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, atractante 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 (= Curi) with *Curius* as the type genus and synonymized *Plectromerus concinnatus* Haldeman, 1847 with *C. dentatus*. Linsley (1963)

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 curine 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 Nearns 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 20x 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

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 ferrugineus. 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 ferrugineus 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 ferrugineus. 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, ferrugineus, lateral vittae arranged as follows: one at basal half, two at apical half (Fig. 1a); punctuation 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.
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
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 punctuation 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 punctuation 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 punctuation has been noted in morphological descriptions of cerambycine species from several tribes (e.g. LeConte, 1873; Casey 1912; Dushman, 1921; Linsley, 1963; Mermudes & Napp, 2000; Mermudes & Napp, 2004; Monné & Napp, 2005; Micheli & Nearns, 2005; Nearns & 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 prostates of _C. chemsaki_ (Fig. 2c), as well as on the pronota and prostates 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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Literature cited


