Luchoelmis, a new genus of Elmidae (Coleoptera) from Chile and Argentina

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Abstract. *Luchoelmis* New Genus is described with four new species: *aequalis*, *magallanensis*, and *penai* from Chile and *cekalovici* from Argentina and Chile. *Luchoelmis penai* is designated as the type species of the genus. A key to the four species is presented.

Introduction

This publication is part of the ongoing study of Western Hemisphere Elmidae. The new genus described below was first collected by the senior author in 1969 and additional specimens were found in the Smithsonian Institution (NMNH) and California State University (USUS) collections.

In the Western Hemisphere the subfamily Elminae contains 58 genera, 400 species, and 8 subspecies. There has been little systematic work done on the subfamily, especially in South America.

Luchoelmis, new genus

(Figs. 1-9)

Description: Antennae, palpi, and legs (except apex of femora and base of tibiae) reddish-brown. **Head**: Opisthognathus; moderately coarsely punctate, punctures usually separated by 1 or 2x their diameter; surface between punctures smooth; clypeus punctate similarly to vertex, punctures medially smaller than those on head; labrum rectangular, anterior margin truncate, moderately coarsely punctate. **Thorax**: Sides sinuate; anterior margin arcuate over base of head; anterolateral and posterolateral angles obtuse, not produced; posterolateral margin trisinuate; surface with a transverse groove at apical 1/3 and a strong oblique groove at basal 1/3; apical transverse groove followed by a short, longitudinal depression on midline; strong anterior and posterior longitudinal depression adjacent to lateral margin; basal margin with 2 foveae, one on each side of scutellar emargination, space between foveae convex; punctures mostly coarse, dense on anterior 1/3, in depressions on disc and in lateral margins; punctures in depressions close, separated by about their diameter; punctures on elevated areas less dense and separated by about 2x their diameter; integument between punctures smooth. **Elytron**: With 10 rows of coarse punctures; punctures separated by 0.5 to 1x their diameter; intervals punctate, punctures moderately coarse and separated by 2 to 4x their diameter; basal punctures of rows 2-5 between scutellum and humerus coarse and deep, rugose; humeri swollen; carinae absent. **Venter**: Prosternum rather short and transversely concave in front of procoxae, prosternal process very narrow, elongate, parallel-sided, longitudinally sulcate; apex bluntly rounded; mesosternum deeply concave on midline in front of mesocoxae; metasternum strongly raised apicomedially between mesocoxae, then slightly depressed before raised disc, discrimen deep and widest on posterior 1/2, parallel to discrimen and on each side at about midlength, with a cluster of long setae arising from an elongate fovea on males. **Leg**: With visible portion of procoxa rounded and trochantin concealed by the hypomera; profemur with basal cleaning fringe on anterior surface and about half length of femur; protibia, mesotibia, and metatibia without cleaning fringe but pubescence of apicomedial area of protibiae slightly more dense than on base; densely pubescent in males; apical tarsomere as long as 1-4 combined; tarsal claws thick, without teeth. **Abdomen**: Sterna 1-5 normally convex and not lobed laterally.

Etymology. Named for Lucho (Luis) Pena plus elmis. Lucho was a friend, an entomologist, conservationist, and author of numerous books and scientific articles concerned with Chilean natural history subjects.

Type species. *Luchoelmis penai* New Species.

Comparative notes. *Luchoelmis* belongs to the subfamily Elminae because, ventrally and sometimes dorsally, they have tracts of intricate plastron setae instead of usually dense hydrofuge pubescence dorsally and ventrally; have 5 visible abdominal sterna instead of 6; procoxae usually round and with trochanter concealed instead of strongly transversely visible; and seldom or never leave their aquatic habitats. *Luchoelmis* differs from all other New World Elmidae by the following combination of characters: head opisthognathus, body elongate, sides subparallel; plastron absent from pronotum and elytra; accessory stria absent between elytral striae 1 and 2; pronotum without sublateral carinae; pronotum with strong anterior and posterior depression adjacent to lateral margin, with transverse groove at apical 1/3 and strong oblique groove at basal 1/3; prosternum shorter in front of procoxae than length of procoxae; tooth absent from base of tarsal claws.

