

April 1979

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### Recommended Citation

Wooldridge, David P. 1979. "New World Limnichinae IV. *Eulimnichus* Casey. B. Descriptions of New Species (Coleoptera: Limnichidae)," *The Great Lakes Entomologist*, vol 12 (1)

DOI: <https://doi.org/10.22543/0090-0222.1349>

Available at: <https://scholar.valpo.edu/tgle/vol12/iss1/1>

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NEW WORLD LIMNICHINAE IV. *EULIMNICHUS* CASEY. B.  
 DESCRIPTIONS OF NEW SPECIES (COLEOPTERA: LIMNICHIDAE)

David P. Wooldridge<sup>1</sup>

ABSTRACT

Thirteen new species of *Eulimnichus* are described: *Eulimnichus visendus*, *corrinae*, *langleyae*, *coheni*, *improcerus*, *pellucidus*, *sharpi*, *incultus*, *rugulosus*, *rusticus*, *acutus*, *subitus*, and *spangleri*. A key to the 27 known species is included.

In part A of this paper the genus *Eulimnichus* was recharacterized, the species redescribed, and various taxonomic problems resolved. In this paper, 13 new species are described bringing the total of known species to 27. A key for their separation is included.

The following abbreviations are used to indicate the disposition of type material: CAS, California Academy of Sciences, San Francisco; CISC, California Insect Survey, Berkeley; DPWC, types retained in the author's collection; HPBC, Dr. Harley P. Brown, Stoval Museum, University of Oklahoma, Norman; INHS, Illinois Natural History Survey, Urbana; JSCC, Joe Schuh Coll., Klamath Falls, Oregon; MCZ, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; TAMU, Texas A & M University, College Station; USNM, U.S. National Museum, Washington, D.C. (Specimens designated EPCSI or indicated with an asterisk are part of the Ecuador-Peace Corps-Smithsonian Institution Aquatic Insect Survey.); UWEM, University of Wisconsin, Madison.

In the following descriptions separations of the punctures are indicated by figures in parentheses. For example, (1-2X) indicates that the punctures are separated by one to two times their own diameters. The transverse row of punctures on the pronotum refers to a series of punctures just behind the middle on the disk of the pronotum. This series, very irregular in development, often curves back toward the hind margin of the pronotum, but may be much shorter and nearly straight. Its various stages of development are illustrated in Part A of this paper (Wooldridge, 1978).

*Eulimnichus visendus* new species

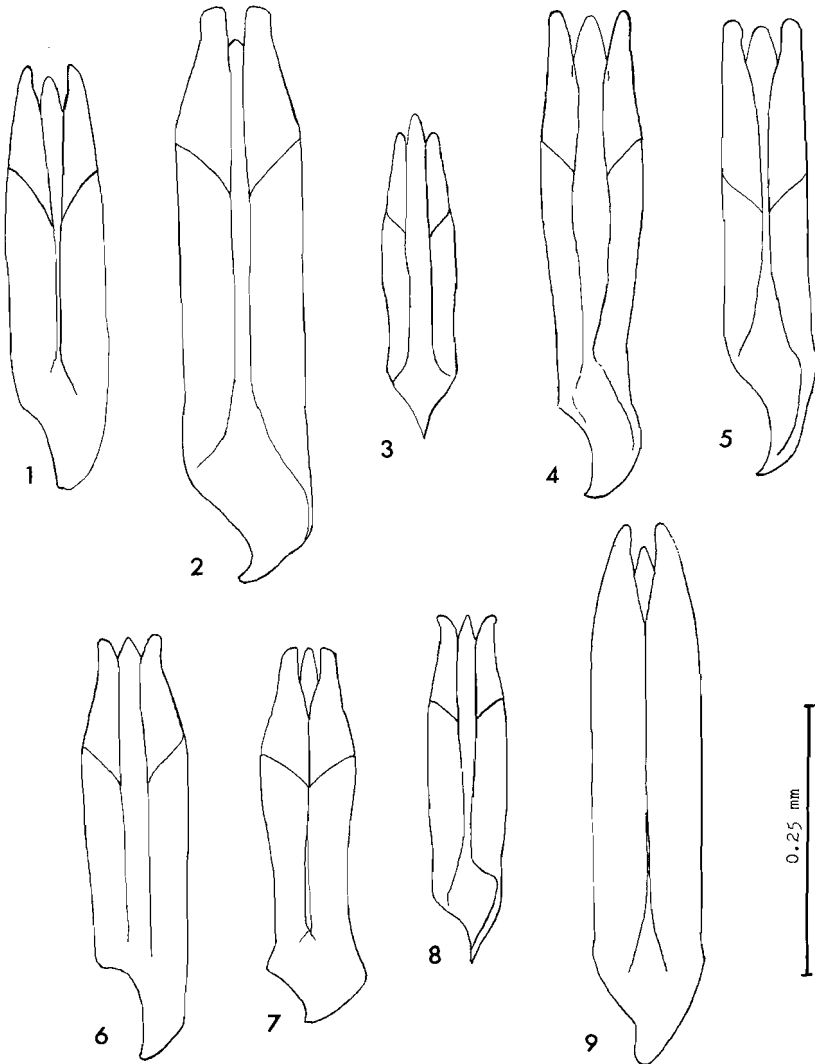
HOLOTYPE: Male. Mexico, Tamaulipas, Gomez Farias, Nacimiento del Rio Frio, 29.VI.1969, black light, S. & J. Peck (INHS). Length 1.75 mm. Width 1.1 mm. Elongate-oval. Black. Head with sides of front with a very slight notch at ends of the epistomal suture, surface somewhat depressed behind notch; sculpture longitudinally coalescent to vertex; pubescence suberect in grooves. Pronotum shining; punctuation fine, barely impressed, moderately close (2-3X); transverse series absent; pubescence long, about two times as long as distance between punctures. Elytra shining; punctuation fine, about like pronotum but slightly more impressed; pubescence long, erect. Epipleura slightly concave; shining; finely punctate. Prosternum with fine, close punctures. Hypomera shining; finely evenly punctate; outer anterior angles prolonged into an acutely pointed, broad spine. Metasternum with close, perforate punctures at sides, punctures slightly finer and more distant at midline; punctures of posterior row nearly touching; surface slightly depressed behind posterior row. Abdomen finely, sparsely punctate at midline, punctures more marked at sides; surface shining; last sternum more closely

