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Descriptions of four new species of *Leptophloeus* Casey (Coleoptera: Laemophloeidae) from the United States

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1104: 1–13 **INSECTA MUNDI** 2025

Descriptions of four new species of *Leptophloeus* Casey (Coleoptera: Laemophloeidae) from the United States

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Abstract. Four **new species** of *Leptophloeus* Casey (Coleoptera: Laemophloeidae) are described: *L. barbarus* Thomas and Schnepp is described from Florida; *L. glacialis* Thomas and Schnepp is described from Alaska; *L. peregrinus* Thomas and Schnepp is described from Hawaii; and *L. shoshone* Thomas and Schnepp is described from Wyoming. Diagnoses and figures are provided for the new species.

Key words. Flat bark beetles, taxonomy, systematics.

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Introduction

Over the past several decades a number of exotic, mostly Asian, laemophloeids have been collected in Florida and Hawaii. This paper deals with two of these apparently immigrant species of the genus *Leptophloeus* Casey, plus two, presumably indigenous, species recently discovered in Wyoming and Alaska.

Leptophloeus currently consists of 29 described species (Thomas, unpub.), with most of the described species in Europe (5 species; Lefkovitch 1959), Africa (17 species; Lefkovitch 1962), and Japan (4 described, 3 unidentified species; Hirano 2009). This distribution reflects taxonomic activity more than relative richness of the fauna, and there appear to be many undescribed species. Unfortunately, even the described species are difficult to identify, and named specimens are of uncertain identity at best. Karner (1997) provided the first real breakthrough by illustrating details of the genitalia of four European species, and showed that the best diagnostic characters are in the bursa copulatrix of the female. Since the genitalia of none of the other species have been illustrated, nor have habitus illustrations been provided for most, we are treating the two exotic species described here as new. It would require a full revisionary treatment of the genus, with access to type specimens, to establish the identities of the remainder of the genus. Providing names for the two established immigrant species will facilitate future ecological or biocontrol work. Species in Vega et al. (1999) may or may not be conspecific with the species described here, specimens from that study were not available for comparison.

Materials and Methods

Habitus photos were taken through a Leica Z16 APO microscope equipped with a JVC KY-F75U 3-CCD camera and controlled by Syncroscopy AutoMontage® software; high magnification photographs of genitalia were taken using a Leica DM 2500 microscope and resulting image stacks were processed using CombineZP®. Scanning electron photomicrographs were produced with a JEOL JSM-5510LV. Images were post-processed with Jasc Paint Shop Pro 7® and plates were assembled with GIMP 2.10.12. Genitalia were dissected as described in Thomas (1984) and were slide-mounted in Hoyer's solution for photography. Subsequently, they were soaked off the slide and imbedded in a drop of dimethyl hydantoin formaldehyde on the card point with the respective specimen. Genitalic terminology follows that used in Thomas (1984).

Measurements, using the measuring utility in Leica Application Suite v. 3 on a Leica M205C, were taken as follows: **Length:** Total body length was derived by adding the following measurements: Head from anterior-most point of epistome to basal line at middle (or anterior edge of pronotum if head withdrawn). Pronotum from anterior edge to posterior edge at middle. Elytra from anterior edge of scutellum to posterior-most point of elytron. **Width:** Head widest point across eyes. Pronotum widest point, usually behind anterior angles. Elytra across widest point of one elytron and doubled for total width. Label data for types of new species are reported verbatim; data are surrounded by quotes, and separate labels are indicated by a forward slash (/).

Codens for collections referred to in the text are:

BMNH British Museum of Natural History, London, England
BPBM Bernice P. Bishop Museum, Honolulu, Hawaii, U.S.A.
FSCA Florida State Collection of Arthropods, Gainesville, Florida, U.S.A.
INHS Illinois Natural History Survey, Champaign, Illinois, U.S.A.
KESC Kyle E. Schnepp Collection, Gainesville, Florida, U.S.A.
KNWR Kenai National Wildlife Refuge Collection, Soldotna, Alaska, U.S.A.
UAMC University of Alaska Museum, Entomology Collection, Fairbanks, Alaska, U.S.A.
USNM National Museum of Natural History, Smithsonian Institution, Washington, D.C., U.S.A.
UWIM University of Wyoming Insect Museum, Laramie, Wyoming, U.S.A.

Systematics

Leptophloeus Casey, 1916

Type species. *Laemophloeus angustulus* LeConte, 1866

Diagnosis. *Leptophloeus* can be distinguished from other genera of Laemophloeidae in the United States by the combination of: antennal pedicel longer and larger than antennomere III; pedicel attached axially to the scape, which is unmodified in both sexes; transverse epistomal groove absent; epistome truncate or emarginate anteriorly; lateral margins of the pronotum parallel or evenly curved, at most slightly sinuate, not undulate; intercoxal process of sternum III narrowly rounded.