Key to the species of *Luchoelmis*

1. Pronotum with basal margin as wide as anterior margin; male genitalia as in Fig. 1 ..... *aequalis* New Species
— Pronotum with basal margin wider than anterior margin; male genitalia not as in Fig. 1 2

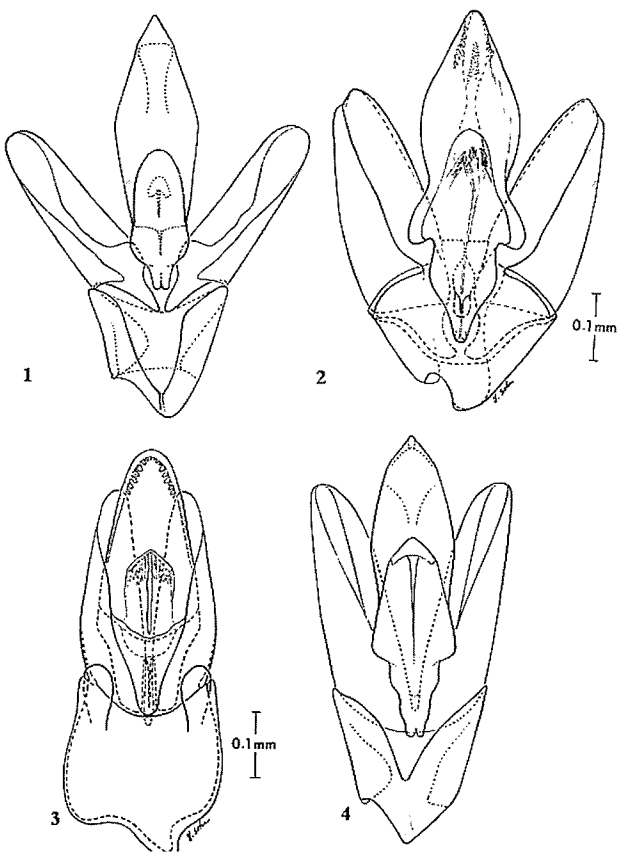
2. No femora with cleaning fringe; pronotum widest at about midlength; male genitalia as in Fig. 4 ..... *penai* New Species
— Profemora and mesofemora with cleaning fringe on some surfaces; pronotum widest after midlength; male genitalia not as in Fig. 4 3

3. Female without cleaning fringe on front surface of profemora; male genitalia as in Fig. 2 ..... *cekalovici* New Species
— Female with cleaning fringe on front surface of profemora; male genitalia as in Fig. 3 ..... *magallanensis* New Species

Luchoelmis aequalis, new species
(Fig. 1)

Description: Holotype (male). Body obovate-elongate; length 1.95 mm; width 0.7 mm. Dorsum shining black, venter black; antennae, palpi, and legs (except apex of femora and base of tibiae) reddish-brown. **Head**: Moderately coarsely punctate, punctures usually separated by 1 or 2x their diameter; surface between punctures smooth; clypeus punctate similarly to vertex of head, punctures medially smaller than those on head; labrum rectangular, anterior margin truncate, moderately coarsely punctate. **Thorax**: Pronotum widest about midlength; as wide at base as at apex; sides sinuate; anterior margin sinuate over base of head; anterolateral and posterolateral angles obtuse, not produced; posterolateral margin trisinuate; surface with a transverse groove on apical 1/3 and an oblique groove at about midlength; apical transverse groove followed by a short triangular longitudinal depression on midline; strong anterior and posterior depression adjacent to lateral margin; basal margin with 2 foveae, one on each side of scutellar emargination; space between foveae convex; punctures mostly coarse, dense on anterior 1/3, depressions on disc and in lateral margins; punctures in depressions scattered, separated by about 2x their diameter; those punctures on elevated areas less dense and separated by about 3x their diameter; integument between punctures smooth. **Elytron**: With 10 rows of coarse punctures; punctures separated by 0.5 to 1x their diameter; intervals punctate, punctures moderately coarse and separated by 2 to 4x their diameter; humeri swollen; carinae absent; prosternum rather short in front of procoxae, prosternal process very narrow, elongate, parallel-sided, longitudinally sulcate, apex bluntly rounded; mesosternum moderately depressed on midline in front of mesocoxae; metasternum strongly raised apicomedially between mesocoxae, then slightly depressed before raised disc; disc with deep longitudinal groove on posterior 1/2. **Leg**: With visible portion of procoxa rounded and trochantin concealed by the hypomera; protibia, mesotibia, and metatibia without cleaning fringe but pubescence of apicomedial area of protibia slightly more dense than on base; profemur with cleaning fringe on rear surface; mesofemur with cleaning fringe on front surface; metafemur without cleaning fringe; tarsal claws thick, without teeth. **Abdomen**: Sterna 1-5 normally convex and not lobed laterally. **Male genitalia** as illustrated in (Fig. 1). Female externally similar to male except lacking a cluster of setae on the metasternum.