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punctate; central triangle small but well marked. Aedeagus with broad based parameres with inner margins tapering to a narrowly rounded tip that is about the same width as the tip of the penis (Fig. 1).

ALLOTYPE: Female. Same data as male. Externally identical to male, except central triangle of last abdominal sternum not as impressed.

PARATYPES; MEXICO: 1 female, San Luis Potosi, Clear Stream at Palitla, 5 mi N of Tamazunchale, 22.XII.1948, Hugh B. Leech (CAS); 1 male, 7 females. Same data as holotype (INHS, except 2 females DPWC).



Figs. 1-9. Male genitalia, dorsal view. 1, *Eulimnichus visendus*. 2, *langleyae*. 3, *coheni*. 4, *sharpi*. 5, *incultus*. 6, *rugulosus*. 7, *acutus*. 8, *subitus*. 9, *spangleri*.

*Eulimnichus corrinae* new species

HOLOTYPE: Female. Venezuela, Guarico, 12 km S Calabozo, 6-12.11.1969, P. & P. Spangler, Est. Biologica los Llanos, black light. USNM Type No. 73404. Length 1.55 mm. Width 1.0 mm. Broadly oval. Black. Head with margins of front distinctly notched at ends of epistomal suture, not otherwise depressed; sculpture shallowly longitudinally coalescent on front, vertex with small, indistinct, moderately distant (2-4×) punctures; pubescence short and recumbent. Pronotum shining on disk, microreticulate along posterior angles; punctuation of close (1-2×), small, perforate punctures; transverse line distinct, surface depressed behind it; pubescence short, recumbent. Elytra shining; punctations shallow, indistinct, more distant than on pronotum (2-4×); surface slightly ridged between punctures; pubescence short. Epipleura flat, dull, minutely punctate. Prosternal punctuation fine and shallow. Hypomera microreticulate, finely, minutely punctate, anterior angles not produced; outer margin evenly curved. Metasternum very minutely, closely punctate; surface dull to faintly shining; posterior row present only on middle half, composed of punctures only slightly larger than others on metasternum. Abdomen very dull; closely, minutely punctate; last sternum with some larger punctures along outer margins; central triangle slightly impressed.

Male: Unknown.

PARATYPES: ARGENTINA: 1 female, Tucuman, Harrington (MCZ). BRAZIL: Para.: 1 female, Santarem, 1963, F. G. Werner (MCZ); 1 female, Rio Zinha (Xingu Trib), 10/6/68, H. Brown (HPBC). VENEZUELA: Guarico: 167 females, same data as holotype (USNM, except 15 DPWC); 20 females, Calabozo, 7.II.1969, P. & P. Spangler, collected in Lago de Los Patos (USNM); 3 females, 15 km S Calabozo, 9-13.II. 1969, P. & P. Spangler (USNM). Portuguesa: 3 females, Guanare, 10-13.IX.1967, Borys Malkin (CAS).

This species is named in honor of my wife, Corrine, who has tirelessly helped with my record keeping, curating, and manuscript typing.

*Eulimnichus langleyae* new species

HOLOTYPE: Male. Ecuador, Napo, Lago Agrio (18 km E) Rio Aguarico, 23 Sept., 1975, Andrea Langley, (EPCSI), USNM Type No. 73405. Length 2.25 mm. Width 1.40 mm. Broadly oval. Black. Head with margins of front notched at the ends of the epistomal suture; sculpture deeply longitudinally coalescent to vertex; punctures fine and close (1-2×) on vertex; pubescence short, recumbent in grooves. Pronotum shining, becoming faintly alutaceous at sides; punctuation fine, perforate, close (~2×); transverse line marked only at midline; midline depressed; pubescence long, recumbent. Elytra shining; punctuation small, barely impressed but distinct, close (1-3×), becoming more impressed at sides and apex; surface slightly ridged between punctures; pubescence short, erect, recurved. Epipleura shining to faintly alutaceous; punctuation like elytra. Prosternal punctuation fine, unimpressed, not very noticeable, especially at sides. Hypomera microreticulate, punctuation minute; inner and outer margins nearly straight; anterior outer angle rounded. Metasternum with close (< 1×) even, perforate, slightly impressed punctures at sides, punctures more distant but no smaller at midline; posterior row of punctures forming a groove from side to side; surface depressed behind posterior row. Abdomen dull, with very minute, dense punctuation; punctures becoming larger and somewhat coalescent at sides; last sternum with larger and coarser punctures at sides and apex; central triangle deep and densely pubescent. Aedeagus with parameres blunt and broad at tips. Penis broad, tapering to a bluntly rounded tip (Fig. 2).