Discussion. The genus *Leptophloeus* is not well defined and the genera *Cryptolestes* Ganglbauer *Dysmerus* Casey, and *Narthecius* LeConte generally grade into one another (Thomas 1993). *Cryptolestes* have a broader body form and broader intercoxal process of sternum III, while *Leptophloeus* are more subcylindrical and have a narrower intercoxal process of sternum III. *Dysmerus* are sexually dimorphic with the males having a modified antennal scape, while *Leptophloeus* are generally not sexually dimorphic, although males are sometimes more robust and have larger mandibles. *Narthecius* are also subcylindrical but have an acuminate epistome instead of a truncate or emarginate epistome in *Leptophloeus*. More work is needed to understand these generic relationships.

One species, *Leptophloeus angustulus* (LeConte), was previously known to occur in the eastern United States. While the generic limits are not fully understood, four additional species are added to this genus here, bringing the total fauna of *Leptophloeus* in the United States to five species. These five are broadly distributed from south Florida and the eastern United States to Wyoming, Alaska, and Hawaii.

Key to species in the United States

1. Clypeus distinctly emarginate, anterior clypeal angles acute (Fig. 13); tarsomeres 1–3 with ventral setae twice as long as source tarsomere; Hawaii . . . . . ***Leptophloeus peregrinus*, new species**
— Clypeus truncate, not distinctly emarginate, anterior clypeal angles square or obtuse; tarsomeres 1–3 with ventral setae as long as or just longer than source tarsomere **2**

2(1). Punctures of head and pronotum coarse, space between punctures less than the diameter of puncture (Fig. 12, 14); eastern United States . . . . . ***Leptophloeus angustulus* (LeConte, 1866)**
— Punctures of head and pronotum fine, space between punctures as large as or larger than the diameter of puncture (Fig. 11, 13); Florida, western United States **3**

3(2). Bursa copulatrix circular, at least ten times longer than wide (Fig. 2); Florida . . . . . ***Leptophloeus barbarus*, new species**

— Bursa copulatrix small, fish hook type, at most five times longer than wide (Fig. 3, 6); western United States **4**

4(3). Bursa copulatrix evenly rounded externally (Fig. 3) . . . . . ***Leptophloeus glacialis*, new species**

— Bursa copulatrix angulate externally, slightly deflexed apically (Fig. 6) . . . . . ***Leptophloeus shoshone*, new species**

Leptophloeus barbarus Thomas and Schnepp, new species

Figures 2, 7, 10–11, 15

Diagnosis. Adults can be distinguished from other congeners in the United States by the combination of the following character states: From *Leptophloeus angustulus* (Fig. 12, 14), the only other known species of *Leptophloeus* in the eastern United States, *L. barbarus* (Fig. 11) can be recognized by the finer punctures and pubescence of the head and pronotum, shape of the pronotum, and the long and somewhat circular bursa copulatrix, resembling in general, but not in detail, that of the European *Leptophloeus juniperi* Grouvelle (Fig. 4), and differing from all others treated here.

Description, holotype female. Length 1.7 mm; elongate, parallel-sided; dorsal surface dark testaceous, smooth and shiny; mouthparts, legs, elytra, and antennae paler.

Head: Width across eyes 1.9× length; longitudinal line not distinguishable; surface moderately, shallowly punctate, punctures smaller than an eye facet, separated by 3–4 diameters, each subtending a thick, subdepressed seta of various orientations; surface between punctures obscured by pubescence but microsculpture evident at least laterally. Epistome medially straight or very slightly emarginate; without a distinct marginal line. Lateral line consisting of broad groove bordered by a ridge; occipital line distinct and complete. Labrum large, weakly emarginate; mandibles large, rather elongate, subequal in length to head. Eyes about 0.3× length of head, weakly convex. Antennal insertion not visible in dorsal view; antennae short, attaining base of pronotum; scape longer than broad; pedicel slightly elongate, about 0.8× length of scape; III elongate, 0.7× length of scape; ratios of antennomeres 1.7, 1.4, 1.3, 1.0, 1.0. 1.1, 1.1, 1.0, 1.4, 1.4, 1.7.

Thorax: Pronotum quadrate, as wide as long; widest just behind apical angle; anterior angles acute, strongly produced; hind angles obtuse, not produced; punctation and pubescence similar to head. Elytra 2.1× longer than wide. Tarsal formula, 5-5-5.

Bursa copulatrix: Long and more or less circular (Fig. 2).

Description, allotype male. Length 2.1 mm; elongate, parallel-sided; dorsal surface dark testaceous; mouthparts, elytra, legs, and antennae paler.

Head: Width across eyes 1.5× length; surface sculpture and pubescence as in female. Mandibles expanded lateroventrally at base.

Thorax: As broad as long, more robust than female; surface sculpture and pubescence as in female. Tarsal formula, 5-5-4.

Male genitalia: The basal armature of the internal sac consists of two rods, the external one rather sharply crescentic, the interior one squarely angulate (Fig. 7).

