

## A new species of *Curius* Newman (Coleoptera: Cerambycidae) from Venezuela with notes on sexual dimorphism within the genus

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### Abstract

A new species, *Curius chemsaki* (Coleoptera: Cerambycidae: Cerambycinae: Curiini), from Venezuela is described. Features distinguishing the new species from its congeners as well as a key to the four species are presented. Sexual dimorphism in pronotal and prosternal morphology within the genus is also discussed.

**Key words:** Cerambycinae, Curiini, South America, taxonomy, key, long-range attractant, pheromone gland pores

### Resumen

Una nueva especie, *Curius chemsaki* (Coleoptera: Cerambycidae: Cerambycinae: Curiini), de Venezuela se describe. Se presentan características para diferenciar esta especie de otros miembros del género y también una clave para las cuatro especies. También se describe dimorfismo sexual en la morfología del pronoto y prosterno dentro del género.

**Palabras clave:** Cerambycinae, Curiini, Sud America, taxonomía, clave, attractante de largo alcance, poros glandulares de pheromones

### Introduction

As currently defined, the genus *Curius* Newman, 1840 contains three species: *Curius dentatus* Newman, 1840, known from southeastern United States, *Curius panamensis* Bates, 1885, known only from Panama, and *Curius punctatus* (Fisher, 1932), an endemic Cuban species (Monné, 2005; Monné & Hovore, 2005; Nearns et al., 2005; Peck, 2005). LeConte (1873) designated the tribe Curiini (= Curii) with *Curius* as the type genus and synonymized *Plectromerus concinnatus* Haldeman, 1847 with *C. dentatus*. Linsley (1963)

provided a diagnosis of the tribe and genus based on the two North American species, *C. dentatus* and *Plectromerus dentipes* (Olivier, 1790). Zayas (1975) provided a description and illustration of *Pentomacrus punctatus* Fisher, 1932 and Lingafelter (2005) provided a color photograph of the holotype. Nearn et al. (2005) transferred *P. punctatus* to *Curius*.

During the senior author's revisionary work on the tribe Curiini, 23 specimens of a new species of *Curius* collected in Aragua, Venezuela were discovered. The species described herein is the first record of a curiine in South America and represents a significant range extension for the genus.

### Material and Methods

Specimens from the following collections were examined. The following acronyms are used throughout the paper:

AMNH	American Museum of Natural History, New York, NY, USA
BMNH	The Natural History Museum, London, United Kingdom
CMNH	Carnegie Museum of Natural History, Pittsburgh, PA, USA
EFGC	Edmund F. Giesbert Collection, Gainesville (at FSCA), FL, USA
ENPC	Eugenio Nearn Private Collection, Gainesville, FL, USA
EMEC	Essig Museum of Entomology, University of California, Berkeley, CA, USA
FDZC	Fernando de Zayas Collection, La Habana, Cuba
FSCA	Florida State Collection of Arthropods, Gainesville, FL, USA
FVPC	Francesco Vitali Private Collection, Genova, Italy
FTHC	Frank T. Hovore Private Collection, Santa Clarita, CA, USA
IESC	Instituto de Ecología y Sistemática, La Habana, Cuba
INBio	Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica
JAMC	Julio and Charyn Micheli Private Collection, Ponce, PR, USA
JEWC	James E. Wappes Private Collection, Bulverde, TX, USA
LSAM	Louisiana State Arthropod Museum, Baton Rouge, LA, USA
MNRJ	Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil
RFMC	Roy F. Morris Private Collection, Lakeland, FL, USA
RHTC	Robert H. Turnbow, Jr. Private Collection, Ft. Rucker, AL, USA
TAMU	Texas A&M University, College Station, TX, USA
UCRC	University of California Entomology Research Collection, Riverside, CA, USA
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC, USA
WIBF	West Indian Beetle Fauna Project, Michael A. Ivie, Bozeman, MT, USA

More than 600 specimens from 22 described species of Curiini were compared. Observations of the specimens were made using a Nikon SMZ800 stereomicroscope with 20× eyepieces. Habitus photographs were produced with an Auto-Montage Pro© system. Specimens were imaged with a JEOL JSM-5510LV Scanning Electron Microscope operated at 1.5kV.

