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Weevils of the genus *Cercopeus* Schoenherr from South Carolina, USA
(Coleoptera: Curculionidae: Entiminae)

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Weevils of the genus *Cercopeus* Schoenherr from South Carolina, USA
(Coleoptera: Curculionidae: Entiminae)

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Abstract. Six new species of the weevil genus *Cercopeus* Schoenherr are described from South Carolina: *C. alexi*, *C. cornelli*, *C. femoratus*, *C. paulus*, *C. skelleyi*, and *C. tibialis*. Three other species also found in South Carolina are redescribed: *C. chrysorrhoeus* (Say), *C. maspavancus* Sleeper, and *C. strigicollis* Sleeper. Keys to known males and females of all 17 species of *Cercopeus* are given, along with photographs of habitus, leg features, and antennae, and line illustrations of genitalia. Nearly all specimens of the new species were collected from January-March and these species are winter active.

Key words. *Cercopeus*, Curculionidae, Entiminae, new species, leaf litter, key.

Introduction

Cercopeus Schoenherr (1843) is a genus of small (2.0-5.1 mm) flightless weevils placed in the Entiminae, Trachyploeini (Alonso-Zarazaga and Lyal 1999). They may be identified by the combination of the following traits: metathoracic episterna concealed, no suture apparent; scrobes superior, short and deep, not reaching eye; and epistoma large (Sleeper 1955). These weevils are all dull-colored, the rostrum is about as long as the head and with the dorsal margin slightly curved, the pronotum is rounded to subquadrate, and the elytra are oval without distinct humeri (Ciegler 2010). The scutellum is minute and scarcely visible, whereas the elytral sutural line and ten elytral striae are completely visible. Previously, 11 species of *Cercopeus* have been described, all from the eastern to central United States (O'Brien and Wibmer 1982). Most of those species were described by Sleeper (1955), but additional species were described by Burke (1963) and O'Brien (1977). Three species were recorded from South Carolina. Little is known about the life history of *Cercopeus* species, but other weevils in the Entiminae are root feeders, their larvae living below ground. *Cercopeus* adult weevils are generally found in leaf litter, and some specimens have been found on the leaves of *Vaccinium* Linnaeus (Ericaceae) and *Mitchella* Linnaeus (Rubiaceae) (CWOB, personal observation) but little else is known of their biology.

Sleeper (1955) designated a neotype for *Cercopeus chrysorrhoeus* (Say), type locality, Pennsylvania. The neotype was a female specimen from Clear Creek, Hocking Co., Ohio, III-24-53, E. L. Sleeper and he placed it in his private collection. This would make the designation invalid unless the neotype were to be placed in an institutional collection, mandatory for all neotypes, and published again to satisfy the ICZN Code, Article 75.3.7 (ICZN 1999). The neotype of *C. chrysorrhoeus* and holotypes of both *C. maspavancus* Sleeper and *C. strigicollis* Sleeper are also in his private collection and not available for study. Paratypes of the latter two species were studied by CWOB, who also studied samples of *C. chrysorrhoeus* identified by Sleeper.

In South Carolina leaf litter has not been extensively explored as a habitat for arthropods. Sampling leaf litter in several locations in the state, particularly in the Sandhills region, has yielded six new species

of this genus bringing the total known in the state to nine. It is likely that additional species will be discovered by further collection of leaf litter from other localities.

Materials and Methods

Collecting locations were selected based on advice from CWOB. The selection criteria for collection sites for the weevils were based on several years of successful collecting of *Cercopeus* species in the southern states of Florida, Georgia, South Carolina, Alabama and Texas. These too were collected in the winter months of December to March and most of the species were taken in sandy areas along roadsides, in turkey oak scrub, sandhills and along edges of oak woodland. Another group of species is associated with the deep litter in beech-magnolia climax forests in the southern states, but not found in South Carolina. Most *Cercopeus* species were collected in the Sandhills, a belt running below the Fall Line parallel to the Atlantic coast; new species were collected in the Tidewater Region near the Atlantic coast and in the Southern Coastal Plain, and in the Piedmont, among other localities.

Leaf litter was collected, sifted through 12.7 mm (0.5 inch) mesh, and placed in Berlese funnels for one to two days with an incandescent light bulb (60-150 watts) providing the heat for extraction. Beetles were collected into propylene glycol, sorted using 10× magnification, placed into 70% isopropanol, and mounted on paper points. Specimens for genital study were kept wet in 70% isopropanol with a few drops of glycerol added. Genital extraction was performed by heating the abdomen in 10% potassium hydroxide for 10 minutes, then clearing it in glacial acetic acid for another 20 minutes. After washing the abdomen in 95% ethanol, the dissection was made in glycerine on a microscope slide.

Line drawings of internal structures were traced from digital images taken through a Leica MZ16 stereomicroscope (magnification: 7–115×) or an Olympus BX41 compound microscope (magnification: 20–400×), each equipped with an ocular graticule for measurements of lengths. The structures were redrawn using Adobe™ Illustrator™, highlighting features with taxonomic significance. The morphological terminology follows specific terms adopted to characterize male and female terminalia (Thompson 1992; Howden 1995; Velásquez de Castro 1997; Wanat 2007) (Fig. 34-48).

Color photographs were taken with Syncroscopy Automontage, and black-and-white photographs with a SONY Cyber-shot DSC-P93A digital camera mounted on a trinocular microscope; all were retouched with Adobe™ Photoshop™ 5.5. Habitus photographs include dorsal and lateral views of both male and female where known, and a life-size silhouette.

Specific collection data are presented only for South Carolina records and come from the collections below. Label data are presented verbatim for holotypes. All other label data may be corrected for clarification with updating indicated with brackets. The following codens are used to indicate the collection in which the specimens are deposited:

- BMNH The Natural History Museum, London, United Kingdom.
- CASC California Academy of Sciences, Golden Gate Park, San Francisco, CA.
- CMNC Canadian Museum of Nature Collection, Ottawa, ON, Canada.
- CUAC Clemson University Arthropod Collection, Clemson, SC.
- CWOB Charles W. O'Brien Collection, private, Green Valley, AZ.
- FSCA Florida State Collection of Arthropods, Gainesville, FL.
- JCCC Janet C. Ciegler Collection, private, West Columbia, SC.
- JFCC James F. Cornell Collection, private, Charlotte, NC.
- SCSM South Carolina State Museum, Columbia, SC.
- USNM National Museum of Natural History, Smithsonian Institution, Washington, DC.

Taxonomy

The following keys, separated according to gender, were modified from Sleeper (1955), Burke (1963) and O'Brien (1977). *Cercopeus* males can be differentiated from females by their narrower elytra and abdomen, and their more or less concave metasternum and first visible abdominal sternum. In nine of the eleven previously described species of *Cercopeus*, only females are known; however, both males and females of these six new species were found. Both sets of keys treat all species now known from the USA,

although only species found in South Carolina are treated further. The male key treats the eight species with known males and the female key treats the 17 species known. Lengths included in the keys are for pronotum plus elytron for most species and for total length including head for those species from Sleeper (1955).

The descriptive approach largely follows the format and style of O'Brien (1977). Terminology and spelling follow the Torre-Bueno Glossary of Entomology (Nichols 1989). Body length is measured along the midline of the pronotum plus elytron (except in the keys; see above).

Key to known males of *Cercopaeus*

1. Foretibia straight on outer margin (may be sinuate or toothed on inner margin) 2
- Foretibia slightly to markedly curved or bent 4
- 2(1). Midfemur enlarged, with two (or one) rounded knob-like processes at apical third (Fig. 16); pronotum striate; length 3.8-4.5 mm *C. femoratus* n. sp.
- Midfemur unmodified; pronotum punctate; length 2.3-3.0 mm 3
- 3(2). Pronotum subquadrate, widest at basal third, sides straight, scales contiguous with wide median and lateral pale vittae; length 2.3-2.7 mm; TX *C. isquitus* Sleeper
- Pronotum rounded, widest at middle, sides evenly curved, scales not contiguous, integument apparent, most specimens lacking pale vittae; length 2.4-3.0 mm; SC *C. paulus* n. sp.
- 4(1). Foretibia markedly curved (Fig. 17); forefemur greatly enlarged, some specimens with ventral tooth at apical third; midfemur with one or two blunt teeth ventrally near apex 5
- Foretibia slightly curved; forefemur enlarged or not but without ventral tooth; midfemur unmodified 6
- 5(4). Inner margin of foretibia with two spines enclosing circular notch (Fig. 18); pronotum striate ...
..... *C. tibialis* n. sp.
- Inner margin of foretibia sinuate, denticulate, with apicoventral tooth; pronotum punctate, most specimens with median longitudinal glabrous area *C. alexi* n. sp.
- 6(4). Inner margin of foretibia with large triangular tooth at basal third (Fig. 19); lateral margins of prothorax narrowly rounded (Fig. 26); length 4.0-4.4 mm *C. cornelli* n. sp.
- Inner margin of foretibia slightly to moderately sinuate, without tooth; lateral margins of prothorax broadly rounded; length 2.7-3.9 mm 7
- 7(6). Pronotum slightly wider than long; integument reddish brown; length 2.7-3.0 mm; north FL, south GA *C. komarecki* O'Brien
- Pronotum slightly longer than wide; integument dark brown; length 3.2-4.3 mm; SC
..... *C. skelleys* n. sp.