Variation. The only variation observed among individuals of this species was body length, with paratypes ranging from 1.7–1.9 mm. Males can be distinguished by their 5-5-4 tarsal formula and mandibles expanded laterobasally.

Distribution. Known only from Broward, Miami-Dade, and Palm Beach counties, on the Florida mainland southernmost east coast.

Materials examined. Holotype: Female, deposited in FSCA, with following label data: "USA: Florida: Dade Co: Homestead: Navy Wells Preserve 25.44, −80.50, 5-ii.2013 Lindgren funnel trap w/ EtOH, Col: R. Derksen" / "[on red] HOLOTYPE *Leptophloeus barbarus* Thomas and Schnepp 2021". **Allotype:** Male, deposited in FSCA, with following label data: "FLORIDA: Broward Co. Fort Lauderdale, EtOH Lindgren funnel E-6-b M Meadows 28-VIII-2006" / "[on red] ALLOTYPE *Leptophloeus barbarus* Thomas and Schnepp 2021".

Paratypes. Total = 29, as follows: 2 (FSCA, UAMC), "FLORIDA: Broward Co., Hugh Taylor Birch St.Park 23-III-2012 M. DaCosta, J. Garcia, Lindgren funnel trap w/ETOH"; 2 (FSCA, USNM), "FLORIDA: Broward Co., Ft. Lauderdale, 3-I-2007 Coll.: M. Meadows, Lind-gren Funnel Trap w/ETOH"; 1 (INHS), "FLORIDA: Broward Co., Dania Beach, Secret Woods Nature Center, 11-V-2012, M. DaCosta, J. Garcia Lindgren funnel trap"; 2 (FSCA, BMNH), "FLORIDA: Broward Co., Ft. Lauderdale, New River Marina, 26.08630, -81.18332 1-V-2012 M. Dacosta, Lindgren funnel trap"; 1 (FSCA), "FLORIDA: Broward Co., Ft. Lauderdale, New River Marina, 9-V-2012, M. DaCosta, J. Garcia, Lindgren funnel trap, w/ ETOH"; 2 (FSCA, BPBM), "FLORIDA: Broward Co., Ft. Lauderdale, New River Marina 12-VI-2012 M. DaCosta, J. Garcia Lindgren funnel trap"; 1 (FSCA), "FLORIDA: Broward Co., Dania Beach, 19-XI-2013, M. DaCosta, J. Garcia, Lindgren Funnel trap"; 1 (FSCA), "FLORIDA: Broward Co., Ft. Lauderdale, 25-II-2010, K. Griffiths & A. Derksen, Lingren funnel trap w/ ETOH"; 1 (FSCA), "FLORIDA: Dade Co., Miami, 25.45285 -80.52865, 21-II-2011, P. Perez, lindgren/ manuka"; 1 (FSCA), FLORIDA: Dade Co. Homestead, Navy Wells Pineland Preserve, 23-II-2012 A. Derksen, Lindgren funnel trap"; 1 (FSCA), "FLORIDA: Dade Co. Homestead, Navy Wells Pineland Pres. 3-I-2012, A. Derksen, Lindgren Funnel trap"; 2 (INHS, USNM), FLORIDA: Dade Co. Homestead, Navy Wells Pineland Preserve 3-V-2012 A. Derksen Lindgren funnel trap"; 1 (FSCA), "FLORIDA: Miami-Dade Co. Homestead; Jct. SW 272 St + SW 159 Ave; 4-MAR-2011 25.51351, -80.44906 A. Derksen, P. Skelley, bark of avocado logs/branches"; 1 (FSCA), "FLORIDA: Miami-Dade Co. Homestead, 12-VIII-2009 R. Duncan & Bienvenido Ref. #47-09, ex., *Persea americana* - wood"; 2 (FSCA, BPBM), "FLORIDA: Miami-Dade Co. Homestead, 12-MAR-2014 J. Farnam, cut down Sakatentia liukioensis; E2014-1569"; 2 (KESC), "Florida: Miami-Dade Co., Redland 184th & 197th, September 10, 2015, in dry fruit of *Chrysophyllum oliviforme*, Kyle E. Schnepp", 1 (FSCA), "FLORIDA: Dade Co., Miami, 20-VI-2010, coll.: B. Saunders, Lindgren funnel trap w / phoebe oil"; 1 (FSCA), "FLORIDA: Dade Co., Miami, 6-VIII-2009, J. Dowling, W. Thiel, *Persea americana*"; 1 (FSCA), "FL: Highlands Co. Archbold Bio. St. 1-III-22-III-03 Leg. R. Beiriger Flight intercept trap"; 2 (FSCA), "FL: Palm Beach Co. Loxahatchee 5-20-IV-03 Leg. R. Beiriger Alcohol trap"; 1 (FSCA), "Florida, Palm Beach Co., Wellington, Scribner Lane April 26, 2017 Vince Golia Black Light". All paratypes have the following additional label: "[on yellow] PARATYPE *Leptophloeus barbarus* Thomas and Schnepp 2021".