***Curius chemsaki* Nearns & Ray, new species**

Figs. 1a–b, 2a–d

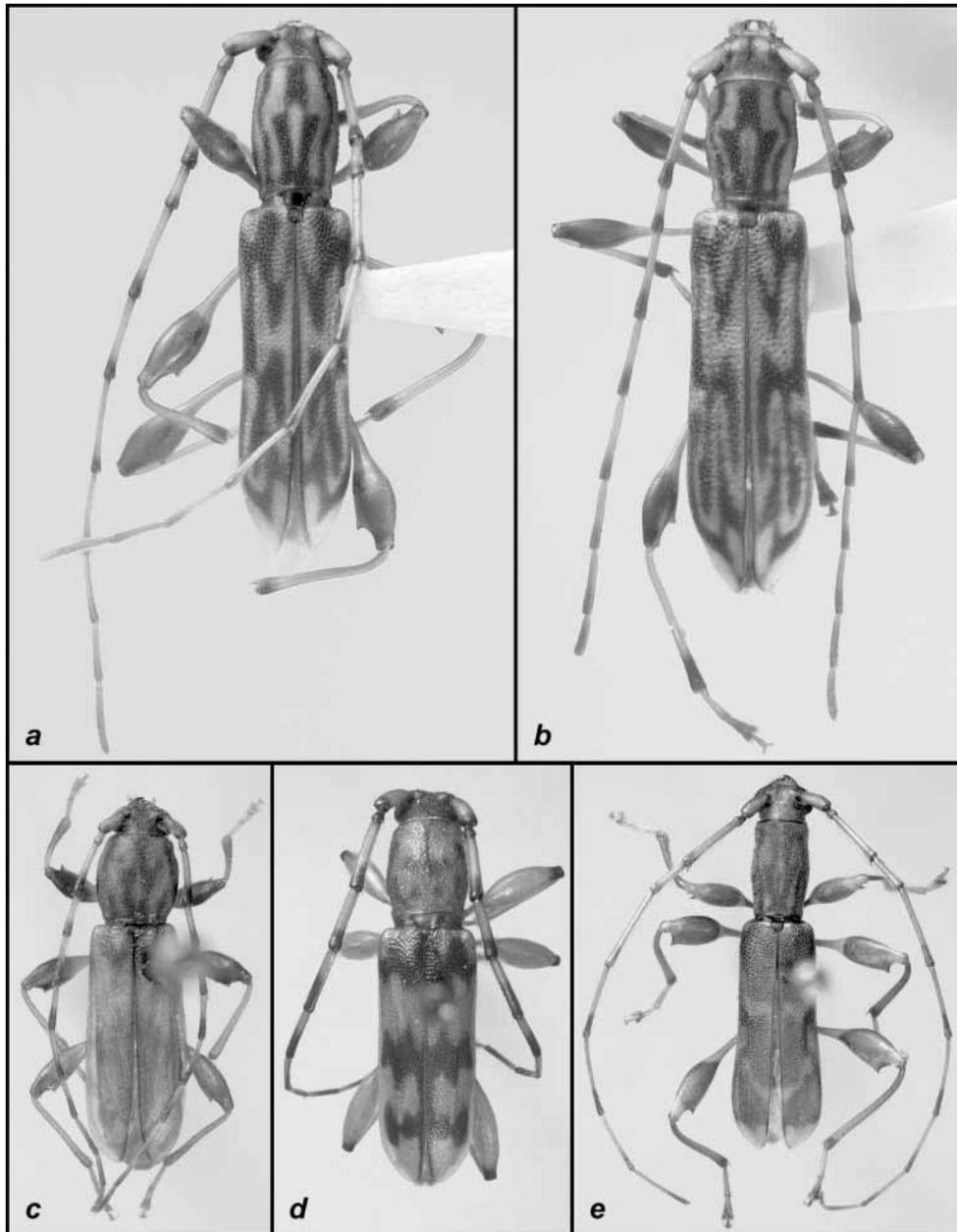
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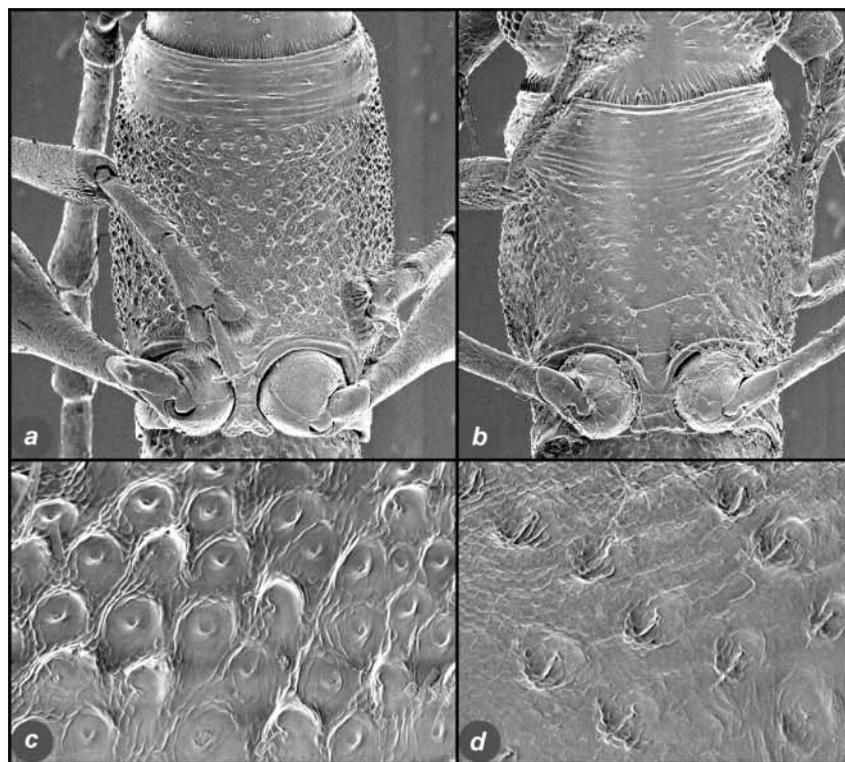
*Description*