Key to known females of *Cercopaeus*

1. Foretibia with small anteapical spine on outer margin (Fig. 20); sides of pronotum evenly rounded 2
- Foretibia without anteapical spine on outer margin; sides of pronotum various 4
- 2(1). Head in lateral view with tumidity above antennal insertion and above vertex, concave between tumidities; eyes placed more dorsally than usual, in lateral view close to dorsal margin (Fig. 27); length 3.2 mm; VA *C. simius* Sleeper

- Head in lateral view with dorsal edge straight or evenly curved; eye placement normal; widespread in eastern U.S. **3**
- 3(2). Pronotum striolate, slightly tumid; larger, length 3.7-5.1 mm ***C. strigicollis* Sleeper**
 – Pronotum punctate, at most with weakly developed striae, not tumid; usually smaller, length 3.3-4.3 mm ***C. chrysorrhoeus* (Say)**
- 4(1). Foretibia with outer apical margin markedly produced and acutely angulate (Fig. 21), inner margin denticulate; length 3.9-4.9 mm **5**
 – Foretibia with outer apical margin rounded or rectilinear, not or slightly produced (Fig. 22); inner margin and length various **6**
- 5(4). Reddish brown; pronotum distinctly tumid in middle ***C. maspavancus* Sleeper**
 – Dark brown; pronotum not tumid ***C. cornelli* n. sp.**
- 6(4). Pronotum with median carina or spine at middle of basal margin, many specimens with median longitudinal glabrous ridge or carina (Fig. 24); pronotum not markedly striolate **7**
 – Pronotum simple, without median spine, glabrous ridge, or carina; pronotum striolate or not... **10**
- 7(6). Foretibia markedly curved, inner apical margin produced; length 3.6 mm; AR, IL, MI ***C. schwarzi* Sleeper**
 – Foretibia straight, inner apical margin rounded **8**
- 8(7). Pronotal carina prominent at base and in apical third; elytral striae deeply impressed; length 2.9 mm; TX ***C. bolli* Burke**
 – Pronotal carina or spine restricted to basal fifth or barely evident; elytral striae shallowly or not impressed; SC **9**
- 9(8). Pronotal carina prominent basally, short but noticeably extended onto pronotal disc; lateral margins of pronotum narrowly rounded (Fig. 26) ***C. alexi* n. sp.**
 – Pronotal carina tiny, blunt basal spine not extended onto pronotal disc; lateral margins of pronotum broadly rounded ***C. skelleyi* n. sp. (in part)**
- 10(6). Pronotum with disc markedly striate, individual punctures nearly effaced **11**
 – Pronotum with punctures apparent, some elongate and in part confluent, striae present or not **13**
- 11(10). Smaller, length 3.0-3.6 mm; elytral striae punctures very small; proepipleuron punctate; midwestern U.S. (AR, OK) ***C. clispus* Sleeper**
 – Larger, length 3.6-5.0 mm; elytral striae punctures near basal fourth as wide as intervals; proepipleuron striate; southeastern U.S. **12**
- 12(11). Foretibia with outer apical margin triangularly produced, apex straight (Fig. 22), without ventral process ***C. femoratus* n. sp.**
 – Foretibia with outer apical margin and apex rounded, with ventral process apparent in lateral view (Fig. 23) ***C. tibialis* n. sp.**
- 13(10). Pronotum substriate, punctures and striae both apparent **14**
 – Pronotum punctate, completely without striae **15**
- 14(13). Base of pronotum with small median spine; length 3.5-4.3 mm; SC ***C. skelleyi* n. sp. (in part)**

- Base of pronotum uniformly rounded, without spine; length 2.7-3.0 mm; north FL, south GA...
..... *C. komarecki* O'Brien
- 15(13). Pronotum markedly constricted apically, subquadrate with subparallel sides; elytra scale pattern formed with black and white rectangular maculae surrounding median discal area; length 2.3-2.7 mm *C. isquitus* Sleeper
- Pronotum at most somewhat constricted apically, sides distinctly rounded; elytral pattern various but not with quadrate maculae; length 2.0-3.5 mm **16**
- 16(15). Pronotum and elytra with moderately dense, fine, erect setae; midwestern U.S. **17**
- Pronotum and elytra with dense, coarse, erect, bristle like setae; southeastern U.S. (SC)
..... *C. paulus* n. sp.
- 17(16). Pronotum slightly wider than long, very finely, closely, deeply punctate, intervals between punctures raised, giving granular appearance; length 2.0-3.0 mm; AR, IA, IL, IN, MO, OH
..... *C. chisaius* Sleeper
- Pronotum slightly longer than wide, very coarsely, closely punctate surface not granular in appearance; length 3.0-3.5 mm; IN, OH, WI..... *C. confusor* Sleeper

***Cercopeus alexi* O'Brien, Ciegler and Girón, new species**

(Fig. 1, 2, 17, 24, 28, 34, 40)

Diagnosis. Body elongate-oval to broad-oval; integument shining, dark reddish brown to black; clothed with black, brown, and few whitish tan to white, oval to elongate-oval, recumbent scales; some with scales predominantly grayish white with large basal black and brown elytral macula; and with moderately dense, distinct, subrecumbent, moderately coarse setae.

Description. Holotype female. Length, pronotum and elytron: 5.30 mm. Width, elytra: 3.00 mm. **Rostrum** weakly curved, dorsal line scarcely curved in lateral view, basal 1/3 flattened, middle 1/3 convex, weakly curved, and apical 1/3 weakly depressed; dorsomedian area flattened, weakly narrowly impressed from base to apical 1/3; basal 2/3 densely clothed with scales not completely concealing large punctures; raised margins of elongate contiguous punctures evident among scales; apical 1/3 subglabrous with coarse, substriate punctures and moderately sparse, elongate golden brown, suberect setae; with nasal plate sharply defined, not carinate or punctate. **Head** with frons strongly transversely impressed, with shallow median fovea; densely clothed with large elongate gray to brown scales, nearly concealing substriate punctures; punctures behind frons striate, smaller, with smaller sparse scales; eyes broad-oval, moderately strongly convex. **Antennae** moderately stout; scape moderately clavate, with moderately dense, elongate, recumbent scales and moderately dense, long, coarse, suberect setae; funicular antennomere 1 oval, about 0.11× longer than 2 and 0.17× wider, 3, 6, and 7 subequal in length, 0.50× as long as 1, 4-5 subequal in length, 0.40× as long as 1; club short, broad-oval (Fig. 28). **Prothorax** not transverse, 0.97× as wide as long, widest at basal 1/4; at apical 1/4 sides suddenly strongly obliquely divergent from moderately strong subapical constriction, thence in relatively straight line to basal 1/4, then suddenly narrowed to carinate truncate base; disc on median 3/4 striate, with large and small contiguous deep substriolate punctures, with brown recumbent scales not concealing punctures, median few striae raised higher and forming slightly elevated carina-like smooth median line from apex to middle; with basal, triangular, median, subacute, short process; laterally with denser round recumbent tan to white scales, nearly concealing all punctures, except few seta-bearing punctures; disc becoming moderately strongly curved laterally; lateral margins of disc in lateral or anterior view forming distinct rounded edge; sides rugosely, granularly coarsely punctate with dense, grayish and brownish, round to oval, recumbent, plumose scales, paler on inflexed pleuron; disc with moderately dense, long, coarse, subrecumbent setae. **Elytra** elongate broad-oval, broadest at basal 1/4 behind rounded humeri with sides roundly evenly narrowed to rounded apex; median area of disc mottled dark brown and black, bordered by narrow dark brown fascia and pale tan to brown uneven broad fascia of scales covering entire declivity