Etymology. The species epithet is derived from the Latin word for "foreign" or "strange".

Discussion. Most of the specimens recorded here were collected during widespread surveying for the redbay ambrosia beetle (RAB), *Xyleborus glabratus* Eichhoff (Curculionidae: Scolytinae), using Lindgren funnel traps baited with various lures. The surveys, conducted by the Florida Department of Agriculture's Division of Plant Industry and the Cooperative Agricultural Pest Survey, were to track the spread of the exotic invasive RAB down the Florida peninsula toward the economically valuable avocado (*Persea americana* Mill.; Lauraceae) groves in the southern part of Miami-Dade County.

Leptophloeus glacialis Thomas and Schnepp, new species

Figures 3, 16

Diagnosis. Adults can be distinguished from other congeners in the United States by the combination of the following character states: the truncate epistome separates this species from *L. peregrinus* where the epistome is emarginate. The bursa copulatrix is externally evenly rounded with an acute tip (Fig. 3), while it is angulate medially, broadly rounded apically, or extremely thin and elongate in all other species. Additionally, conspicuous dorsal pubescence can help to distinguish this species.

Description, holotype female. Length 2.3 mm; elongate, parallel-sided; dorsal surface dark testaceous, not shiny; mouthparts, legs and antennae paler; conspicuously pubescent.

Head: Width across eyes 1.4× length; surface moderately punctate, punctures elongate, about the size of an eye facet, separated mostly by about 1 diameter, each puncture subtending a subdepressed, pale seta with length 2–3× the width of the puncture; surface between punctures lightly microreticulate, slightly glossy. Labrum large and conspicuous, truncate anteriorly; epistome over labrum truncate; mandibles prominent. Base of head with a well-marked occipital line. Eyes about 0.4× length of head, rather flat. Antennae short, attaining about middle of pronotum; ratios of antennomeres: 1.0, 0.9, 0.7, 0.6, 0.6, 0.6, 0.6, 0.6, 0.9, 0.9, 1.3.

Thorax: Pronotum quadrate; widest just behind apical angle; anterior angles obtuse, not produced; hind angles right, not produced; punctation, surface sculpture, and pubescence similar to head. Elytra 1.9× longer than wide; cells complete. Tarsal formula, 5-5-5.

Female genitalia: Bursa copulatrix (Fig. 3) small, fish hook type, very similar to that of *L. angustulus* (Fig. 1), but differs in having a notch on the inner face of the shank. Also similar to *L. shoshone* (Fig. 6) but differs by having the apex evenly rounded.

Variation. The only variation observed among individuals of this species was body length, with paratypes ranging from 2.0–2.3 mm. The male is unknown so that the extent or presence of sexual dimorphism is unknown.

Distribution. Known only from 3 female specimens collected on the Kenai Peninsula of Alaska.

Materials examined. Holotype: Female, deposited in UAMC, with following label data: "USA: Alaska, Kenai Mountains. Alpine saddle 1km west of Cottonwood Creek and 4km south of Ski-lak Lake. 60.35152°N 150.30032°W ±10m 18-26.Jun.2004. John M Morton, Elizabeth Jozwiak. Lynx hair snagging pad baited with catnip. KNWR: Ento: 7945 KNWRC1507 [barcode]" / "[on red] HOLOTYPE *Leptophloeus glacialis* Thomas and Schnepp 2021".

Paratypes. Total = 2, as follows: 1 (UAMC), "USA: ALASKA: Sterling, Corey St el. 90 m, 60.53953°N, 150.83232°W ±150m Picea glauca, 18APR 2004 D.M. Collet, 6239" / "UAM100247149 [barcode]"; 1 (FSCA), same data, except date is "22JUN 2005" and last number is "6868" / "UAM100041608 [barcode]" / "Cucujidae Laemophloeinae? Cryptolestes? det. ML Bouser 9-Feb-2005" [in pencil on yellow folded paper]. All paratypes have the following additional label: "[on yellow] PARATYPE *Leptophloeus glacialis* Thomas and Schnepp 2021".

Etymology. The species epithet is derived from the Latin for "icy, frozen".

Discussion. This is only the second indigenous laemophloeid known from Alaska. The other indigenous species is *Laemophloeus shastanus* Casey, 1916 which occurs south to central California (Thomas 2015). Two species previously listed for Alaska have been shown to be synonyms: *Laemophloeus longicornis* Mannerheim, 1843 is a junior synonym of the European *Cryptolestes pusillus* (Schönherr, 1817), and *Trogosita pusillima* Mannerheim, 1843 is a junior synonym of *Holoparamecus depressus* Curtis, 1833 (Endomychidae) (Shockley and Thomas 2015).

Leptophloeus peregrinus Thomas and Schnepp, new species

Figures 5, 8, 13, 17

Diagnosis. Adults can be distinguished from other congeners in the United States by the combination of the following character states: distinctly emarginate epistome and clypeus and acute anterior clypeal angles (Fig. 13) in both sexes is unlike that of any other known species in the United States (Fig. 11–12). Tarsomeres 1–3 with ventral setae twice as long as tarsomere, in all other species the setae are as long as or barely longer than the source tarsomere. The female and male genitalic characters are also useful.