ALLOTYPE: Female. Same data as male. Externally identical to male, except triangle of last sternum slightly smaller and not nearly as impressed.

PARATYPES: ECUADOR: Napo: 65 males, 63 females, Same data as holotype (USNM, except 3 males, 1 female DPWC)\*; 3 females, Lago Agrio, 19 Sept., 1975, at blacklight, Andrea Langley (USNM)\*; 1 female, 7 km N Lago Agrio, 27 Sept., 1975 Andrea Langley (USNM)\*; 17 males, 62 females, 18 km E Lago Agrio, 28-30 Aug., 1975 at Rio Aguarico, Langley, Cohen, Cantor, & Yingling (USNM)\*; 7 males, 11 females, 1 km S Lago Agrio, 22 Aug., 1975, Andrea Langley (USNM)\*; 23 males, 22 females, Sta

Cecilia, 16 May, 1975, Spangler, Gurney, Langley & Cohen (USNM, except 1 male, 4 females DPWC)\*; 1 male, ca. Shushufindi, 21 Sept., 1975, Langley & Cohen (USNM)\*.

This species is named in honor of Andrea Langley, who, while a volunteer in the Peace Corps in Ecuador, collected large numbers of insects for the U.S.N.M.

*Eulimnichus coheni* new species

**HOLOTYPE:** Male. Ecuador, Los Rios, Quevedo, 11 May, 1975, at blacklight, (EPCSI). USNM Type No. 73831. Length 1.85 mm. Width 0.90 mm. Ovate, broadest behind middle. Black. Head with front deeply notched at ends of epistomal suture; punctuation close (1-2X), perforate; sculpture of front not coalescent; pubescence long, recumbent. Pronotum shining, even at posterior angles; punctuation fine, perforate, close (2-3X); transverse row of punctures well marked, surface depressed behind it; midline impressed; pubescence recumbent, sparse. Elytra shining; punctuation fine, slightly perforate, barely impressed; pubescence short. Epipleura flat, alutaceous, densely punctate. Prosternal punctuation fine, indistinct. Hypomera narrow, microreticulate with fine, even punctuation; outer margin gradually, evenly curved. Metasternum with fine, unimpressed punctures that become slightly more impressed at sides, closer (1-2X) and distinct only at sides; posterior row of punctures small and nearly contiguous. Abdomen alutaceous but faintly shining; punctuation fine, close (1-2X) but not impressed; central triangle of last sternum well marked. Aedeagus with slender parameres shorter than narrowly tapering, rounded tip penis (Fig. 3).

**ALLOTYPE:** Female. Same data as holotype. Externally identical to male, except last sternum without an impressed central triangle but with a small triangle of dense pubescence.

**PARATYPES:** BOLIVIA: L.P.: 1 female, 24 km W Coripata, 2-6.V.1969, P. & P. Spangler (USNM). ECUADOR: Cotopaxi: 2 males, 13 females, 133 km W Latacunga, 2 July, 1975, Andrea Langley & Jeffrey Cohen (USNM)\*; Los Rios: 16 males, 81 females, same data as holotype (USNM, except 8 DPWC)\*; Manabi: 1 male, Camarones, 9 Sept., 1955, Levi Castillo (USNM).

This species is named in honor of Jeffrey Cohen, a Peace Corps volunteer, who collected large numbers of insects for the U.S.N.M. during his tour in Ecuador.

*Eulimnichus improcerus* new species

**HOLOTYPE:** Female. Drac. (Probably Dracut, Mass.) Ice. 3/6-86, Frederick Blanchard Collection (MCZ). Length 1.7 mm. Width 1.15 mm. Oval, very convex. Black. Head with margins of front notched at ends of epistomal suture and depressed just behind the notch; sculpture of front coarsely longitudinally coalescent, vertex normally punctate, punctures shallow, fairly close (2-3X); pubescence recumbent, short. Pronotum shining; punctuation shallow, well separated (3-5X); transverse row faintly marked; midline impressed behind transverse row; pubescence short, sparse, recumbent. Elytra shining to faintly alutaceous; punctuation shallow, broad, separated by two to three times their diameters; pubescence sparse, short, recumbent. Epipleura flat, depressed at anterior inner angle; shining, minutely punctate. Prosternal punctuation small, not impressed, Hypomera shining at sides, faintly microreticulate in center; angles rounded, inner and outer margins straight and fairly parallel; punctuation indistinct except along inner margin. Metasternum shining to slightly alutaceous at sides; punctuation small, mostly perforate, fairly close (2-3X), becoming slightly more distant at midline; posterior row of punctures well marked but punctures separated by one to two times their diameters. Abdomen microreticulate, punctures barely impressed and distant at midline, slightly more marked at sides; last sternum with a small slightly more densely punctate area at center of posterior margin.

Male: Unknown.