and apex; lateral inflexed areas moderately densely clothed with elongate, moderately fine, seta-like, recumbent scales and some recumbent setae; strial punctures shallow, elongate and indistinct, nearly concealed by dense scales, separated by one or two diameters of puncture; intervals uneven in width, flat, each with one to three rows of moderately fine, subrecumbent and suberect setae, and dense, round to oval, imbricate recumbent scales, intervals 9-10 glabrous above middle and hind femora. **Legs** stout; femora strongly clavate; with dense, recumbent scales and suberect, fine setae; foretibia externally apically roundly expanded, with nine spines and stout acute mucro; nearly straight with moderate sinuate inner curvature; inner margin not denticulate; hind tibia with two blunt stout anterior apical spines, and outer margin with 15 moderately long coarse sharp pale spines becoming longer posteriorly. **Venter** with dense to sparse noncontiguous recumbent plumose scales on pro-, meso-, and metasternum, and on articulating surfaces of all coxae; medial area of metasternum and all abdominal sterna with moderately dense, fine, recumbent setae; same areas with dense, coarse punctures; abdominal sternum I transversely impressed between hind coxae, strongly convex behind, 0.83× as long as II; II very weakly convex, and 1.25× as long as subequal weakly convex III + IV; V subequal in length with II and moderately concave in apical third. **Genitalia:** Tergum VII (Fig. 40a) 1.2× wider than long, with anterior margin rounded, 1.4× wider than posterior margin, lateral margins nearly straight, apical margin emarginate, surface with setae on apical fourth; in lateral view, dorsal outline straight. Tergum VIII (Fig. 40b) 1.8× wider than long, with anterior margin emarginate and lateral margins convergent, nearly straight; posterior margin rounded, with setae on apical third. Sternum VIII (Fig. 40c) 0.6× length of sterna I-V together, spear-shaped, with lamina 1.7× longer than wide, rounded at apex and corners, with apicolateral area and median basolongitudinal region more sclerotized than basilateral regions, with three lateral submarginal setae. Coxites + styli (Fig. 40d) slightly shorter than lamina of sternum VIII; coxites with one apical and one pre-apical pair of setae; styli apically inserted, 1.7× longer than basal width, with two apical groups of setae. Genital chamber 0.8× length of sternum VIII. Spermatheca (Fig. 40e) 1.7× longer than wide, j-shaped; cornu straight; corpus slightly swollen between cornu and collum; ramus apically truncate, laterally rounded; collum apically rounded, duct inserted near ramus; surface reticulate.

Allotype male. Same as female holotype except: Length, pronotum and elytron: 4.20 mm. Width, elytra: 2.20 mm. **Prothorax** narrower, 0.91× as long as wide; with sides more evenly rounded, widest at middle, medial 1/4 of disc substriate, with narrow nearly straight to slightly curved ridges formed by coalescent to contiguous punctures. **Elytra** elongate-oval, broadest behind rounded humeri at basal 1/5, then sides subparallel to just anterior of declivity, and evenly narrowed to rounded apex. **Legs** with midfemur with subapical, strong, blunt, internal tooth; foretibia more slender and less sinuate, swollen moderately in basal 1/3, there strongly narrowed and internally strongly curved to apex, internal margin flattened and shallowly grooved with small blunt tuberculate denticles on anterior margin along curve; apical margin narrowly rounded with seven short subacute to blunt spines; midtibia with subapical, interior, large, long, blunt spine; hind tibia with one stout, anterior, apical spine and outer margin with seven short, blunt, pale spines, and seven posterior, longer, moderately coarse, subacute, pale spines. **Venter** with abdominal sternum I broadly very deeply impressed, impression scarcely continuing on basal edge of weakly convex sternum II; sternum V evenly weakly convex; abdominal sterna with short to long, sparse, fine, recumbent setae on basal area, with fine sparse punctures; apical areas glabrous and more finely punctate. **Genitalia:** Tergum VIII (Fig. 34a) nearly as wide as long, with anterior margin rounded, mesally acutely emarginate, 1.4× wider than posterior margin, lateral margins convergent from basal third, posterior margin slightly rounded, surface lightly sclerotized on basal region, with setae in posterior half; in lateral view (Fig. 34b), dorsal outline sinuate. Sternum VIII forming entire membranous plate, 0.5× width of posterior margin of tergum VIII, with apodeme (spiculum relictum) bean-like, distally 1.8× wider than long, darkened. Sternum IX (spiculum gastrale, Fig. 34c) with basal plate bifurcate, forming two opposed rhombi, nearly 2.2× longer than wide each; apodeme nearly 0.6× width of aedeagus in lateral view, 1.6× length of aedeagus. Tegmen (Fig. 34d) with tegminal apodeme slightly shorter than aedeagus; basal piece connate with tegminal plate; tegminal plate with mesal narrow triangular projection, posteriorly directed. Aedeagus in dorsal view (Fig. 34e) 2.8× longer than its mesal width, lateral margins subparallel; apex (Fig. 34f) rounded; in lateral view (Fig. 34g) dorsally convex, 4.3× longer than mesal width. Endophallus with pair of sub-apical sclerotized plates closing the ostium. Aedeagal apodemes 1.4× length of aedeagus.

Intraspecific variation. The length (pronotum and elytra) ranges from 3.1 to 5.3 mm, the width from 1.6 to 3.0 mm. The pronotum may or may not have a glabrous median line or carina. The scale pattern of the male specimens ranges from two incomplete rows of pale scales on the elytra and a lateral row on the pronotum (Fig. 1), to solid dark scales with pale scales only on the base of the fifth elytral interval and a corresponding short line on the base of the pronotum; the median area of the elytral disc may have dark or light brown scales. Females do not vary much in the color or pattern of scales. The midfemur of the male generally has one spine, but some specimens have a second small spine closer to the apex; the large spine may be slender and pointed or wide and blunt.

Remarks and comparative notes. Males of this species are unique in having tubercles on both the midfemur and midtibia. Females are similar to *C. paulus* but differ in having a basal process of the pronotum and they are very similar to females of *C. skelleyi* which lack the strongly striolate pronotum.

Range. Known only from three localities in South Carolina in both the Southern Coastal Plain and the Piedmont.

Materials examined. On hand for this study were 72 specimens, 36 males and 36 females.

Holotype female (deposited in CASC, on long-term loan to CWOB) and 2 paratypes: "USA SC CALHOUN CO NR St. Matthews Dolin Hill 33° 40.18'N, 80° 43.30'E 324' el 5Ap08 J.Cornell,BGregory,DWessinger, siftberldebr W/Cladonia rangifer".

Paratypes. Same holotype except, berlsoil, litter20"d pineStumphole 36" deep (1). S[outh]C[arolina]: Calhoun Co., Wannamaker Nat[ure] Pr[eserve], St. Matthews, In Leaf Litter, Apr. 2, 2010(1); same except 16-IV-2010, N33°38.447', W80°42.567'/ J. C. Ciegler, berlese, sifted, near logs (4); same except N33°38.498', W80°42.786' / beech, oak, tulip (1); same except 21-IV-10, N33°38.447', W80°42.567'/ near logs (5); same except N33°38.498', W80°42.786' (41)/ beech, oak, tulip (41); same except 29-V-10 (3); S[outh] C[arolina]: Charleston Co., Santee Coastal W[ildlife] M[anagement] A[rea], 23-IV-07, N33°09.315', W79°22.093'/ J. C. Ciegler, berlese, sifted, base of live oak (ALLOTYPE MALE); same except 3-II-2008, N33°09.296', W79°22.083' (1); same except N33°09.278', W79°22.085' (11); same except N33°09.280', W79°22.059' (2). Paratypes also are in the following collections: BMNH, CASC, CMNC, CUAC, CWOB, FSCA, JCCC, JFCC, SCSM, and USNM.

Etymology. This species is named in honor of the late Dr. Alex Ciegler, scientist, naturalist, conservationist and beloved husband of second author, Mrs. Janet Ciegler.

Cercopeus chrysorrhoeus (Say, 1831)

(Fig. 3, 20, 41)

Diagnosis. Body broad-oval; integument shining, dark reddish brown; clothed with dark brown, light brown, and whitish tan, oval to round recumbent scales without obvious pattern, some specimens heavily encrusted, obscuring scales; and with moderately dense, erect, coarse, bristle-like setae.