Description, holotype female. Length 2.0 mm; elongate, parallel-sided; dorsal surface dark testaceous, smooth and shiny; mouthparts, legs and antennae paler.

Head: Width across eyes 1.7× length; surface moderately punctate, punctures elongate, smaller than eye facet, separated by 1–2× their diameter, each subtending an erect pale, inconspicuous seta about as long as a puncture; microsculpture composed of lightly impressed longitudinal lines scattered among the punctures; surface mostly smooth and glossy. Labrum large, weakly emarginate; mandibles not elongate, without a basal lobe; gena not expanded. Lateral line consisting of shallow groove bordered by a weak ridge; base of head with occipital line represented only by an irregular row of coarse punctures (Fig. 13). Epistome over labrum distinctly emarginate, strongly bordered; apico-lateral angles acute. Antennae short, attaining about basal third of pronotum; ratios of antennomeres: I, 1.6; II, 1.0; III,1.1; IV–VIII, each, 1.0; IX, 1.2; X, 1.1; XI, 1.5.

Thorax: Pronotum barely transverse, 1.1× wider than long; widest just behind apical angle; anterior angles obtuse, not produced; hind angles right, moderately produced; punctation and pubescence similar to head. Elytra 2.0× longer than wide; outer margin of first cell obsolete. Tarsal formula, 5-5-5; tarsomeres 1–3 with ventral setae twice as long as tarsomere.

Female genitalia: Bursa copulatrix (Fig. 5) is of the fish hook type, roughly resembling that of *L. angustulus* (Fig. 1) and that of the new species described below but differs in having a wide shank which is broadly rounded apically versus the narrower shank and acute apex in the two other species mentioned.

Description, allotype male. Length 2.2 mm; elongate, parallel-sided; dorsal surface dark testaceous; mouthparts, legs and antennae paler.

Head: Width across eyes 1.5× length; punctation and pubescence as in female. Labrum large, weakly emarginate; mandibles large and prominent, somewhat enlarged at the base but without a distinct basal lobe; gena somewhat expanded. Epistome over labrum emarginate; apico-lateral angles acute (Fig. 13). Antennae short, attaining about base of pronotum; ratios of antennomeres: 1.9, 1.1, 1.4, 1.0, 1.0, 1.0, 1.0, 1.0, 1.3, 1.4, 1.8.

Thorax: Pronotum barely transverse, 1.1× wider than long; widest just behind apical angle; anterior angles obtuse, not produced; hind angles right, moderately produced; punctation and pubescence as in female. Elytra 1.9× longer than wide; outer margin of first cell obsolete.

Male genitalia: The basal armature of the internal sac consists of two curved rods (Fig. 8).

Variation. Specimens range in length from 1.5–2.4 mm.

Distribution. Known only from the Hawaiian Islands of Hawaii and Oahu.

Materials examined. Holotype: Female, deposited in BPBM with following label data: "USA: Hawaii Hawaii, South Kona November 2014 in coffee berries" / "[on red] HOLOTYPE *Leptophloeus peregrinus* Thomas and Schnepp 2021". **Allotype:** Male, deposited in BPBM with following label data: "USA: HAWAII: Hawaii, MacFarms nr Manuka Nat. Area Res., 1200 ft 6.I.1998" / "MacFarms Area A, from 50 sticktight nuts from trees, coll. M. Richjardson" / "[on red] ALLOTYPE *Leptophloeus peregrinus* Thomas and Schnepp 2021".

Paratypes. Total = 81, as follows: 18 (9 BPBM, 7 FSCA, 2 USNM), same data as holotype; 7 (2, BMNH, 2, BPBM, 2 FSCA,), same data as allotype; 2 (FSCA), "HAWAIIAN IS: Hawaii I: Kau Distr.: Manuka State Park, 545 m, 9.VIII. 1981" / "Acacia" / "W.C. Gagne, Coll. BISHOP Museum Acc. #1981.602"; 27 (3 BMNH, 3 BPBM, 11 FSCA, 4 INHS, 3 UAMC, 3 USNM), "USA: HAWAII: Hawaii Kealakekua Napo'opo'o Rd. 19.48134, −155.91168 30-VI-2016 coll. E. Brill on *Leucaenia leucocephala*"; 1 (FSCA), "USA: HAWAII: Hawaii Hamakua Dist. Onomea 15-III-2016 avocado tree - Trap CBB"; 2 (FSCA), "USA: HAWAII: Hawaii Kona late 2016?"; 1 (FSCA), "USA: HAWAII: Hawaii Kaā, Caputo Coffee 26-I-2017"; 4 (FSCA), "HAWAII: Hawaii South Kona V-VII-2014 coll. by coffee farmer"; 18 (2 BMNH, 3 BPBM, 10 FSCA, 3 USNM), "USA: HAWAII: Hawaii Yamegata Farms 13-V-2015"; 1 (FSCA), "KaenaPt. OAHU HI 5 AUG 85 D G Kissinger Ocean Beach". All paratypes have the following additional label: "[on yellow] PARATYPE *Leptophloeus peregrinus* Thomas and Schnepp 2021".