**PARATYPES:** 1 female, Same data as holotype; 1 female, Mass., Brookline 9.5.91 (MCZ).

*Eulimnichus pellucidus* new species

HOLOTYPE: Female. Venezuela, Portuguesa, Guanare, 26.II.1969, P. & P. Spangler. USNM Type No. 73832. Length 2.3 mm. Width 1.35 mm. Broadly ovate, widest just before middle. Black. Head with margins of front slightly notched at ends of epistomal suture; sculpture finely longitudinally coalescent to vertex; punctuation of vertex fine; punctuation long, recumbent in grooves. Pronotum shining; punctuation fine, perforate, fairly close (2-3×); transverse row of punctures distinct; surface depressed behind transverse row, especially near midline, pubescence long, recumbent. Elytra dull on disk, more shining at sides; punctuation fine, distinct but not impressed, distant (2-4×); pubescence moderately long on disk, shorter at apex. Epipleura fairly flat, alutaceous, punctured about like elytra. Prosternal punctuation fine, not impressed. Hypomera microreticulate; punctuation distinct, deeper along inner margin; anterior outer angle rounded; outer margin evenly curved. Metasternum shining in center, slightly microreticulate at sides; punctuation small, even, and fine, distant (3-6×); posterior row of punctures slightly more impressed than other metasternal punctures. Abdomen microreticulate; punctuation very fine and shallow, becoming very slightly larger at sides; last sternum more coarsely punctate with a small, nearly circular depressed area near the posterior margin.

Male: Unknown.

PARATYPES: VENEZUELA: Guarico: 2 females, 12 km S Calabozo, 6-12.II.1969, P. & P. Spangler (USNM); Portuguesa: 3 females, same data as holotype.

*Eulimnichus sharpi* new species

HOLOTYPE: Male. Mexico, Nayarit, San Blas. 28.IX.1961 C. O. Morse (CAS). Length 2.3 mm. Width 1.5 mm. Broadly oval. Black. Head with margins of front notched as ends of epistomal suture; sculpture finely longitudinally coalescent to vertex; punctuation close, perforate and somewhat polygonally crowded on vertex; pubescence short, recumbent in grooves. Pronotum shining; sides depressed, appearing explanate from above; punctuation perforate and close (1-2×) at sides, slightly finer on disk; transverse row of punctures visible only at midline which is impressed behind it; pubescence fairly long, dense. Elytra shining to slightly alutaceous; punctuation round, perforate, not at all impressed, close (1-2×); pubescence short, especially at sides and apex, dense. Epipleura flat, microreticulate, very finely punctate. Prosternal punctuation perforate, close (2-3×). Hypomera microreticulate with close, impressed punctures; very broad and flat with outer margins strongly, evenly curved. Metasternum shining; punctuation of two sizes: very minute perforate punctures and larger, distinct perforate punctures, both evenly scattered; posterior row of punctures very close and impressed, forming a groove; surface depressed behind posterior row. Abdomen finely, closely punctate, punctures slightly coalescent at sides; last sternum with a large depressed, central pubescent area that is somewhat heart-shaped with the apex toward the posterior. Aedeagus with tips of parameres rounded and slightly diverging. Penis tapering to a narrowly rounded tip (Fig. 4).

ALLOTYPE: Female. Same data as holotype. Externally identical to the male, except last sternum with only a slightly more densely pubescent central triangle that is not deeply depressed.

PARATYPES: MEXICO: 1 female, May, Barrett (CAS). Jalisco: 4 females, Las Barrancas, 3.1923, W. M. Mann (USNM). Morelos: 1 male, 1 female, Cuernavaca, 14.XII.1907, Koebele Coll. (CAS); 4 females, Cuernavaca, 1898, Frederick Allan Eddy Coll. (MCZ); 1 male, Cuernavaca, V.1945, N. L. H. Krauss (USNM). Nayarit: 1 male, 2 females, same data as holotype (CAS); 5 females, Acaponeta, 15.VII.1960, P. H. Arnaud, Jr., E. S. Ross, D. C. Rentz (CAS); 1 male, 1 female, Ixtlan del Rio, 22.IX.53, B. Malkin (CAS); 1 female, San Blas, 3.VII.1964, P. J. Spangler (USNM); 4 males, 5 females, San Blas, 17-21.IX. 53, B. Malkin (CAS); 1 female, 19 mi SE Tepic, 27.XI.1948, Hugh B. Leech (CAS). Puebla: 1 male, 9 mi N of Amatitlan, 10.XII.48, H. B. Leech (CAS). Sinaloa: 3 males, 3 females, 10 mi S Rosario, 22.VI.57, at light, J. A. Chemsak, B. J. Rannelis (CISC).

I take pleasure in naming this species for Dr. David Sharp, a pioneer in the study of Central American fauna.