Description. Female. Length, pronotum and elytra: 3.5-4.3 mm. Width, elytra: 1.75-2.40 mm. **Ros-trum** shorter than head, thick, nearly straight, slightly tapered to apex; dorsal contour curved in lateral view, apical 1/3 weakly depressed; dorsomedian area broadly, shallowly impressed; basal 2/3 clothed with light brown scales concealing punctures; apical 1/3 glabrous with elongate punctures and moderately sparse, elongate, suberect, pale setae; with nasal plate moderately to poorly defined, not carinate or punctate. **Head** with frons with shallow median fovea; frons densely covered with scales similar to scales on base of rostrum; vertex glabrous or scaly; occiput shiny with tiny scales in elongate substrate punctures; eyes oval, ventral margin flattened, nearly flat in dorsal view. **Antennae** moderately slender, scape gradually widened to apex, straight or nearly so, with dense recumbent scales and sparse long suberect setae; funicular antennomere 1 clavate, slightly longer than 2, 3 half the length of 2, slightly longer than wide, 4-7 moniliform and 3/5 as long as 2; club broad-oval, about as long as funicular antennomeres 1 + 2. **Prothorax** 1.08× wider than long, sides markedly rounded, widest 2/5 from base,

slightly constricted toward apex, base wider than apex; lateral margins moderately angulate in anterior view; disc on median 3/4 with large contiguous elongate substriolate punctures, each with round to elongate pale to dark scale, laterally with wide vitta of paler scales, inflexed area of pleuron with dark brown scales; disc with pale fine to moderately coarse, elongate, suberect setae; margins with moderate to coarse dark setae. Elytra short broad-oval, 0.74× as wide as long, broadest 1/5 to 2/5 from base behind rounded humeri, sides roundly evenly narrowed to slight constriction near apex, apices conjointly rounded; disc and inflexed area mottled with vague v-shaped paler area from humeri to 1/3 from apex; striae with deep round punctures separated by more than own diameters, each with small elongate scale not concealing puncture; intervals equal in width, nearly flat, with moderate-sized imbricate scales, becoming plumose on sides, all with single row of long suberect setae. **Legs** stout; femora moderately clavate with small, noncontiguous, recumbent scales and, fine, elongate, subrecumbent setae; foretibia nearly straight with inner margin sinuate, not denticulate, externally with small apical spine and anteapical spine 1/6 from apex (Fig. 20), apex internally produced as large triangular mucronate process; hind tibia with two blunt stout apical spines, and outer margin of apex with 12 short sharp pale spines becoming longer posteriorly. **Venter** with sparse, noncontiguous, recumbent, plumose scales on pro-, meso-, and metasternum; abdominal sterna shiny with pale, recumbent, plumose scales marginally, nearly glabrous medially with pale fine subrecumbent setae, and both coarse and very fine punctures; abdominal sternum I transversely convex, 1.5× as long as II; II slightly convex posteriorly, as long as III + IV together; III + IV weakly convex; V as long as II with broadly rounded apex, nearly flat with slight transverse impression. **Genitalia:** Tergum VII (Fig. 41a) 1.1× wider than long, with anterior margin slightly rounded, 1.3× wider than posterior margin, lateral margins nearly straight, apical margin emarginate, surface with setae on apical fourth; in lateral view, dorsal outline straight. Tergum VIII (Fig. 41b) 1.1× wider than long, with anterior margin emarginate and lateral margins convergent, straight; posterior margin emarginate, with submarginal setae. Sternum VIII (Fig. 41c) 0.8× length of sterna I-V together, spear-shaped, with lamina 3× longer than wide, rounded at apex and corners, with apicolateral area and median basolongitudinal region more sclerotized than basilateral region, with two lateral submarginal setae. Coxites + styli (Fig. 41d) 0.8× length of lamina of sternum VIII; coxites with one apical seta and two preapical shorter setae; styli 3× longer than basal width, with three setae, apically inserted. Genital chamber 0.9× length of sternum VIII. Spermatheca (Fig. 41e) 1.5× longer than wide, j-shaped; cornu straight; ramus and collum similar in size and shape, apically truncate, laterally rounded; duct inserted apically; surface not particularly sculptured.

Male. Unknown.

Remarks and comparative notes. This is a highly variable distinctive species with diverse color patterns, not to be confused with species which lack the anteapical spine of the foretibia. *Cercopeus strigicollis*, with an anteapical spine, is larger and has distinct prothoracic striolae. Although some individuals of both species overlap in length, the more robust, rounded, convex body of *C. strigicollis* makes it appear much larger.

Range. AL, AR, DC, GA, IN, KY, MA, MD, MI, NC, NJ, NY, OH, PA, SC, TX, VA, WV (O'Brien and Wibmer 1982).

Materials examined. South Carolina: Calhoun Co., St. Matthews (1) (CWOB), (1) (JCCC); Florence Co., Florence (8) (CUAC); Greenville Co., Greenville (1) (CWOB); Newberry Co., Joanna (1) (JFCC); Pickens Co., Clemson (6) (CUAC), Liberty (1) (CUAC), Nine Times (1) (JCCC); Richland Co., Ballantine (1) (JCCC); Sumter Co., Woods Bay State Park (1) (CWOB).

***Cercopeus cornelli* O'Brien, Ciegler and Girón, new species**
(Fig. 4, 5, 19, 29, 35, 42)

Diagnosis. Body elongate broad-oval; integument shining, dark reddish brown; clothed with brownish black, brown, and few whitish tan to white, oval to elongate-oval, recumbent scales, some with scales

predominantly dark brown with pale brown sparse maculae in uneven elytral fascia; and with moderately dense, distinct, suberect, moderately coarse setae.

Description. Holotype female. Length, pronotum and elytron: 3.80mm. Width, elytra: 2.0 mm. **Rostrum** weakly evenly curved, dorsal line nearly flat in basal 2/3 in lateral view; median area medially not impressed from base to apical 1/3; basal 2/3 densely clothed with large, imbricate, tan to white, recumbent scales; scales not concealing large punctures, apical 1/3 clothed with dense, not contiguous, small, round, shining, recumbent scales and with coarse, moderately dense, elongate, white, suberect setae; nasal plate sharply defined, not carinate or punctate. Head with frons with small, median, round, deep fovea; latter surrounded by large shallow impression, densely clothed with large to medium-sized white to pale tan scales, not concealing large rugosely striate punctures; punctures behind frons striate, smaller, with smaller sparse scales; eyes elongate-oval, moderately weakly convex. **Antennae** moderately stout; scape moderately clavate, with sparse elongate recumbent scales, and moderately dense long coarse suberect setae; funicular antennomere 1 nearly round, about 0.12× longer than 2 and 0.50× wider, 3-6 subequal in length, moniliform, 7 slightly longer than 6; club short, broad-oval (Fig. 29). **Prothorax** not transverse, 0.96× as wide as long, base without collar, sides widest at middle, strongly evenly rounded from base, narrowed to short gradually subtubulate apex; disc completely striate-punctate, medial 4/5 with small round to large elongate punctures forming narrow striae, with oval to round recumbent mainly brown scales in and not concealing most punctures, lateral margins in part with denser round recumbent grayish scales partially concealing striae; striae straight medially from apex to straight base, lacking basal process, and becoming weakly curved laterally; prothorax in lateral or anterior view without distinct angulate margins; inflexed area of pleuron rugosely, coarsely punctate with sparse, grayish, elongate, pointed, plumose, recumbent scales; disc with moderately dense, long, fine, mostly dark, subrecumbent setae; scales not forming distinct pattern. **Elytra** broad-oval, 1.22× as long as broad, broadest just behind rounded humeri, then sides narrowed gradually in almost straight line to declivity and evenly narrowed to rounded apex; median area of disc dark brown to black, with pale tan to whitish uneven moderately broad fascia of recumbent scales inside and including humeri and along side margins and declivity; inflexed lateral area completely clothed with similar but pale grayish, recumbent scales; striae punctures deep round and distinct, separated by own diameter; intervals uneven in width, flat, each with one or two uneven rows of moderately fine, subrecumbent setae, and dense, round to oval, imbricate to contiguous, recumbent scales. **Legs:** Forefemur very stout, other femora very moderately clavate; with dense, mostly contiguous, pale grayish, recumbent scales and suberect, fine setae; foretibia externally apically expanded, with eight spines, flattened internally with short, blunt mucro; curved with moderately strong, subapical, inner curvature; inner margin strongly sinuate in basal 1/3 and denticulate with small rounded tubercles; hind tibia with two long, acute, stout, anterior, apical spines, and outer margin with about 15 short, coarse, moderately sharp, reddish brown spines, with only last two or three somewhat longer posteriorly. **Venter** with dense to sparse noncontiguous recumbent plumose scales on pro-, meso-, and metasternum, sparse on abdominal sterna, slightly denser laterally and on apical margins, and on articulating surfaces of all coxae; abdominal sterna all with moderately dense, fine, recumbent setae; thoracic sterna with dense, coarse punctures; abdominal sterna with variable-sized, sparser, finer punctures; abdominal sternum I convex, not transversely impressed between hind coxae, 1.11× as long as II; II convex and 1.35× as long as subequal weakly convex III + IV; V about 0.89× as long as II and broadly transversely concave in apical third. **Genitalia:** Tergum VII (Fig. 42a) 1.5× wider than long, with anterior margin rounded, 1.8× wider than posterior margin, lateral margins nearly straight, posterior margin emarginate, surface with setae on apical fourth; in lateral view, dorsal outline straight. Tergum VIII (Fig. 42b) with anterior and lateral margins nearly straight; lateral margins convergent; anterior margin 3× wider than posterior margin; posterior margin rounded, with setae on marginal area. Sternum VIII (Fig. 42c) 0.7× length of sterna I-V together, spoon-shaped, with lamina 1.9× longer than wide, rounded at apex, with apicolateral area and median basolongitudinal region more sclerotized than basilateral regions, with 1-3 lateral submarginal setae. Coxites + styli (Fig. 42d) slightly shorter than lamina of sternum VIII; apex of coxites with two anteapical and two slightly longer apical setae; styli apically inserted, 1.8× longer than basal width, apically slightly rounded, with seven apical setae. Genital chamber 0.8× length of sternum VIII. Spermatheca (Fig. 42e) 2.1× longer than wide, j-shaped; cornu straight;