Type data: Holotype (male). CHILE: Prov. Concepcion, sample #7, Tomas Cekalovic; deposited in the National Museum of Natural History, Smithsonian Institution (NMNH). Allotype (female): Chile: Lian., 10 km N. Pargua, VI-5-1969, P. & P. Spangler (NMNH). Paratypes (7): 4 females- same label data as allotype (NMNH); 3 males- Chile, Pr. Arauco, Puente Rio Trongol, 12 Abril 1997, Thomas Cekalovic (UCUS).



Figures 1-4. Male genitalia of *Luchoelmis* spp. 1. *aequalis*. 2. *cekalovici*. 3. *magallanensis*. 4. *penai*.

Etymology. From *aequalis* (Latin= like, same, uniform) for the anterior and basal margins of the pronotum being the same width.

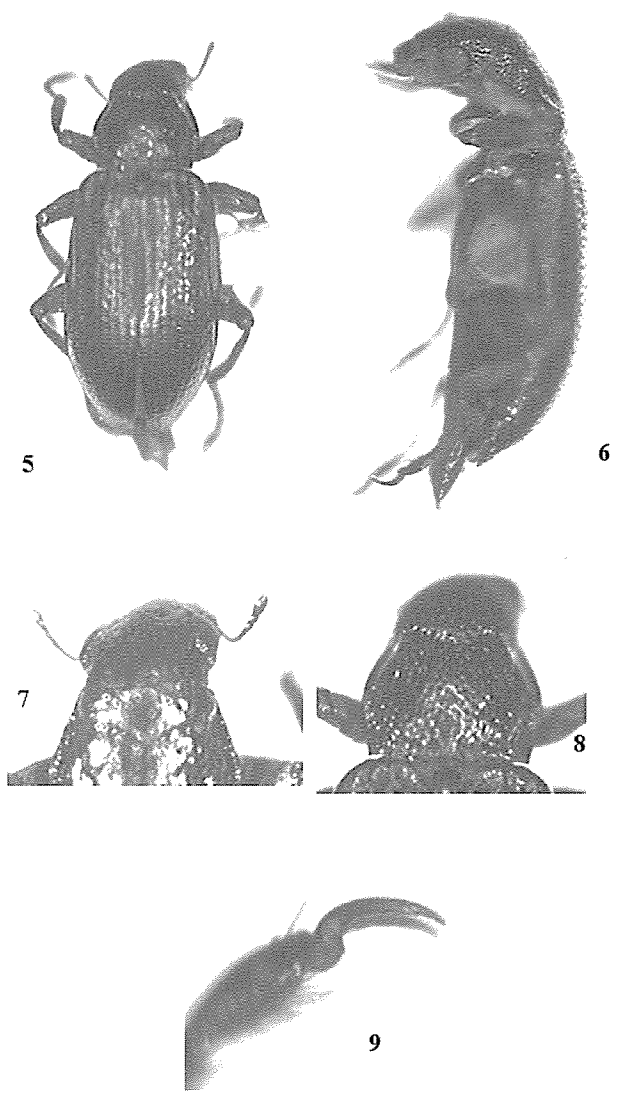
Luchoelmis cekalovici, new species
(Fig. 2)