MALE. Length 8.4 mm, width 1.7 mm (measured across humeri). Habitus as in Figure 1a. General form small, narrow, subcylindrical. Integument testaceous, with portions of head, antennal apices, pronotum, elytra, apical portions of femora and tibiae, and sternum ferrugineous. *Head* with front nearly flat, transverse, with a median, shallow groove from between eyes to just beyond vertex, concave between antennal tubercles, which are moderately raised and widely separated. Eyes coarsely faceted, transverse, subreniform, shallowly emarginate. Antennae eleven-segmented, subcylindrical, about 1.5 times longer than body; scape slightly bowed, slightly longer than fourth antennomere, third antennomere longest, more than 2 times longer than fourth, slightly longer than fifth, fifth is second longest, seventh slightly longer than sixth. Antennomeres 2–8 ciliate beneath with coarse, moderately long, suberect, hairs. *Pronotum* subcylindrical, about 1.5 times as long as wide, evenly rounded at sides, widest at middle, slightly broader at base than apex, slightly constricted at basal third; disk convex, each side of pronotum with one long, suberect, pale hair position anterolaterally. Surface opaque, granulate-punctate, with a dense field of gland pores (rounded, elevated tubercles with circular median impressions, for example, Fig. 2c); surface ornamented with ferrugineous markings as follows: a narrow, longitudinal, median vitta, extending from anterior margin to middle, where it is divided into two longitudinal vittae, which extend to the base, a thinner longitudinal sinuate vitta on each side (Fig. 1a). Lateral margins of pronotum ferrugineous. *Scutellum* small, subquadrate, a little longer than broad, granulose. *Elytra* about 3 times as long as width at humeri, a little more than 4 times as long as pronotal length, about 1.4 times broader basally than pronotum at widest (at middle); sides moderately sinuate around middle; elytral apices separately pointed; epipleural margin moderately sinuate. Elytral disk nearly flat; base of each elytron slightly raised. Elytral surface opaque, with three irregularly shaped, ferrugineous, lateral vittae arranged as follows: one at basal half, two at apical half (Fig. 1a); punctation moderately dense, coarse, and deep at basal third; punctures becoming shallower towards apex and sides, almost obsolete at apical third. *Underside* with prosternum slightly shining, granulate-punctate, with raised nodules interspersed among a dense field of gland pores (rounded, elevated tubercles with circular median impressions) (Fig. 2a, c); prosternal process between coxae nearly flat, narrowest area of prosternal process about 0.3 times as wide as coxal cavity, and about 0.5 times the width of apex of process which is cordate (Fig. 2a). Mesosternum surface shining, sparsely and finely punctate. Metasternum surface shining, sparsely punctate, with moderately dense deeper punctures. Metepisternum sparsely clothed with short, recumbent, pale pubescence. Abdomen shining; sparsely, shallowly punctate; abdomen with a few long, suberect, pale hairs and punctures with a short, fine, pale hair; fifth sternite broadly subtruncate, slightly shorter than preceding sternite. *Legs* with femora clavate, meso- and