corpus slightly swollen at base of cornu; ramus projected, apically truncate, laterally rounded; collum apically rounded; surface reticulate.

Allotype male. Same as female holotype except: Length, pronotum and elytron: 4.00mm. Width, elytra: 2.0 mm. **Rostrum** nearly flat dorsally, very weakly depressed in apical 1/3. **Elytra** elongate-oval, 1.35× as long as broad. **Legs** even stouter, with forefemur more swollen, inner surface in basal 2/3 with dense very long fine setae; foretibia with inner margin in basal 1/3 forming strong subacute tooth-like process, with five or six tuberculate denticles on apical area of process to apex, strongly narrowed and internally curved in apical 1/3 with long fine, erect setae, and with narrow submedian groove on inner surface from large process to apex, apex rounded at outer margin, with nine or ten short blunt spines and long narrow acute mucro; hind tibia with one stout, anterior, apical spine and outer margin with eight long, acute, fine, dark spines, and three, posterior, similar, but short spines. **Venter** with metasternum and abdominal sternum I broadly deeply impressed, impression continuing more narrowly on sternum II; sternum V basally nearly flat, with narrow shallow marginal impression; all abdominal sterna with very long, dense, fine, recumbent setae. **Genitalia:** Tergum VIII (Fig. 35a) 1.3× wider than long, with anterior margin nearly straight, 1.6× wider than posterior margin, lateral margins convergent from basal third, posterior margin truncate, with setae in posterior half; in lateral view (Fig. 35b), dorsal outline sinuate. Sternum IX (spiculum gastrale, Fig. 35c) with basal plate bifurcate, forming two opposed triangles, nearly 1.5× longer than wide each; apodeme 0.6× width of aedeagus in lateral view, 1.5× length of aedeagus. Tegmen (Fig. 35d) with tegminal apodeme slightly shorter than aedeagus; basal piece connate with tegminal plate; tegminal plate with mesal n-shaped projection, posteriorly directed. Aedeagus in dorsal view (Fig. 35e) 3.1× longer than mesal width, lateral margins subparallel; apex (Fig. 35f) narrowly rounded; in lateral view (Fig. 35g) dorsally convex, 4.7× longer than mesal width. Endophallus with pair of subapical sclerotized plates closing the ostium, pair of lateral groups of small denticles near midpoint, and a large group of small denticles positioned anterior of base of aedeagus. Aedeagal apodemes slightly longer than aedeagus.

Intraspecific variation. The length (pronotum plus elytra) ranges from 3.65 to 4.50 mm, the width from 1.85 to 2.40 mm. Otherwise individuals are relatively uniform and show no significant variation.

Remarks and comparative notes. The large triangular tooth on the inner side of the foretibia uniquely identifies males of this species. The broadly triangular apex of the foretibia will distinguish females from all other species except *C. maspavancus*, which has a tumid pronotum and is somewhat larger and more reddish.

Range. Known only from two localities in South Carolina.

Materials examined. On hand for this study were 12 specimens, 7 males and 5 females.

Holotype female, allotype male (in CASC, on long-term loan to CWOB), and two paratypes: "S[outh]C[arolina]: Chesterfield Co., Cheraw, Cheraw SP, N34°38.447', W79°55.483', 7-I-2008/J. C. Ciegler, berlese sifted, lichens, longleaf pine".

Paratypes. Same as holotype except N34°38.35, W79°53.606' / 28-X-2007 (2); same except 7-I-2008, N34°38.371', W79°55.388' (1); same except 10-II-08, N34°38.376', W79°55.394' (1); USA SC CHESTERFIELD / CO. Cheraw St. Pk 27X07 / J&S Cornell Berl. Litter & Soil / w/clumps of *Aristida* sp. (1); same except Berl Old Flood, Debris Juniper Creek (1); same except Berlese Ex Soil, & Reindeer Lichen (1); Florence Co.: Florence, S.C., 15 Jan 1938, F. F. Bondy, Soil Shaker (1). Paratypes are in the following collections: CUAC, CWOB, JCCC, JFCC, SCSM, and USNM.

Etymology. This species is named in honor of our friend and colleague, Dr. James F. Cornell, who collected this and other specimens in this study and graciously made them available to us.

***Cercopeus femoratus* O'Brien, Ciegler and Girón, new species**
(Fig. 6, 7, 16, 22, 25, 26, 30, 36, 43)

Diagnosis. Body elongate broad-oval; integument shining, dark reddish brown; clothed with dark brown, brownish black, and few whitish tan to white, round to elongate-oval, recumbent scales; some with scales predominantly dark brown with pale brown sparse maculae and uneven elytral fascia; and with moderately dense, distinct, suberect, moderately coarse setae.

Description. Holotype female. Length, pronotum and elytron: 4.70 mm. Width, elytra: 2.4 mm. **Rostrum** weakly curved, dorsal line nearly flat in basal 2/3 in lateral view; apical 1/3 weakly depressed; dorsal median area medially narrowly impressed from base to apical 1/3; basal 2/3 densely clothed with large, imbricate, tan to white, recumbent scales, nearly concealing large punctures; apical 1/3 subglabrous, clothed with few small round shining, recumbent scales and with coarse, moderately dense, elongate, suberect setae; nasal plate sharply defined, not carinate or punctate. Head with frons with small median, round, deep fovea in transverse shallow impression at base of eyes nearly concealed by dense cover of large to medium-sized white to pale tan scales; latter not concealing large, rugosely striate punctures; punctures behind frons striate, smaller, with smaller sparse scales; eyes elongate-oval, moderately weakly convex. **Antennae** long, slender; scape weakly clavate, extended beyond anterior margin of pronotum, with very sparse small oval recumbent scales, and moderately dense long coarse suberect setae; funicular antennomere 1 about 0.40× longer than 2 and 0.33× wider, 3 about 0.56× as long as 2, 4-7 moniliform and about 1/2 as long as 2; club elongate, broad-oval (Fig. 30). **Prothorax** transverse, 1.15× as wide as long, subquadrate with sides subparallel, widest near basal 1/5, base with carinate collar; at apical 1/5 narrowed to short subtubulate apex; disc completely striate, with small, moderately sparse, elongate scales in striae, medial 4/5 with strongly developed striae (Fig. 25), lateral margins in part with large denser round recumbent grayish scales partially concealing striae; striae straight medially from apex and onto broad blunt medial basal process, and becoming weakly curved laterally; in lateral or anterior view, disc forming distinct angulate but narrowly rounded margins (Fig. 26); inflexed area of pleuron concave, coarsely striate, strongly rugose above coxa, with moderately dense, recumbent, elongate, pale tan plumose scales and shining, metallic brown scales; disc with moderately dense, long, fine, mostly dark, subrecumbent setae; scales not forming distinct pattern. **Elytra** broad-oval, 1.17× as long as broad, rounded behind humeri, broadest at middle then sides narrowed gradually to declivity and evenly narrowed to rounded apex; median area of disc somewhat set off by significantly darker brown to black scales, surrounded by pale tan interrupted uneven moderately broad fascia of recumbent scales, inside and including humeri and along side margins and declivity; inflexed lateral area completely clothed with moderately dense, small, round to oval, pale brown, recumbent scales; striae punctures deep, round and distinct, separated by own diameter; intervals uneven in width, flat, each with one or two uneven rows of moderately fine, subrecumbent setae, and dense, round to oval, imbricate to contiguous, recumbent scales. **Legs** very stout; femora strongly clavate; with moderately dense, mostly contiguous, pale grayish to brown, recumbent scales and suberect, long, fine setae; foretibia nearly straight, internal margin sinuate with moderately strong, subapical, inner curvature, apex externally expanded as moderate triangle, internally with short, acute mucro, and with eight short stout subacute spines; hind tibia with two long, acute, stout, anterior, apical spines, and outer margin with about 15 short, coarse, moderately sharp, pale brown spines, with only last two or three somewhat longer posteriorly. **Venter** with dense to sparse noncontiguous recumbent plumose scales on pro-, meso-, and metasternum, sparse laterally on abdominal sternum I, and on articulating surfaces of all coxae; abdominal sterna all with moderately sparse fine, recumbent setae; thoracic sterna with dense, moderately coarse punctures; abdominal sterna with variable-sized, sparser punctures; abdominal sternum I flattened, not transversely impressed between hind coxae, 1.32× as long as II; II flat and 1.17× as long as subequal weakly convex III + IV; V subequal in length to II and broadly transversely concave in apical third. **Genitalia:** Tergum VII (Fig. 43a) 2× wider than long, with anterior margin rounded, 1.7× wider than posterior margin, lateral margins straight, posterior margin slightly rounded, surface with setae on apical fourth; in lateral view, dorsal outline straight. Tergum VIII (Fig. 43b) with anterior and lateral margins nearly straight; lateral margins convergent; anterior margin 2.3× wider than posterior margin; posterior margin rounded, with setae on marginal area. Sternum VIII (Fig. 43c) nearly 0.6× length of sterna I-V together, with lamina semihexagonal, 1.8× longer than wide, apically truncate, with apical half and median basolongitudinal region more sclerotized than basilateral region, with 2-3 lateral submarginal setae. Coxites + styli (Fig. 43d) nearly as long as lamina of sternum VIII; apex of coxites with several mid-sized anteapical setae;