*Eulimnichus incultus* new species

**HOLOTYPE:** Male. Ecuador, Napo, Lago Agrio (18 km E), Rio Agarico, 23 Sept., 1975, Andrea Langley (EPCSI). USNM Type No. 73833. Length 2.1 mm. Width 1.25 mm. Narrowly oval. Black, except femora and epipleura red-brown. Head with margins notched at the ends of the epistomal suture; sculpture longitudinally coalescent into distinct, fine grooves nearly to vertex; pubescence short, recumbent in grooves. Pronotum shining on disk, strongly microreticulate at sides; punctation fine, indistinct, very lightly impressed; no transverse row of punctures; pubescence short, recumbent. Elytra shining to faintly alutaceous; punctures fine, indistinct, lightly impressed, close (1-3×), becoming more impressed and larger at sides and apex; pubescence short. Epipleura slightly depressed, vaguely alutaceous, finely punctate. Prosternal punctures fine, indistinct. Hypomera flat, microreticulate; punctation small but distinct; inner and outer margins nearly parallel, outer margin very slightly curved; anterior angles nearly rectangular. Metasternum with fine, close (1-2×) punctation at sides, becoming finer and more distant at the impressed midline; posterior row of punctures deeply impressed and contiguous except near midline. Abdomen alutaceous; punctation fine, minute, slightly coarser at sides; last sternum more coarsely punctate with central triangle large, covering nearly one-half sternum, depressed, densely pubescent. Aedeagus with sides of parameres nearly parallel until just behind the slightly bulbous, rounded tips. Penis narrowing just before the broadly rounded tip (Fig. 5).

**ALLOTYPE:** Female. Same data as holotype. Externally identical to the male, except central triangle of last sternum smaller and not as depressed.

**PARATYPES:** BOLIVIA: 3 males, 12 females, Covendo, Aug. W. M. Mann, Mulford Biol. Exp. 1921-22 (USNM), 1 female, same data except Sept. (USNM); 1 female, Beni, August, 1925, G. L. Harrington (USNM); 1 female, nr. Mouth R. Mapiri, Sept., 1921, Wm. M. Mann, Mulford Biol. Exp. 1921-2 (USNM). ECUADOR: Napo: 5 males, 13 females, same data as holotype (USNM)\*; 3 males, 7 females, same data except 28 Aug., 1975, Langley, Cohen, Cantor, Yingling (USNM, except 1 male, 1 female DPWC)\*. Pastaza: 2 males, 1 female, 16 km W. Puyo, 3 Feb., 1976, Spangler, et al. (DPWC)\*.

I have also seen three specimens from Brazil which I place in this species but which differ from all others in having the legs entirely black.

*Eulimnichus rugulosus* new species

**HOLOTYPE:** Male. Illinois, Lake Co., Ill. Beach St. Pk., 25 June, 1972. M. W. Sanderson, Sand pool nr. Lake Michigan (INHS). Length 1.75 mm. Width 1.1 mm. Elongate oval. Black. Head with margins of front depressed above antennal bases, but not notched; sculpture deeply longitudinally coalescent to vertex; pubescence short, recumbent in grooves. Pronotum shining on disk, strongly microreticulate at sides; punctation distinct, perforate, well separated (3-5×); transverse row not marked; midline impressed in posterior one-half; pubescence short, recumbent. Elytra very microreticulate; punctation lightly impressed but distinct, well separated (3-5×); pubescence short. Epipleura microreticulate, punctation indistinct. Prosternal punctation perforate, close (1-2×). Hypomera microreticulate, finely punctate; outer margin fairly straight to slightly curved; front margin narrow, outer anterior angle somewhat angulate. Metasternum shining; punctation perforate, especially at sides, becoming finer at center, distant (5-7×); midline depressed; posterior row of punctures fine and distant, with a few slightly larger, coarser punctures behind it. Abdomen alutaceous, finely distantly punctate, punctures slightly coarser and closer at sides; central triangle of last sternum vaguely marked with close, very coarse punctures; not really depressed. Aedeagus with tips of parameres strongly diverging from the broad, but acutely pointed penis (Fig. 6).

**ALLOTYPE:** Female. Same data as holotype. Externally identical to male, except last sternum without triangle of close, coarse punctures.

PARATYPES: D.C.: 1 female, no other data (INHS). Illinois: 1 female, no other data (INHS); Lake Co.: 7 males, 14 females, Same data as holotype (INHS, except 1 male, 2 females, DPWC). Michigan: 1 male, 2 females, Shiawassee Co., 4 June, 1967, T. Schuh (JSCC). Wisconsin: 1 female, no other data (INHS); Dane Co. 1 female, 10 May, 1898, Wm. S. Marshall (UWEM).

*Eulimnichus rusticus* new species

HOLOTYPE: Female. Mexico. Baja California, 3 mi NW of Miraflores, 19.I.1959, Canon San Bernardino, Boca de la Sierra, H. B. Leech (CAS). Length 1.9 mm. Width 1.1 mm. Narrowly oval. Black. Head with margins of front deeply depressed above antennal bases but not notched; sculpture of head coarsely longitudinally grooved to vertex; pubescence sparse, recumbent in grooves. Pronotum shining on disk, microreticulate at sides; punctation fine, distant (5-7 $\times$ ); transverse row of punctures distinct at midline and sides but interrupted between; surface slightly depressed and midline impressed behind transverse row; pubescence sparse, long. Elytra shining but faintly microreticulate; punctation fine, distant (5-7 $\times$ ); pubescence sparse, long. Epipleura shining, narrow, flat, finely punctate. Prosternal punctation fine, impressed. Hypomera microreticulate; very finely punctate; long, narrow; anterior outer angle produced into an obtuse tooth; outer margin sinuately curved. Metasternum with small, perforate, distant (3-5 $\times$ ) punctures that are even across width; midline impressed; posterior row of punctures, coarser, impressed, not touching. Abdomen microreticulate; finely, distantly punctate; last sternum more coarsely punctate, especially in a small triangular area near posterior margin.