Description: Holotype (male). Body obovate-elongate; length 2.4 mm; width 0.8 mm. Dorsum shining black, venter black; antennae, palpi, and legs (except apex of femora and base of tibiae) reddish-brown. **Head**: Moderately coarsely punctate, punctures usually separated by 1 or 2x their diameter; surface between punctures smooth; clypeus punctate similarly to vertex of head, punctures medially smaller than those on head; labrum rectangular, anterior margin truncate, moderately coarsely punctate. **Thorax**: Pronotum widest behind middle; base wider than apex; sides sinuate; anterior margin arcuate over base of head; anterolateral and posterolateral angles obtuse, not produced; posterolateral margin trisinuate; surface with a transverse groove at apical 1/3 and a strong oblique groove at basal 1/3; apical transverse groove followed by a short, longitudinal depression on midline; strong anterior and posterior longitudinal depression adjacent to lateral margin; basal margin with 2 foveae, one on each side of scutellar emargination, space between foveae convex; punctures mostly coarse, dense on anterior 1/3, in depressions on disc and in lateral margins; punctures in depressions close, separated by about their diameter; punctures on elevated areas less dense and separated by about 2x their diameter; integument between punctures smooth. **Elytron**: With 10 rows of coarse punctures; punctures separated by 0.5 to 1x their diameter; intervals punctate, punctures moderately coarse and separated by 2 to 4x their diameter; basal punctures between scutellum and humerus deep, rugose; humerus swollen; carinae absent. **Venter**: Prosternum rather short in front of procoxae; prosternal process very narrow, elongate, parallel-sided, longitudinally sulcate, apex bluntly rounded; mesosternum moderately depressed on midline in front of mesocoxae; metasternum strongly raised apicomedially between mesocoxae, then slightly depressed before raised disc, disc with deep longitudinal groove on posterior 1/2. **Leg**: With visible portion of procoxa rounded and trochantin concealed by the hypomera; protibia, mesotibia, and metatibia without cleaning fringe but pubescence of apicomedial area of protibia slightly more dense than on base; profemur without cleaning fringe on rear surface; mesofemur with small cleaning fringe on front surface; metafemur without cleaning fringe; tarsal claws thick, without teeth. Abdomen: Sterna 1-5 normally convex and not lobed laterally. **Male genitalia** as illustrated in (Fig. 2). Female externally similar to male except lacking a cluster of setae on the metasternum.

Variation. Two specimens have the elytron reddish-brown. The female does not have a cleaning fringe on the front surface of the profemora. Length 2.1-2.3 mm; width 0.7-.09 mm.

Type data. Holotype (male): CHILE: Las Raices, Curacautin, Malleco, 14-III-1984, Luis Pena (NMNH). Allotype (female): ARGENTINA: Neuq. Ao. Cordoba Grande, Caleufu, 3 Mar 1978, C. M. & O. S. Flint, Jr. (NMNH). Paratypes (82): 1 male- same data as holotype (NMNH); 80- same data as allotype (NMNH); 1 male- CHILE: Osorno P.N. Puyehue, Salto del Indio, 1-12 Feb 1978, C. M. & O. S. Flint Jr. (NMNH).

Etymology. Named for Tomas Cekalovic.



Figures 5-9. *Luchoelmis penai*. 5. Dorsal habitus. 6. Lateral view. 7. Head. 8. Thorax. 9. Tarsal claw.

