) recently brought to my attention a footnote
that proposed Pachybrachis newmani Jacobson as a
replacement name for P. limbatus which was a
homonym (Jacobson 1901). The footnote, in a
rather obscure Finnish journal, reads “P. limbatus
Newm. 1840 et Leconte 1880 (non Ménétr. 1836) –
newmani nom. Nov. renominandum est.” This gives
P. newmani priority and P. discoideus becomes a
synonym. Clavareau (1913) listed P. discoideus
and P. newmani from Florida and P. limbatus
from Turkey and Greece.

38. Pachybrachis nigricornis (Say, 1824) (Neo-
paratype in SDSU).
Barney 2016b: figs. 5, 6A–E; map 2A, B.

Synonyms. Pachybrachys carbonarius Halde-
man, 1849 (Holotype in MCZ); Pachybrachys auto-
lycus Fall, 1915 (Holotype in MCZ); Pachybrachys auto-
lycus var. difficilis Fall, 1915 (Holotype in MCZ);
Pachybrachys autolycus var. wahsatchensis Fall, 1915
(Holotype in MCZ); Pachybrachys autolycus var.
janus Fall, 1915 (Holotype in MCZ).

39. Pachybrachis obsoletus Suffrian, 1852 (Holo-
type in MNHUB).
Barney 2018b: figs. 5, 7G; map 1B.

40. Pachybrachis osceola Fall, 1915 (Holotype in
USNM).
Barney 2016a: fig. 4; map 1.

41. Pachybrachis othonus (Say, 1825) (Type
unknown).
Barney 2016b: figs. 1, 6F; map 1A, B.

Synonyms. Cryptocephalus marginaticollis
Randall, 1838 (Type unknown); Pachybrachys
litigiosus Suffrian, 1852 (Syntype in MNHUB);
Pachybrachis othonus sioux Balsbaugh, 1973
(Paratype in SDSU).

42. Pachybrachis parvus Fall, 1915 (Lectotype
in MCZ).
Barney 2018a: fig. 11; map 2B.

Synonym. Pachybrachys cephalicus var. par-
vus Fall, 1915.

43. Pachybrachis peccans Suffrian, 1852 (Syntype
in MNHUB).
Barney 2018b: figs. 5, 7H; map 1C.

44. Pachybrachis pectoralis Blatchley, 1847 (Lectotype
and paraleptotypes in MCZ).
Barney 2018b: figs. 1, 7A; map 1A.

45. Pachybrachis picturatus (German, 1824) (Type
unknown).
Riley and Barney 2015: figs. 3, 7; map 4.

46. Pachybrachis praeclarus Weise, 1913 (Type
unknown).
Barney 2016b: figs. 4, 6F; map 2B.

Synonym. Pachybrachys elegans Blatchley,
1910 (Holotype in PERC).

47. Pachybrachis pulvinatus Suffrian, 1852 (Type
unknown).
Riley and Barney 2015: figs. 11, 13–14; map 2.

Remarks. Three specimens (1♂ 2♀) recently
discovered in BMNH were identified as P. pulvi-
натус. The male is labeled “E. Coll. / Chev. / / P. pulvi-
[hand-inked, white paper].” One female is labeled
“Carolina [hand-inked, green paper] // Named / by
Suffr. / Coll. / Deyrolle // Pachybrachys / pulvinatus
/ Suffr / N. America [hand-inked, tan paper] // Baly
Coll. [printed, white paper].” The remaining female
is labeled “Colorado Coll. / 1905-1913. [printed, tan paper] // Pachybrach / luridus / Fab / Am. Bor.
[hand-inked, tan paper] // Standingas / P. pulvinatus
[hand-inked, white paper].” While the second fe-
male is actually P. atomarius, the other two spec-
imens are possible neotypes.

48. Pachybrachis quadrioculatus Fall, 1915 (Lec-
totype in MCZ).
Barney 2018a: fig. 2; map 1A.

49. Pachybrachis relictus Fall, 1915 (Lectotype
in MCZ).
Barney 2018a: fig. 10; map 2.

50. Pachybrachis rileyi Barney, 2016 (Holotype in
TAMU).
Barney 2016a: fig. 7; map 2.

51. Pachybrachis sherriae Barney, 2017 (Holotype
in MCZ).

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Barney 2017a: fig. 8; map 2B.

Remarks. Species treated in the revision of the luridus species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for P. shirleyae are PL = 0.63–0.75 mm and PW = 0.96–1.07 mm.


Pachybrachys biguttatus Synonyms.  
Pachybrachys oculatus Synonyms.  
Pachybrachis troosevelti Synonyms.  
Pachybrachis shirleyae Barney, 2017 (Holotype in MCZ).

Barney 2017a: fig. 4; map 1B.

Remarks. Species treated in the revision of the luridus species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for P. shirleyae are PL = 0.62–0.77 mm and PW = 0.94–1.08 mm.

Pachybrachis sobrinus Haldeman, 1849 (Lectotype in MCZ).