Etymology. The species epithet is derived from the Latin for "traveling about".

Discussion. This species has been known to biological control workers for many years and referenced in several publications due to its predation on the coffee berry borer (*Hypothenemus hampei* (Ferrari)) and tropical nut borer (*Hypothenemus obscurus* (Fabricius)) (Curculionidae, Scolytinae: Follet et al. 2016; Sim et al. 2016; Brill et al. 2021; Aristizábal et al. 2023; Moreno-Ramirez et al. 2024). A name and description are provided here to facilitate future work with biocontrol agents.

Leptophloeus shoshone Thomas and Schnepp, new species

Figures 6, 9, 18

Diagnosis. Adults can be distinguished from other congeners in the United States by the combination of character states: truncate epistome separates this species from *L. peregrinus* where the epistome is emarginate. The bursa copulatrix is angulate medially with the apex slightly deflexed (Fig. 6), while it is evenly rounded externally or extremely thin and elongate in all other species. Additionally, conspicuous dorsal pubescence can help to distinguish this species.

Description, holotype female. Length 2.3 mm; elongate, parallel-sided; dorsal surface dark testaceous, not shiny; legs and antennae paler; conspicuously pubescent.

Head: Width across eyes 1.4× length; surface moderately punctate, punctures elongate, about the size of an eye facet, separated mostly by about 1 diameter, each subtending a subdepressed, pale seta with length 2–3×

width of the puncture; surface between punctures lightly microreticulate, slightly glossy. Labrum large and conspicuous, very broadly rounded; epistome over labrum virtually truncate; mandibles prominent. Base of head with a well-marked occipital line. Eyes about 0.4× length of head, rather flat. Antennae short, attaining about middle of pronotum; ratios of antennomeres: I, 1.0; II, 0.9; III–VIII, each 0.6; IX, 1; X, 1; XI, 1.2.

Thorax: Pronotum quadrate; widest just behind apical angle; anterior angles obtuse, not produced; hind angles right, not produced; punctation, surface sculpture, and pubescence similar to head. Elytra 2× longer than wide; cells complete. Tarsal formula, 5-5-5.

Female genitalia: Bursa copulatrix (Fig. 6) small, fish hook type, very similar to that of *L. angustulus* (Fig. 1), but differs in having a notch on the inner face of the shank. Also similar to *L. glacialis* (Fig. 3) but differs by having the apex straight with a slight notch externally.

Description, allotype male. Length 2.2 mm; elongate, parallel-sided; dorsal surface testaceous; mouthparts, legs and antennae paler.

Head: Width across eyes 1.3× length; punctation and pubescence as in female. Labrum large, very broadly rounded; mandibles large; gena somewhat expanded. Epistome over labrum slightly emarginate; apico-lateral angles slightly acute. Antennae short, attaining just past middle of pronotum; ratios of antennomeres: 1.3, 1.2, 1.1, 1.0, 1.0, 1.0, 1.0, 1.0, 1.1, 1.1, 1.3.

Thorax: Pronotum quadrate, as wide as long; widest just behind apical angle; anterior angles obtuse, not produced; hind angles right, not produced; punctation and pubescence as in female. Elytra 2× longer than wide. Tarsal formula, 5-5-4.

Male genitalia: The basal armature of the internal sac consists of two rods, the external one broadly arcuate, the interior one squarely angulate (Fig. 9).

Variation. Specimens range in length from 2.0–2.6mm. Males can be distinguished by their 5-5-4 tarsal formula.

Distribution. Only known from Wyoming, U.S.A. at elevations around 8,000 feet; the species is likely more widely distributed.

Materials examined. Holotype: Female, deposited in the FSCA, with following data: "USA WY Fremont Co; Shoshone NF; Willow Crk, N 42 29.616 W 108 48.871, el 8283; Limber pine #125, 7-11 2016 exclu bolt 7; ex 2017, L. Haimowitz" / "[on red] HOLOTYPE *Leptophloeus shoshone* Thomas and Schnepp 2021". **Allotype:** Male, in FSCA, with following data: "USA WY Albany Co Med Bow, Nat'l For. Pole Mountain; limber pine infested with mpb in 2015; N 41° 15.026'; W 105° 26.407", "Canopy Trap West; 7/17 to 7/24, 2016; col'rs A. Harris and L. Haimowitz" / "[on red] ALLOTYPE *Leptophloeus shoshone* Thomas and Schnepp 2021".