styli apically inserted, 2.3× longer than basal width, apically rounded, with one antepical and four apical longer setae. Genital chamber 0.8× length of sternum VIII. Spermatheca (Fig. 43e) 1.2× longer than wide, j-shaped; cornu curved; ramus laterally projected, apically truncate, laterally rounded; collum apically truncate; surface of corpus, cornu, and ramus reticulate.

Allotype male. Same as female holotype except: Length, pronotum and elytron: 3.80 mm. Width, elytra: 2.0 mm. **Elytra** elongate-oval, 1.20× as long as broad. **Legs** even stouter, with forefemur more swollen, entire surface with moderately dense very long, fine subrecumbent setae; midfemur strongly asymmetrically swollen with very large ventrolateral obtuse process with two small blunt apical tubercles; foretibia with outer margin straight, rounded at apex, inner margin beginning at basal 1/3 strongly sinuate, undulate with two bluntly rounded small tubercles, apically broadly flattened, abruptly curved inward at apical 1/7 with large ventral triangular tooth, moderately long stout subacute mucro, and six short blunt pale spines; hind tibia with one stout, anterior, apical spine and outer margin with 12 long to short, acute, fine, pale spines, longest apically, gradually shorter to shortest at base of stout, moderately long, subacute mucrone. **Venter** with abdominal sternum I broadly moderately deeply impressed, impression barely continuing basally more narrowly on sternum II; sternum V basally nearly flat, with narrow shallow marginal impression; all abdominal sterna with very long, dense, fine, subrecumbent setae. **Genitalia:** Tergum VIII (Fig. 36a) 2.1× wider than long, with anterior margin deeply roundly emarginate, 1.9× wider than posterior margin, lateral margins convergent from basad of midpoint, posterior margin emarginate, surface lightly sclerotized on basal region, with setae in posterior half; in lateral view (Fig. 36b), dorsal outline sinuate. Sternum IX (spiculum gastrale, Fig. 36c) with basal plate bifurcate, forming two opposed triangles, nearly 1.9× longer than wide each; apodeme 0.4× width of aedeagus in lateral view, 1.5× length of aedeagus. Tegmen (Fig. 36d) with tegminal apodeme 0.5× length of aedeagus; basal piece connate with tegminal plate; tegminal plate with mesal n-shaped projection, posteriorly directed. Aedeagus in dorsal view (Fig. 36e) 3.4× longer than mesal width, lateral margins parallel; apex (Fig. 36f) widely rounded, mesally narrowed; in lateral view (Fig. 36g) dorsally convex, 4.3× longer than mesal width. Endophallus with pair of subapical sclerotized plates closing the ostium and two dark areas near midpoint. Aedeagal apodemes slightly longer than aedeagus.

Intraspecific variation. The length (pronotum plus elytra) ranges from 3.6 to 4.6 mm, the width from 1.9 to 2.5 mm. In males, the tubercles of the midfemur vary in size and location, some directly across from each other, some with the anterior tubercle closer to the apex, and some with the tubercles joined into a blunt crosswise ridge. The elytral color variations include all brown, brown with paler scales on interval 1 at apical third, and brown with a broken fascia of paler scales from humerus to apical third. The size and density of prothoracic scales varies. Inflexed margins of elytra in some specimens are completely denuded, apparently by movement of the hind femora.

Remarks and comparative notes. Males can be identified by the tubercles on the enlarged midfemur. Females of this species are similar only to females of *C. tibialis*. The lateral margins of the prothorax and the area surrounding the coxae are more deeply striate in *C. femoratus*. In *C. femoratus*, the apical margin of the foretibia is straight and the outer margin is moderately triangularly produced; in *C. tibialis*, the apical margin is curved and the outer margin is rounded with a ventral process.

Range. Known only from three localities in central South Carolina.

Materials examined. On hand for this study were 41 specimens, 13 males and 28 females.

Holotype female, allotype male (in CASC on long-term loan to CWOB), and 14 paratypes: "S[OUTH]C[AROLINA]: LexingtonCo., PeachtreeRockH[eritage]P[reserve], Edmund 9-III-08, N33°49.809', W81°11.847'/J.C.Ciegler, berlese, sifted, pine,oak.sw.gum".

Paratypes. S[OUTH] C[AROLINA]: Kershaw Co., Goodale State Pk, Camden 27-I-08, N34°17.112' W80°31.535' / J. C. Ciegler, berlese, sifted, ex lichens on sand (2); same except N34°16.974', W80°31.596' (5); same except N34°17.165', W80°31.521', 1-III-08, ex lichens, longleaf pine (1); same except N34°17.146', W80°31.515' (2); SC: Lexington Co., Peachtree Rock H[eritage] P[reserve], Edmund 5-II-08 N33°49.986', W81°11.630' / J. C. Ciegler, berlese ex lichens on sand (1); same except 8-III-08 N33°49.655', W81°11.870' (1) same except 9-III-08 N33°49.902', W81°11.870' / ex lichens, moss on sand (1); SC: Richland Co., Sandhills

Res&Ed, Center, Pontiac; 3/24/2005, Sweeping, Coll. J.C. Ciegler (1); SC: Richland Co., Pontiac, Sandhills, R&E Ctr. 12-I-08, N34°08.167', W80°52.494', J. C. Ciegler, berlese ex pine chips in mixed woods (1); same except N34°08.260', W80°52.217', ex lichens, longleaf pine (4); same except 15-I-08, N34°08.364', W80°52.188', 15-I-2008, ex lichens, longleaf pine straw (2); same except N34°08.367', W80°52.056' (1); same except N34°08.363', W80°52.078' (1); same except 9-III-08, N33°49.809', W81°11.847', lichens, moss (2). Paratypes are in the following collections: BMNH, CASC, CMNC, CUAC, CWOB, FSCA, JCCC, JFCC, SCSM, and USNM.

Etymology. This epithet is from the Latin adjective *femoratus* (= of the femur), and refers to the strangely formed middle femora and tibiae of the male.

***Cercopeus maspavancus* Sleeper, 1955**

(Fig. 8, 21, 44)

Diagnosis. Body broad-oval, integument shining, reddish brown, prothorax and head darker in some specimens; clothed with tan, fuscous, and dark brown oval to round recumbent scales, imbricate or not on sides and apical region of elytra; and with dense suberect, coarse, bristle-like setae.