metafemora slightly arcuate, shining, clothed with recumbent, short, pale pubescence; underside of each femoral club with a small, acute triangular tooth with posterior edge smooth; metatibiae nearly straight, very slightly sinuate; clothed with fine, recumbent, pale pubescence, becoming longer apically.



**FIGURE 1.** a–b, *Curius chemsaki* Nearns & Ray, new species; a, holotype, male, dorsal habitus; b, allotype, female, dorsal habitus; c, *Curius dentatus* Newman, male, dorsal habitus; d, *Curius punctatus* (Fisher), holotype, male, dorsal habitus; e, *Curius panamensis* Bates, male, dorsal habitus.



**FIGURE 2.** a–d, *Curius chemsaki* Nearn & Ray, new species; a, holotype, male, prosternal detail; b, allotype, female, prosternal detail; c, holotype, male, prosternal gland pores (430× magnification); d, allotype, female, prosternal punctation (400× magnification).

**FEMALE.** Length 7.5–8.6 mm; width 1.5–1.7 mm (measured across humeri). Very similar to male except pronotum not as elongate, about 1.3 times as long as wide; pronotum and prosternum lacking gland pores, prosternum with sparse, shallow punctures with a short hair (Fig. 2d); narrowest area of prosternal process 0.3–0.5 times as wide as coxal cavity (Fig. 2b). Abdomen with terminal sternite evenly, broadly rounded, slightly longer than preceding sternite.

#### *Etymology*

We are pleased to name this species for John A. Chemsak, Curator Emeritus, Essig Museum of Entomology, University of California, Berkeley, for his invaluable contributions and lifelong dedication to the study of cerambycid beetles.

#### *Types*

Holotype, male, VENEZUELA, Arag., Rancho Grande, II-14-21-1969, P. & P. Spangler, collected at blacklight (USNM). Allotype, female, VENEZUELA, El Encantado, Arajua [sic] 30-VI-2001, Cope collection (JAMC). Paratype, 1: female, VENEZUELA, Aragua, Rancho Grande, 1100 m., 17–20 I 1978, blacklight, cloud forest, J.B. Heppner (USNM); 2 females, Aragua: Geremba, 2050m, VII.1991 (MNRJ).

Additional specimens have been reported to us by Alain Audureau (Saint Gilles Croix de Vie, France), but were not available for study in time for inclusion as part of the type series: 18 specimens, all from VENEZUELA, Aragua, Geremba (2050m), Alain Audureau, collection dates: 12/04/1999, 15/05/1999, 07/1999, 09/06/2000, 07/2002, 25/09/2002, 29/09/2002, 15/02/2003, 22/02/2003, 07/04/2003, 21/02/2004, 12/05/2005, 14/05/2005, 28/05/2005.