Paratypes. Total = 48, as follows: 30 (3 BMNH, 3 BPBM, 14 FSCA, 3 INHS, 3 UAMC, 4 UWIM), same data as allotype; 18 (11 FSCA, 3 USNM, 4 UWIM), "USA WY Fremont Co; Shoshone NF; Slate Creek; N 42 31.531 W 108 48.010, el 7954 emer trp ex limber Pine #123 mpb infstd 2015, Col 7/24/2016 L Haimowitz"; (paratypes deposited in BMNH, BPBM, FSCA, UAMC, USNM, UWIM). All paratypes have the following additional label: "[on yellow] PARATYPE *Leptophloeus shoshone* Thomas and Schnepp 2021".

Etymology. The species epithet comes from the Shoshone National Forest and is a noun in apposition.

Discussion. Specimens recorded here were collected during a survey of insects from mountain pine beetle infested limber pine through a variety of methods, including flight intercept traps and emergence traps on the trunks of infested trees.

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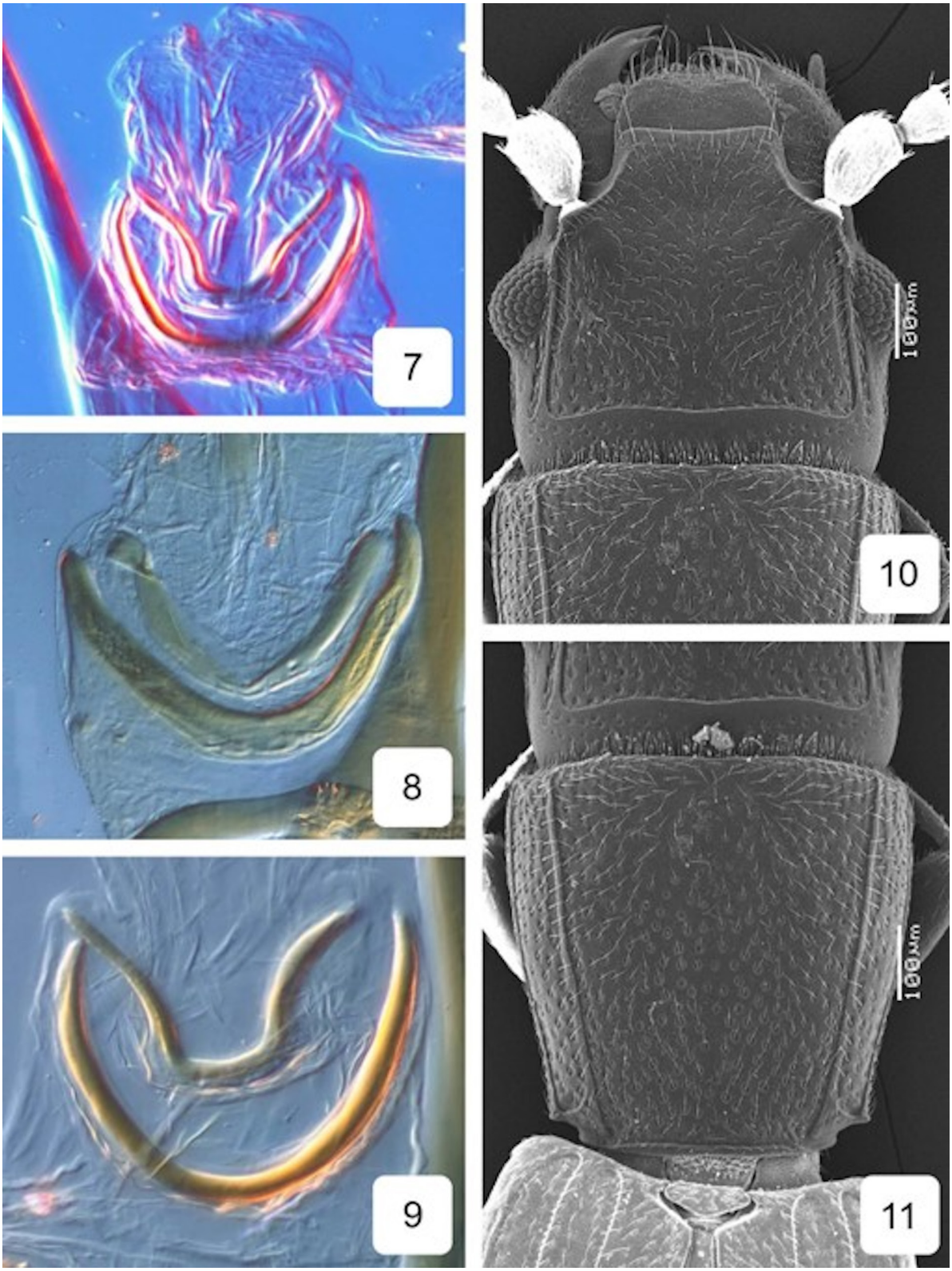
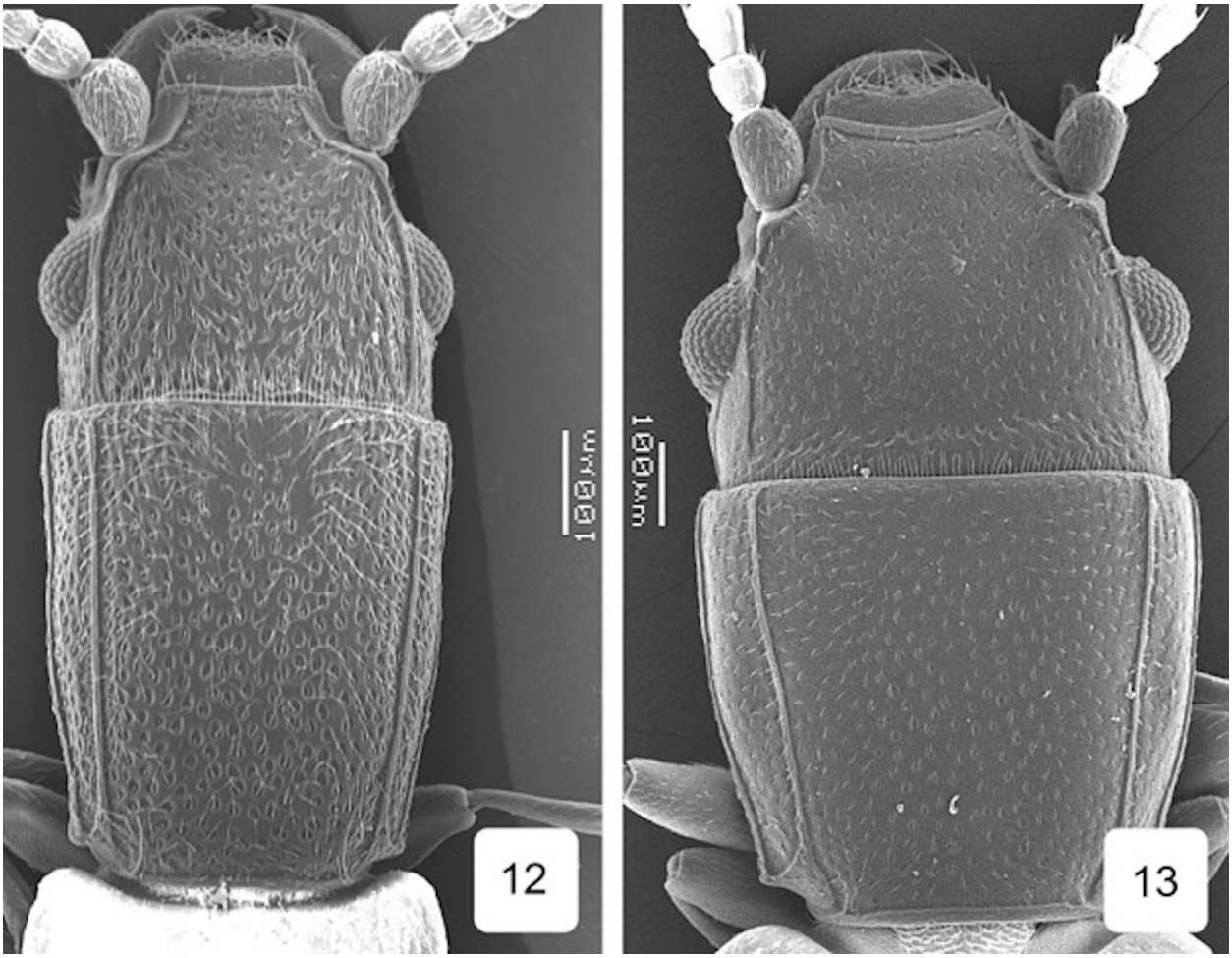