Description. Female. Length, pronotum and elytra: 3.3-4.5 mm. Width, elytra: 2.1-2.6 mm. **Rostrum** one-third longer than head, broad, nearly straight in basal two-thirds, slightly convex near base, apical third abruptly depressed; dorsomedian area slightly convex; basal half with round gray scales concealing punctures, apical half with minute scales and moderately sparse, elongate, suberect pale setae; nasal plate well defined, margins carinate. **Head** with frons with large, shallow, oval fovea generally covered with large round recumbent scales, vertex striate-punctate with few small scales, occiput nearly glabrous, nearly smooth, transversely strigulate; eyes nearly round, moderately convex. **Antennae** thick; scape curved, in repose not reaching pronotum, markedly widened to apex, apex as wide as widest part of foretibia, with minute dense scales and long sparse suberect setae; funicular antennomere 1 as wide as long, 2 about 1.3× as long as 1, 3-6 subequal and slightly wider than long and rounded, 7 slightly longer and wider than 6; club broad-oval, about as long as antennomeres 1 + 2. **Prothorax** 1.2× wider than long, nearly uniformly oval, very slightly constricted at apex, base and apex subequal in width; lateral margins moderately rounded in anterior view; middle of pronotum distinctly tumid; disc on median 3/4 with small substriolate punctures separated by own width, with dark brown recumbent scales, and moderately short coarse, curved setae, lateral margin with few paler scales or minute dark brown scales, inflexed area of pleuron with plumose pale scales. **Elytra** elongate-oval, 0.75× as wide as long, broadest at middle, sides roundly evenly narrowed to apex, apices narrowly conjointly rounded; densely covered with imbricate dark brown scales, with an oblique fascia of larger paler scales from humerus to declivity, followed by black fascia and pale scales behind, or with scales nearly uniform in size and color; striae fine with small to medium-sized round punctures; intervals equal in width, nearly flat, each with single row of closely spaced long oblique setae. **Legs** stout, forefemur widest with small, not contiguous, recumbent scales and subrecumbent fine elongate setae; foretibiae denticulate or not internally, produced at apex as broad equilateral triangle with nine pale spines on distal edge and internally with elongate acute mucro; hind tibia with two blunt stout apical spines, and outer margin of apex with row of about 11 long pale spines. **Venter** with sparse moderately large punctures, sparse recumbent plumose scales, metasternum and lateral margins of abdominal sternum I with elongate recumbent nonplumose scales, abdominal sterna with dense long fine subrecumbent setae; abdominal sterna moderately shiny, nearly flat; abdominal sternum I 1.5× longer than II; sterna III + IV equal, together slightly longer than II; sternum V slightly longer than II, wider than long, apex rounded. **Genitalia:** Tergum VII (Fig. 44a) subquadrate, 1.1× wider than long, with anterior margin rounded, 1.5× wider than posterior margin, lateral and posterior margins straight, surface with setae on apical third. Tergum VIII (Fig. 44b) 1.2× longer than wide, with anterior margin emarginate, lateral and posterior margins straight, with setae on apical fourth. Sternum VIII (Fig. 44c) 0.7× length of sterna I-V together, spoon-shaped, with lamina 2.2× longer than wide, rounded at corners, with apicolateral area and median basolongitudinal region more sclerotized than basilateral regions, with three lateral posterior submarginal setae. Coxites + styli (Fig. 44d)

0.9× length of base of sternum VIII; coxites with several pre-apical mid-sized setae; styli apically inserted, 2.4× longer than basal width, with 3-5 long apical setae. Genital chamber 0.6× length of sternum VIII. Spermatheca (Fig. 44e) 1.3× longer than wide, j-shaped; cornu nearly straight; ramus narrower and shorter than collum, both apically truncate, laterally rounded, diverging; surface of corpus, collum, and ramus reticulate.

Male. Unknown.

Range. MA, NC, PA, SC, VA (O'Brien and Wibmer 1982).

Materials examined. On hand from South Carolina were 4 females: Darlington Co., Pee Dee R & E Center, 15-II-2008, N34°17.848', W79°44.099'/J.C.Ciegler, berlese, sifted, oak, holly, on sand (1) (CWOB); Georgetown Co., Sandy Island, 3/28-4/29/00, In Pit Trap (1) (JCCC); Kershaw Co., Goodale St Park, Camden 20-I-2007, N34°16.963', W80°31.516'/J.C. Ciegler, berlese, sifted, in wood chips (1) (JCCC); same except in leaf litter (1) (CWOB).

***Cercopeus paulus* O'Brien, Ciegler and Girón, new species**

(Fig. 9, 10, 31, 37, 45)

Diagnosis. Body short-oval to elongate-oval; integument shining, black to dark reddish brown; clothed with black, brown, and few whitish tan to white, oval to round, subcontiguous to imbricate, recumbent scales; basal 1/3 of elytral disc brown surrounded with maculae and fasciae of imbricate pale and black scales; and with moderately dense, coarse, bristle-like, erect setae.

Description. Holotype female. Length, pronotum and elytron: 2.6 mm. Width, elytra: 1.35 mm. **Rostrum** nearly straight, weakly raised at antennal insertion in lateral view, apical 1/3 weakly depressed; dorsomedian area not impressed; basal 2/3 densely clothed with coarse recumbent large scales concealing punctures; apical 1/3 subglabrous with moderately coarse, subcribrate punctures and moderately sparse, elongate, golden brown, suberect setae; with nasal plate moderately well-defined, not carinate or punctate. **Head** with frons with large, deep, median fovea; densely clothed with scales at base of rostrum concealing punctures; punctures behind frons substriate, elongate-oval, each filled with recumbent scale or strap-like seta; eyes round-oval, moderately strongly convex. **Antennae** moderately stout; scape short, in repose not reaching pronotum, moderately clavate, with dense elongate recumbent scales and moderately dense long coarse suberect setae; funicular antennomere 1 about 0.50× longer than 2 and 0.50× wider, 3-5 slender, subequal in length, 6 and 7 broad and rounded, subequal in length, 1/2 as long as 2; club short, broad-oval, slightly longer than funicular antennomeres 1 + 2 (Fig. 31). **Prothorax** not transverse, 0.98× as wide as long, sides strongly expanded from distinct subapical constriction to widest at middle, there with sides rounded and narrowed to truncate base, base with narrow collar; disc on median 2/3 with large contiguous to separate punctures, with brown recumbent scales nearly concealing integument, laterally with denser round recumbent white scales concealing integument; lateral margins of disc broadly rounded in lateral or anterior view; sides rugosely, granularly coarsely punctate with sparse, grayish to brown, round to oval, recumbent scales nearly concealing integument; disc with moderately dense, long, coarse, suberect setae. **Elytra** short broad-oval, broadest at middle behind rounded humeri, then sides roundly evenly narrowed to rounded apex; 0.77× as wide as long; median area of disc maculate with white, gray brown, and dark brown scales, bordered by pale tan to whitish uneven narrow fascia of scales, latter bordered unevenly with brown fascia; declivity, lateral areas, and inflexed lateral area densely clothed with recumbent, dense, white to tan scales; striae punctures deep, elongate and nearly concealed by dense scales, separated by own diameter; intervals uneven in width, flat, each with even row of coarse bristle-like, erect setae, and dense, round to oval, contiguous to imbricate recumbent scales. **Legs** moderately stout; femora moderately clavate; with dense, not contiguous, recumbent scales and suberect fine setae; foretibia externally apically roundly expanded, with nine noncontiguous spines and short acute mucro; nearly straight with slight sinuate inner curvature; inner margin not denticulate; hind tibia with two acute moderately stout anterior apical black spines, and outer margin with 12 short to moderately long coarse sharp pale spines becoming longer posteriorly. **Venter** with dense non-

contiguous recumbent plumose scales on pro-, meso-, and metasternum; abdominal sterna with moderately sparse recumbent setae, sterna I and II laterally with few elongate-oval shining recumbent scales; entire venter with sparse, fine, punctures; abdominal sternum I broadly weakly convex, 1.06× as long as II; II transversely flattened, and 1.42× as long as subequal weakly convex III + IV together; V about 0.82× as long as II and basal 2/3 nearly flat with apical 1/3 depressed; sterna I, II, and V coarsely punctate, with apical 1/3 of V less densely punctate; III + IV with line of basal punctures. **Genitalia:** Tergum VII (Fig. 45a) 1.3× wider than long, with anterior margin rounded, 1.6× wider than posterior margin, lateral margins nearly straight, posterior margin emarginate, surface with short setae in posterior third; in lateral view, dorsal outline straight. Tergum VIII (Fig. 45b) with anterior margin slightly emarginate; lateral margins nearly straight, convergent on apical third; anterior margin 2.3× wider than posterior margin; posterior margin emarginate, with setae on marginal area. Sternum VIII (Fig. 45c) 0.7× length of sterna I-V together, with lamina semihexagonal, 2.3× longer than wide, rounded at apex, with apicolateral area and median basolongitudinal region more sclerotized than basilateral regions, with 2-3 lateral submarginal setae. Coxites + styli (Fig. 45d) 0.7× length of lamina of sternum VIII; apex of coxites with two robust setae and few shorter setae; styli dorsoapically inserted, 2.7× longer than basal width, dorsally narrowed apicad of midpoint to apex, with two robust setae. Genital chamber 0.7× length of sternum VIII. Spermatheca (Fig. 45e) 1.2× longer than wide, j-shaped; cornu straight, with an apical projection directed to collum; ramus abruptly projected, apically truncate, laterally rounded; collum apically truncate, laterally widely rounded; surface reticulate.