Male: Unknown.

PARATYPES: MEXICO: Baja California: 5 females, same data as holotype (CAS, except 1 DPWC); 1 female, Aqua Caliente, Rio Chorro, 29/7/73, H. P. Brown (HPBC).

*Eulimnichus acutus* new species

HOLOTYPE: Male. Costa Rica, Las Canas, 13.VII.1965, P. J. Spangler. USNM Type No. 73834. Length 1.9 mm. Width 1.1 mm. Elongate oval, sides parallel. Black. Head with margins of front with depressions in front of eyes and at ends of epistomal suture, but not notched; sculpture deeply longitudinally coalescent to vertex, punctation coarse, close (1 $\times$ ); pubescence short, recumbent in grooves. Pronotum shining; punctation perforate, close (1 $\times$ ); transverse row of punctures distinct, very straight; midline impressed; pubescence short, recumbent. Elytra with impressed, close (1-1 $\frac{1}{2}$  $\times$ ) punctation; pubescence short. Epipleura nearly flat, shining but dull; punctation close, impressed. Prosternal punctation fine, barely impressed, close (2-3 $\times$ ). Hypomera microreticulate, punctation fine; outer margin fairly straight; outer anterior angle prolonged into an acute tooth. Metasternum with close (1 $\times$ ), medium, perforate punctures at sides, becoming slightly more distantly punctate at midline, a few minute punctures scattered among the larger ones; surface depressed behind the posterior row of punctures which is coarse and irregular near midline, smaller and contiguous at sides. Abdomen dull, punctation small, barely impressed at midline, becoming slightly coarser and larger at sides, on last sternum more coarse and close; central triangle not large but distinctly impressed and coarsely punctate. Aedeagus with tips of parameres blunt. Tip of penis narrow and acute (Fig. 7).

ALLOTYPE: Female. Same data as holotype. Externally identical to male except central triangle of last sternum small and indistinct.

PARATYPES: COLOMBIA: Magdalena: 7 males, 17 females, Rio Frio, Darlington (MCZ); 1 male, 2 females, Rio Frio, 1-10.V.28, Darlington (MCZ); 1 female, Rio Frio, III.1928, Darlington (MCZ). COSTA RICA: 179 males, 453 females, same data as holotype (USNM); 1 female, on sandbank, 12.II.35, F. Neverman (USNM). EL SALVADOR: 1 female, Lk. Ilopango, 2.VIII.1965, P. J. Spangler (USNM). GUATEMALA: 57 males, 6 females, Suchit, Fca Lamaquina (22 km S) Rio Sis, 11 June, 1966, O. S. Flint, Jr. (USNM). HONDURAS: 11 females, Comayagua (NW), Rio



Humuya, 3 Aug., 1967, O. S. Flint, Jr. (USNM); 11 males, 2 females, Jicaro Galen Jct., 5 mi. W, 9.VII.1965, Paul J. Spangler (USNM); 1 male, 1 female, Jicaro Galen Jct., 29.VII.1965, Paul J. Spangler (USNM); 3 females, Pespire, 29.VII.1965, P. J. Spangler (USNM); 1 female, Rio Verdura, S of San Antonio Flores, 26/11/66, Harley P. Brown (HPBC). MEXICO: Chiapas: 2 females, Suchiapa, 18.VII.57, P. O. Hurd (CISC). San Luis Potosi: 2 males, 1 female, Quinta Chilla near Tamazunchala, 21.XII.1948, Hugh B. Leech (CAS); 8 males, 6 females, Tamazunchale, Quinta Chilla Cts. black light trap, 28 June, 71, ca 600', A. Newton (INHS). Tabasco: 6 males, 3 females, Rio Puyacatengo, E. Teapa, 28-29 July, 1966, Flint and Ortiz (USNM). Vera Cruz: 1 female, 2 mi W Fortin de las Flores, at light, 27.VI.62, D. H. Janzen (CISC); 6 females, Puente Nacional, 24 Aug., 1967, at blacklight (USNM); 1 male, 5 females, Puente Nacional, 26.VIII.67, at blacklight, H. R. Burke and J. Hafernik (TAMU).

*Eulimnichus subitus* new species

**HOLOTYPE:** Male. Alabama. Mobile. 6.22, Liebeck Collection. (MCZ). Length 1.7 mm. Width 1.0 mm. Ovate. Black. Head with margins of front very deeply depressed but not notched at ends of epistomal suture; sculpture coarsely longitudinally coalescent to vertex; punctation fine, distant on vertex; pubescence short, recumbent in grooves. Pronotum shining; punctation fine, distant (5-7X), barely impressed; transverse row of punctures barely visible; pubescence short, sparse, recumbent. Elytra shining; punctation shallow, impressed, close (2X); pubescence short, recumbent. Epipleura shining, flat; minutely, sparsely punctate. Prosternum finely, sparsely punctate. Hypomera narrow; microreticulate, minutely punctate; anterior outer angle acute and slightly produced; outer margin very lightly curved. Metasternum finely, distantly (5-7X) punctate at midline, slightly more impressed and closer (2-3X) at sides; posterior row of punctures close (1X) but not very impressed. Abdomen shining, finely sparsely punctate; last sternum with some coarser punctures near apex, central triangle depressed, equilateral. Aedeagus with tips of parameres very strongly divergent, tips rounded. Penis broad, pointed at tip (Fig. 8).