### Discussion

This species can be distinguished from its presently known congeners by the following characters: the third antennomere is longest, slightly longer than the fifth and without a spine, the fifth antennomere is about twice as long as the fourth, and the elytral apices are separately pointed. *Curius chemsaki* can be confused with *C. panamensis* since the two species share similar pronotal proportions and markings (Fig. 1a–b, e) as well as similar pronotal and prosternal punctation and nodules. However, the new species can be distinguished by antennal morphology: both sexes of *C. panamensis* have a strong spine at the apex of the third antennomere (absent in *C. chemsaki*) and the third antennomere is equal to or slightly shorter than the fifth in *C. panamensis* (the third antennomere is slightly longer than the fifth in *C. chemsaki*). Also, the pronotum and elytra of *C. panamensis* are clothed with short, pale, recumbent, moderately dense hairs (absent in *C. chemsaki*) and the elytral apices of *C. panamensis* are rounded (separately pointed in *C. chemsaki*).

Linsley (1963) defined the genus based on the North American species, *C. dentatus*. Based on Bates' original description and figure, Linsley (1963) expressed doubt about the placement of the only other *Curius* species at the time of his writing, *C. panamensis*. Our detailed examination of the pronotal and prosternal punctation of *C. dentatus*, *C. panamensis*, *C. punctatus*, and *C. chemsaki*, revealed a new synapomorphy for the genus overlooked by previous workers, male-specific gland pores (rounded, elevated tubercles with circular median impressions).

Notes on sexual dimorphism seen in gland pores: Sexual dimorphism in pronotal and/or prosternal punctation has been noted in morphological descriptions of cerambycine species from several tribes (e.g. LeConte, 1873; Casey 1912; Dusham, 1921; Linsley, 1963; Mermudes & Napp, 2000; Mermudes & Napp, 2004; Monné & Napp, 2005; Micheli & Nearn, 2005; Nearn & Steiner, 2006). Within taxonomic literature, male-specific punctures have not previously been linked to aspects of natural history or behavior. We here include the presence of male-specific pheromone gland pores as a morphological character and suggest that the presence of gland pores may indicate that volatile pheromones play a role in the reproductive behavior of this species. Histology and SEM studies of three cerambycine species revealed that male-specific punctures contain gland pores that are pheromone release sites (Iwabuchi, 1986; Nakamuta et al., 1994; Noldt et al., 1995). We have identified male-specific gland pores (rounded, elevated tubercles with circular median impressions) on the pronota and prosterna of *C. chemsaki* (Fig. 2c), as well as on the pronota and prosterna of males of *C. dentatus*, *C. panamensis*, and *C. punctatus* (unpublished data). In addition, we have identified male-specific gland pores

with a different morphological structure on the prosterna of another curiine, *Plectromerus dentipes* (Olivier, 1790) (unpublished data). Volatile pheromone production by curiine species is supported by the presence of *C. dentatus* in traps baited with synthetic pheromone (Lacey et al., 2004). A recent morphological survey by Ray et al. (2006) used SEM to identify male-specific gland pores in 50 additional cerambycine species, suggesting gland pores are an informative morphological character that provides information about natural history.

### Key to Species of *Curius* Newman

- 1 Fifth antennomere equal to or only slightly longer than fourth ..... 2  
 1' Fifth antennomere about twice as long as fourth ..... 3  
 2(1) Antennae not distinctly flattened; apical half of femora distinctly darker than basal half; body length 5.5–10 mm (SE USA) ..... *dentatus* Newman (Fig. 1c)  
 - Antennae distinctly flattened; femoral apices (knees) distinctly darker; body length 9–12.5 mm (Cuba) ..... *punctatus* (Fisher) (Fig. 1d)  
 3(1') Third antennomere armed with spine, equal to or slightly shorter than fifth; pronotum and elytra clothed with short, pale, recumbent, moderately dense hairs, body length 6.5–15 mm (Panama) ..... *panamensis* Bates (Fig. 1e)  
 - Third antennomere without spine, slightly longer than fifth; pronotum and elytra not as above; body length 7.5–8.6 mm (Venezuela) ..... *chemsaki*, new species (Fig. 1a, b)

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