Luchoelmis magallanensis, new species
(Fig. 3)

Description: Holotype (male). Body obovate-elongate; length 2.4 mm; width 0.7 mm. Dorsum shining, pronotum black, elytron reddish-brown, venter black; antennae, palpi, and legs reddish-brown. **Head**: Moderately coarsely punctate, punctures usually separated by 1 or 2x their diameter; surface between punctures smooth; clypeus punctate similarly to vertex of head, punctures medially smaller than those on head; labrum rectangular, anterior margin truncate, moderately coarsely punctate. **Thorax**: Pronotum widest behind middle; base wider than apex; sides sinuate; anterior margin arcuate over base of head; anterolateral and posterolateral angles obtuse, not produced; posterolateral margin trisinuate; surface with a transverse groove at apical 1/3 and a strong oblique groove at basal 1/3; apical transverse groove followed by a short, longitudinal depression on midline; strong anterior and posterior longitudinal depression adjacent to lateral margin; basal margin with 2 foveae, one on each side of scutellar emargination, space between foveae convex; punctures mostly coarse, dense on anterior 1/3, in depressions on disc and in lateral margins; punctures in depressions close, separated by about their diameter; punctures on elevated areas less dense and separated by about 2x their diameter; integument between punctures smooth. **Elytron**: With 10 rows of coarse punctures; punctures separated by 0.5 to 1x their diameter; intervals punctate, punctures moderately coarse and separated by 2 to 4x their diameter; basal punctures between scutellum and humerus deep, rugose; humerus swollen; carinae absent. **Venter**: Prosternum rather short in front of procoxae; prosternal process very narrow, elongate, parallel-sided, longitudinally sulcate, apex bluntly rounded; mesosternum moderately depressed on midline in front of mesocoxae; metasternum strongly raised apicomedially between mesocoxae, then slightly depressed before raised disc, disc with deep longitudinal groove on posterior 1/2. **Leg**: With visible portion of procoxa rounded and trochantin concealed by the hypomera; protibia, mesotibia, and metatibia without cleaning fringe but pubescence of apicomedial area of protibia slightly more dense than on base; profemur with cleaning fringe on rear surface; mesofemur with cleaning fringe on front surface; metafemur without cleaning fringe; tarsal claws thick, without teeth. Abdomen: Sterna 1-5 normally convex and not lobed laterally. **Male genitalia** as illustrated in (Fig. 3). Female externally similar to male except lacking a cluster of setae on the metasternum.

Variation. Allotype with cleaning fringe present on front surface of profemora; length 2.4 mm; width 0.8 mm.

Type data. Holotype (male): CHILE: Magallanes, Peninsula de Brunswick, Estero del Medio, Camino al Seno Otway, 26 Feb. 1971, T. Cekalovic coll (NMNH). Allotype (female): same data as holotype (NMNH). Paratypes (2): Chile, Pr. Arauco, Puente, Rio Trongol, 12 Abril 1997, Thomas Cekalovic (UCUS).

Etymology. Named for the type locality.

Luchoelmis penai, new species
(Figs. 4-9)

Description: Holotype (male). Body obovate-elongate; length 2.4 mm; width 1.3 mm. Dorsum shining black, venter black; antennae, palpi, and legs reddish-brown. **Head** (Fig. 7): With sparse, very short setae; moderately coarsely punctate, punctures separated by 1 or 2x their diameter; surface between punctures smooth anteriorly, microrecticulate posteriorly; clypeus punctate similarly to vertex of head but punctures slightly smaller; labrum rectangular, anterior margin truncate, surface moderately coarsely punctate; mentum and submentum finely microalutaceous, impunctate. **Thorax** (Fig. 8): Pronotum widest about midlength; base wider than apex; sides sinuate; anterior margin arcuate over base of head; anterolateral and posterolateral angles obtuse, not produced; posterolateral margin trisinuate; surface with a transverse groove at apical 1/3 and a strong oblique groove at basal 1/3; apical transverse groove followed by a broad, short, longitudinal depression on midline; strong anterior and posterior longitudinal depression adjacent to lateral margin; basal margin with 2 foveae, one on each side of scutellar emargination, space between foveae convex; punctures mostly coarse, dense on anterior 1/3, in depressions on disc and in lateral margins; punctures in depressions close, separated by about 1/3 their diameter; those punctures on elevated areas less dense and separated by about their diameter; integument between punctures smooth. **Elytron**: With 10 rows of coarse punctures; punctures separated by 0.5 to 1x their diameter; intervals punctate, punctures moderately coarse and separated by 2 to 4x their diameter; basal punctures between scutellum and humerus deep, rugose; humerus swollen; carinae absent. **Venter**: Prosternum rather short in front of procoxae; prosternal process very narrow, elongate, parallel-sided, longitudinally sulcate, apex bluntly rounded; mesosternum moderately depressed on midline in front of mesocoxae; metasternum strongly raised apicomedially between mesocoxae, then slightly depressed before raised disc, disc with deep longitudinal groove on posterior 1/2. **Leg**: With visible portion of procoxa rounded and trochantin concealed by the hypomera; protibia, mesotibia, and metatibia without cleaning fringe but pubescence of apicomedial area of protibia slightly more dense than on base; profemur, mesofemur, and metafemur without cleaning fringe on any surface; tarsal claws thick, without teeth (Fig. 9). Abdomen: Sterna 1-5 normally convex and not lobed laterally. **Male genitalia** as illustrated in (Fig. 4). Female externally similar to male except lacking a cluster of setae on the metasternum.