**ALLOTYPE:** Female. Same data as holotype. Externally identical to male, except central triangle of last sternum not at all impressed.

**PARATYPES:** FLORIDA: 2 females, Belleair, Liebeck Coll. (MCZ); 1 male, 1 female, Jacksonville, Liebeck Coll. (MCZ); 1 male, 1 female, Ormond, Liebeck Coll. (DPWC).

*Eulimnichus spangleri* new species

**HOLOTYPE:** Male. Guatemala, Suchit, Fca. Lamaquina 22 km S Rio Sis, 11 June, 1966, O. S. Flint, Jr. USNM Type No. 73835. Length 2.3 mm. Width 1.3 mm. Elongate oval. Black. Head with margins of front each with two small depressions but not notched at ends of epistomal suture; sculpture longitudinally coalescent to vertex; pubescence short, recumbent in grooves. Pronotum shining; punctation perforate, moderately close (3-4X), slightly less impressed at midline; transverse series indistinct; pubescence recumbent. Elytra shining, surface somewhat ridged between the distinct, slightly coarse, close (1-2X) punctation; pubescence recumbent, short. Epipleura slightly concave, shining, punctation small, not impressed. Prosternal punctation not impressed, fine, distant (4-5X or more). Hypomera microreticulate, finely punctate; outer anterior angle acutely pointed but not particularly produced; outer margin evenly curved from just behind anterior margin. Metasternum with large, not crowded (2X) punctation, punctures slightly smaller and closer at midline; surface depressed behind the posterior row of coarse punctures. Abdomen microreticulate; punctation shallow and coarse at midline, becoming more impressed and coalescent at sides; last sternum with closer and coarser punctation, central triangle depressed, somewhat heart-shaped. Aedeagus with outer margins of parameres curving strongly inward to tips; inner margins nearly straight until just before tip. Penis narrowing sinuately to the narrowly rounded tip (Fig. 9).

**ALLOTYPE:** Female. Same data as holotype. Externally identical to male except central triangle of last sternum small, not impressed.

PARATYPES: EL SALVADOR: 2 females, Lk Ilopango, 2.VIII.1965, Paul Spangler (USNM). GUATEMALA: 1 female, same data as holotype (USNM). HONDURAS: 1 female, Comayagua (NW), Rio Humoya, 3 Aug., 1967, O. S. Flint, Jr. (DPWC); 1 male, 1 female, Jicaro Galen Jct., 5 mi W, 9.VII.1965, Paul J. Spangler (DPWC); 1 female, 12 km W Olanchito, 5 July, 1949, E. C. Becker (INHS). MEXICO: Vera Cruz: 1 female, Paso Cano, Rio Papsloapan, 19.IV.32, Van Dyke Coll. (CAS).

It is with great pleasure I name this species for Dr. Paul J. Spangler. Without his aid and encouragement this study could never have been completed.

KEY TO THE SPECIES OF *EULIMNICHUS*

- 1. Margin of frons with a distinct notch at each end of the epistomal suture, revealing basal antennal segments. . . . . 2
- 1'. Margins of frons not at all notched at ends of epistomal suture, although the surface may be depressed . . . . . 14
- 2(1). Outer anterior angles of hypomera prolonged into an acute, tooth-like projection; notches at ends of epistomal suture very small . . . . . 3
- 2'. Outer anterior angles of hypomera not prolonged or toothed; notches at ends of epistomal suture variable . . . . . 4
- 3(2). Second visible sternum with an impunctate, polished, depressed area on each side of the midline to receive the metatarsi in repose (Guatemala) . . . *sordidus* Sharp
- 3'. Second visible sternum without any sign of polished area to receive the metatarsi in repose (NE Mexico) . . . . . *visendus* new species
- 4(2'). Pronotum with transverse series of punctures distinct at least near the midline; surface usually depressed behind the punctures . . . . . 5
- 4'. Pronotum without a trace of transverse series of punctures . . . . . 11
- 5(4). Surface of pronotum microreticulate along the posterior angles. . . . . 6
- 5'. Surface of pronotum with no trace of microreticulation . . . . . 8
- 6(5). Outer margins of hypomera evenly curved; pronotal punctation close and perforate (Venezuela to Argentina) . . . . . *corrinae* new species
- 6'. Outer margins of hypomera straight for about 2/3 the distance from outer posterior angle to outer anterior angle. . . . . 7
- 7(6'). Pronotal punctation perforate, close, size larger, about 2.2 mm long. (Ecuador) . . . . . *langleyae* new species
- 7'. Pronotal punctation fine and distant; size small, about 1.6 mm long (Guatemala). . . . . *sublaevis* Sharp
- 8(5'). Metasternum with a distinct row of impressed punctures just before the posterior margin; more than 1.5 mm long . . . . . 9
- 8'. Metasternum without a distinct row of impressed punctures just before the posterior margin; about 1.2 mm long (Guatemala to Costa Rica) . . . . . *ephistemus* Sharp
- 9(8). Punctation of head coalescent into longitudinal grooves, at least on frons . . . 10
- 9'. Punctation of head not noticeably coalescent (Bolivia & Ecuador) . . . . . *coheni* new species
- 10(9). Inner and outer hypomeran margins nearly parallel-sided; length less than 2.0 mm (Massachusetts) . . . . . *improcerus* new species
- 10'. Outer hypomeran margins curved, diverging from inner margin; length more than 2.0 mm (Venezuela) . . . . . *pellucidus* new species
- 11(4'). Hypomera broad, outer margins evenly curved; metasternal punctation of two sizes, larger perforate punctures and scattered minute punctures . . . . . 12
- 11'. Hypomera narrower, outer margins nearly parallel with inner margins . . . . . 13
- 12(11). Pronotum with sides depressed and flattened; appearing almost explanate from above (Mexico) . . . . . *sharpi* new species