Barney 2018b: figs. 2, 7B; map 1A.

Synonyms. Pachybrachys oculatus Suffrian, 1852 (Type unknown); Pachybrachys sticticus Blatchley, 1910 (Lectotype in PERC).

Pachybrachis spumarius Suffrian, 1852 (Lectotype in BMNH).

Barney 2017b: fig. 1; map 1.

Synonyms. Pachybrachys roboris Fall, 1915 (Holotype in MCZ); Pachybrachys obfuscatus Fall, 1915 (Holotype in MCZ).

Pachybrachis stygicus Fall, 1915 (Lectotype in MCZ).

Barney 2018a: figs. 5, 22C; map 1B.

Synonym. Pachybrachys vestigialis Fall. 1915 (Lectotype in MCZ).

Pachybrachis subfasciatus (J. E. LeConte, 1824) (Neotype in INHS).

Barney 2017a: figs. 1, 9A–D; map 1A.

Synonyms. Pachybrachys biguttatus Suffrian, 1852 (Type unknown); Pachybrachys impurus Suffrian, 1852 (Neotype in TAMU); Pachybrachys xanthias Suffrian, 1852 (Type unknown, uncertain application); Pachybrachys impurus var. umbrosus Fall, 1915 (Holotype in MCZ).


Remarks. Species treated in the revision of the luridus species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for P. subfasciatus are PL = 0.58–0.74 mm and PW = 0.87–1.04 mm.

A virtually all black specimen of P. subfasciatus was found in the BYUC and is labeled “WEST VIRGINIA, Grant Co. / 2.3 km NNW Landes / Cave Mountain, 38°54.78″ N, / 79°12.83″ W, alt. 2190 ft., / 8–VI–2001, R. A. Androw.”

57. Pachybrachis tridens (F. E. Melsheimer, 1847) (Lectotype and paralectotypes in MCZ).

Barney 2018b: figs. 3, 7D; map 1B.

Synonyms. Cryptocephalus flavicornis (F. E. Melsheimer, 1847) (Lectotype in MCZ); Pachybrachis mollis Haldeman, 1849 (Lectotype in MCZ).

58. Pachybrachis trinotatus (F. E. Melsheimer, 1847) (Lectotype and paralectotypes in MCZ). Riley and Barney 2015: figs. 10, 12; map 2.

59. Pachybrachis troosevelti Barney, 2019 (Holotype in MCZ).

Barney 2019: fig. 4; map 1.

60. Pachybrachis turbidus J. L. LeConte, 1880 (Holotype in MCZ).

Barney 2017a: figs. 6, 10F; map 2A.

Remarks. Species treated in the revision of the luridus species-group (Barney 2017a) were inadvertently reported with the pronotal length (PL) and pronotal width (PW) reversed. The correct measurements for P. turbidus are PL = 0.92–1.19 mm and PW = 1.40–1.66 mm. A new state record was found: IOWA: Fremont Co., Waubonsie State Park, 12.vi.2004, D. Veal [1♀, DAVC]; same data, except 28.vi.2010 [1♀, DAVC].

61. Pachybrachis varians Bowditch, 1909 (Lectotype and paralectotypes in MCZ).

Barney 2018a: fig. 8; map 2A.

62. Pachybrachis viduatus (Fabricius, 1801) (Neotype in MSUC).

Riley and Barney 2015: figs. 18, 22; map 3.

Remarks. Riley and Barney (2015) designated a neotype for P. viduatus when no type material could be found. However, a subsequent...
loan request to NHMD for specimens of *P. luridus* in the Fabricius material (Barney 2017) resulted in the serendipitous discovery of a specimen of *P. viduatus*. The specimen is in poor shape, having been pinned through the rear half of the right elytron and subsequently missing the pygidium and legs; therefore, no definitive determination was made as to type status of this specimen.

Two female specimens recently discovered in BMNH are labeled “E. Coll. / Chev.1 // ????? / 3 // 6756 [hand-inked, tan paper] // viduatus ????? / Say Suffîr ???? / bivittatus ???? / ????? / Carolina [hand-inked, green paper] // m-nigrum / (see G. Horn) [hand-inked, tan paper]” and “Named / by Suffîr / Coll. / Deyrolle // Pachybrachys / viduatus / Fabr / N. America [hand-inked, tan paper].” These specimens appear to be *P. viduatus* and possible lectotypes, but designation was not made without confirmation via dissection of a male (Riley and Barney 2015).

63. *Pachybrachis walteri* Barney, 2017 (Holotype in MCZ).
Barney 2018a: fig. 16; map 3A.

64. *Pachybrachis sellersorum* Barney, 2019 (Holotype in NCSU).
Barney 2019: fig. 1; map 1.

**Acknowledgments**

Extreme gratitude is conveyed to the curators and collection managers who provided specimen loans for this study, especially Philip Perkins and Rachel Hawkins (MCZ) and Michael Geiser (BMNH).

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(Received 27 September 2018; accepted 13 January 2019. Publication date 25 March 2019.)