Variation. Some specimens with reddish-brown elytra. Length 2.0 to 2.4 mm; width 0.8 to 1.3 mm.

Type data. Holotype (male): CHILE: Osorno Province: Parque Nacional Puyehue, Salto del Indio, 5 February 1978, Paul J. Spangler (NMNH). Allotype (female): same data as holotype (NMNH). Paratypes (820): 43 males, 57 females- same data as holotype; 34- Chile: Osorno, P. N. Puyehue, Salta del Indio, 1-12 Feb 1978, C. M. & O. S. Flint, Jr. (NMNH); 34- Chile: Osorno Puyehue, Aguas Calientes, March 1984, collr. L. E. Pena (NMNH); 112- Chile: Pr. Arauco, Puente Rio Trongol, 12 Abril 1997, Thomas Cekalovic (UCUS); 163- Chile: Concepción, Estero Nonquén, 2 Nov 1996, Thomas Cekalovic (UCUS); 37- Chile: Concepción, Estero Nonquén, 20 Enero 1997, Thomas Cekalovic (UCUS); 124- Chile: Concepción, Estero Nonquén, 5 Octubre 1996, Thomas Cekalovic (UCUS); 2- Chile: Concepción, Estero Nonquén, 28 Sep. 1996, Thomas Cekalovic (UCUS); 4- Chile: Concepción, Estero Nonquén, 10-X-1996, Thomas Cekalovic (UCUS); 210- Chile, Pr. Concepción, Estero Nonquén, 17 Abril 1997, Thomas Cekalovic (UCUS). Paratypes are deposited in the American Museum of Natural History, New York; Natural History Museum, London; California Academy of Sciences, San Francisco; Canadian National Collection, Ottawa; Instituto Lillo, Tucuman; Institut Royal de Histoire Natural de Belgique, Brussels; Museum of Comparative Zoology, Cambridge; Museum Nacional de Historia Natural de Chile, Santiago; Museum National de Histoire Natural, Paris; Museo Argentina de Ciencias Naturales, Buenos Aires; Zoologische Sammlung Bayerischen Staates, Munchen; and Stovall Museum of Science and History, University of Oklahoma, Norman.

Etymology. Named for the late Luis E. Pena G., an eminent and dedicated Chilean coleopterist, for his many contributions to South American entomology.

Habitat. The specimens from Salto del Indio on the Rio Gol Gol at the Anticura area in the Parque Nacional Puyehue were collected by dislodging them by running a finger vigorously through aquatic moss growing on rocks in streamside pools. The pools were about 25 cm deep below the falls where the water current was minimal. The dislodged specimens would float to the surface and drift about in the slowly moving current until picked up by hand or until they

gained a foothold on the mossy rocks and crawled underwater again. The substratum between these moss-covered rocks was sand. At the time of collection, the daytime temperature was 14.5°C and the testing methods registered the following: pH5 and 0 grains per gallon. Altitude at Anticura registered about 330 m.

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