Figures 1–6. Female bursa of *Leptophloeus* species occurring in the United States. **1)** *Leptophloeus angustulus*. **2)** *Leptophloeus barbarus*. **3)** *Leptophloeus glacialis*. **4)** *Leptophloeus juniperi*. **5)** *Leptophloeus peregrinus*. **6)** *Leptophloeus shoshone*.



Figures 7–11. *Leptophloeus* species. **7)** *Leptophloeus barbarus*, male, basal armature of the internal sac. **8)** *Leptophloeus peregrinus*, male, basal armature of the internal sac. **9)** *Leptophloeus shoshone*, male, basal armature of the internal sac. **10)** *Leptophloeus barbarus*, male, head. **11)** *Leptophloeus barbarus*, male, pronotum.



Figures 12–13. Head and pronotum of *Leptophloeus* species. **12)** *Leptophloeus angustulus*, male. **13)** *Leptophloeus peregrinus*, male.

Figures 14–17. Dorsal habitus of *Leptophloeus* species. **14)** *Leptophloeus angustulus*. **15)** *Leptophloeus barbarus*, holotype. **16)** *Leptophloeus glacialis*, holotype. **17)** *Leptophloeus peregrinus*, holotype.

Figure 18. Dorsal habitus of *Leptophloeus shoshone*, holotype.