- 12'. Pronotum not particularly flattened at sides (S Mexico to Argentina & Peru). . . . . *plebius* Sharp
- 13(11'). Pronotum microreticulate along posterior angles; femora red-brown (Bolivia & Ecuador) . . . . . *incultus* new species
- 13'. Pronotum polished, without a trace of microreticulation (SE U.S. to Argentina). . . . . *nitidulus* (LeConte)
- 14(1'). Elytra strongly alutaceous, surface very dull on disk . . . . . 15
- 14'. Elytra polished and shining on disk . . . . . 17
- 15(14). Elytral punctation distinctly impressed on the alutaceous background . . . . . 16
- 15'. Elytral punctation indistinct, almost unnoticeable on the alutaceous background (Oregon to Central Mexico) . . . . . *montanus* (LeConte)
- 16(15). Metasternal punctation about equal in size across width, punctures small, close, not perforate (eastern U.S.) . . . . . *obscurus* (LeConte)
- 16'. Metasternal punctation perforate and close at sides becoming finer and more distant at midline (north central U.S.) . . . . . *rugulosus* new species
- 17(14'). Pronotum microreticulate near posterior angles . . . . . 18
- 17'. Pronotum not at all microreticulate . . . . . 24
- 18(17). Outer anterior hypomerall angle distinctly prolonged into an acute tooth . . . 19
- 18'. Outer anterior hypomerall angles not prolonged although they may be acute . . 20
- 19(18). Metasternal punctation closely perforate at sides, becoming more distantly and shallowly punctate at midline; transverse series of pronotum absent (Oklahoma & Texas to Washington & California) . . . . . *analisis* (LeConte)
- 19'. Metasternal punctation distantly perforately punctate, about even from sides to midline; transverse series of pronotum distinct at midline and sides, but interrupted between (Baja California) . . . . . *rusticus* new species
- 20(18'). Elytral punctation close, punctures separated by only about one to two times the diameter of a puncture . . . . . 21
- 20'. Elytral punctation distant, punctures separated by three to five or more times the diameter of a puncture . . . . . 22
- 21(20). Elytral punctation perforately impressed on disk, form ovate (Oregon to S California) . . . . . *californicus* (LeConte)
- 21'. Elytral punctation fine, distinct but not at all impressed, form narrowly elongate (Brazil) . . . . . *impostus* new name
- 22(20'). Elytral punctation lightly impressed on disk; transverse series of pronotal punctures faintly marked at sides of arc, not at all visible at midline (Mexico & SE U.S.) . . . . . *optatus* Sharp
- 22'. Elytral punctation barely or not impressed on disk; transverse series of punctures not visible . . . . . 23
- 23(22'). Metasternum depressed behind the row of small, indistinct punctures just before the posterior margin (SW U.S.) . . . . . *perpolitus* Casey
- 23'. Metasternum not at all depressed behind the row of minute punctures just before the posterior margin (S California) . . . . . *evanescent* Casey
- 24(17'). Elytral margins with a row of deep, perforate punctures extending from humeri to about 3/4 their length (E U.S. to Argentina & W coast of Mexico) . . . . . *ater* (LeConte)
- 24'. Elytral margins normally punctate, no deep perforate row of punctures . . . . 25
- 25(24'). Each anterior outer hypomerall angle produced into a distinct tooth (Mexico to Columbia) . . . . . *acutus* new species
- 25'. Each anterior outer hypomerall angle acute but not distinctly prolonged. . . . 26
- 26(25'). Epipleura flat, sparsely punctate; metasternum not depressed behind row of punctures near hind margin; length less than 2.0 mm (Gulf Coast of U.S.) . . . . . *subitus* new species
- 26'. Epipleura slightly concave, punctures minute; metasternum depressed behind row of punctures near hind margin; length more than 2.0 mm (Guatemala to Honduras) . . . . . *spangleri* new species

ACKNOWLEDGMENTS

Thanks are due to numerous individuals and museums for the loan of the many specimens used in this study. In addition to those mentioned earlier in this paper, I owe special thanks to the following: R. D. Pope and P. M. Hammond (BMNH); H. B. Leech (retired) and D. H. Kavanaugh (CAS); J. A. Chemsak (CISC); M. W. Sanderson (retired) and W. U. Brigham (INHS); J. Lawrence and Margaret K. Thayer (MCZ); H. R. Burke and J. C. Schaffner (TAMU); L. S. Bayer and W. Hilsenhoff (UWEM); and P. J. Spangler (USNM).

LITERATURE CITED

Wooldridge, D. P. 1978. New World Limnichinae IV. *Eulimnichus* Casey. A. Synonymies, lectotype designations and redescrptions (Coleoptera: Limnichidae). Great Lakes Entomol. 11:163-173.