Allotype male. Same as female holotype except: Length, pronotum and elytron: 2.55 mm. Width, elytra: 1.25 mm. **Prothorax** about as wide as long, basal margin without collar. **Elytra** elongate-oval, broadest behind rounded humeri at basal 1/5, then sides subparallel to just anterior to declivity, and evenly narrowed to rounded apex; 0.85× as wide as long. **Legs** with foretibia not expanded externally, with weak denticles on inner margin, and with long strongly curved acute mucro; hind tibiae with one stout anterior apical spine and outer margin with three short blunt pale spines, and cluster of seven posterior long, moderately coarse, sharp pale spines. **Venter** with abdominal sterna I and II broadly weakly convex; abdominal sterna I-IV with basal row or narrow band of recumbent scales. **Genitalia:** Tergum VIII (Fig. 37a) slightly wider than long, with anterior margin nearly straight, 1.6× wider than posterior margin, lateral margins convergent on apical half, posterior margin slightly rounded, with setae in posterior third; in lateral view (Fig. 37b), dorsal outline sinuate. Sternum VIII forming an entire plate, very lightly sclerotized, slightly narrower than posterior margin of tergum VIII, with apodeme (spiculum relictum) nearly 2× longer than wide, distally darkened. Sternum IX (spiculum gastrale, Fig. 37c) with basal plate bifurcate, forming two opposed triangles, each nearly 3× longer than wide; apodeme nearly 0.2× width of aedeagus in lateral view, as long as 1.4× length of aedeagus. Tegmen (Fig. 37d) with tegminal apodeme 0.7× length of aedeagus; basal piece connate with tegminal plate; tegminal plate mesally, roundly, posteriorly projected. Aedeagus in dorsal view (Fig. 37e) 3.5× longer than mesal width, lateral margins subparallel, slightly emarginate at mesal region; apex (Fig. 37f) widely rounded; in lateral view (Fig. 37g) dorsally strongly convex, 5× longer than greatest width. Endophallus with two convergent antepical sclerites closing the ostium and several rows of small teeth. Aedeagal apodemes 1.4× longer than aedeagus.

Intraspecific variation. The length (pronotum plus elytra) ranges from 2.45 to 3.50 mm, the width from 1.15 to 1.80 mm. Some specimens have a large distinct basal dark brown area surrounded by a typical black and pale fascia; the inflexed areas next to the hind femur in some specimens have sparse widely separated recumbent scales.

Remarks and comparative notes. This species is similar to several small species in the North and West, but is by far the smallest in the Southeast. Its size alone will distinguish it from other southeastern species. Females of this species are similar to small individuals of *C. chrysorrhoeus*, but lack the subapical spine on the foretibia; they resemble *C. alexi* and *C. skelleyi*, but lack the basal process of the pronotum.

Range. Known only from the type locality in central South Carolina.

Materials examined. On hand for this study were 15 specimens, 8 males and 7 females.

Holotype female, allotype male (both in CASC on long-term loan to CWOB), and 1 paratype: "S[OUTH] C[AROLINA] Richland Co., Ballentine, N34° 08.119', W81° 13.663', 25-X-2006/J. C. Ciegler, berlese, sifted, mixed woods".

Paratypes. S[OUTH] C[AROLINA] Richland Co., Ballentine, 5-XI-2006, N34°08.116', W81°13.685'/J. C. Ciegler, berlese, sifted, mixed woods (4); same except N34°08.115', W81°13.635' (4); same except 6-I-2007, N34°08.114', W81°13.659', (2); same except 12-II-08, N34°08.127', W81°13.674'/ nr. rotted stump (1); same except N34°08.130', W81°13.676', 2-II-08 (1). Paratypes are in the following collections: CASC, CUAC, CWOB, JCCC, SCSM, and USNM.

Etymology. This specific epithet is from the Latin noun, *paulus* (=little, small) and refers to the size of this small species.

***Cercopeus skellei* O'Brien, Ciegler and Girón, new species**

(Fig. 11, 12, 32, 38, 46)

Diagnosis. Body elongate-oval to broad-oval; integument shining, dark reddish brown to black; clothed with black, brown, and few whitish tan to white, oval to elongate-oval, recumbent scales; some with scales predominantly grayish white with large basal black and brown elytral macula; and with moderately dense, distinct, suberect, moderately coarse setae.

Description. Holotype female. Length, pronotum and elytron: 4.00 mm. Width, elytra: 2.25 mm. **Rostrum** weakly curved, dorsal line scarcely curved in lateral view, apical 1/3 weakly depressed; dorsomedian area narrowly impressed from base to apical 1/3; basal 2/3 densely clothed with scales concealing large punctures; small shining granules evident among scales; apical 1/3 subglabrous with moderately coarse, substriate punctures and moderately sparse, elongate golden brown and white, suberect setae; with nasal plate sharply defined, not carinate or punctate. **Head** with frons strongly transversely impressed, with shallow median fovea; densely clothed with large elongate white scales, nearly concealing substriate punctures; punctures behind frons substriate, smaller, with smaller sparse scales; eyes round-oval, moderately strongly convex. **Antennae** moderately stout; scape moderately clavate, with moderately dense elongate recumbent scales and moderately dense long coarse suberect setae; funicular antennomere 1 about 0.17× longer than 2 and 0.50× wider, 3-7 subequal in length, 1/2 as long as 2, each gradually wider toward club; club short, broad-oval, 2× as long as and 2× as wide as funicular antennomere 1 (Fig. 32). **Prothorax** as wide as long, sides moderately evenly rounded from moderate subapical constriction to widest at middle, there roundly narrowed to truncate base; disc on median 3/4 with large and small contiguous deep substriolate punctures, with brown recumbent scales not concealing punctures, laterally with denser round recumbent white scales nearly concealing all punctures, except few seta-bearing punctures; disc becoming strongly curved laterally; base with median short triangular process; lateral margins of disc rounded in anterior view; sides rugosely, granularly coarsely punctate with sparse, grayish, round to oval, recumbent scales; disc with moderately dense, long, coarse, suberect setae. **Elytra** short broad-oval, 0.77× as wide as long, broadest at middle behind rounded humeri, sides then roundly evenly narrowed to rounded apex; median area of disc dark brown to black, bordered by pale tan to whitish uneven narrow fascia of scales, latter bordered with wider black band, declivity and lateral areas densely clothed with recumbent imbricate white to tan scales; inflexed lateral area with scarcely sparser, separate, smaller, round, recumbent scales; striae punctures deep, elongate and distinct, separated by own diameter; intervals uneven in width, flat, each with one uneven row of moderately fine, suberect setae, and dense, round to oval, imbricate recumbent scales. **Legs** stout; femora strongly clavate; with dense, recumbent scales and suberect, fine setae; foretibia apically externally and internally roundly expanded, with nine spines and stout short acute mucro; nearly straight with moderate sinuate inner curvature; inner margin not denticulate; hind tibia with two blunt stout anterior apical spines, and outer margin with 15 moderately long coarse sharp pale spines becoming longer posteriorly. **Venter** with dense to sparse noncontiguous recumbent plumose scales on pro-, meso-, and metasternum, and sternum I, especially laterally, and on articulating surface of forecoxa; sparse, narrow, strap-like, recumbent scales scattered unevenly on pro-, meso-, and metasternum and basal area of sternum I; abdominal sterna all

with moderately dense, fine, decumbent setae; entire venter with sparse, fine, punctures; abdominal sternum I transversely impressed between hind coxae, 1.33× as long as II; II weakly convex, and 1.50× as long as subequal III + IV; V about 0.83× as long as II and weakly longitudinally concave laterally in apical third. **Genitalia:** Tergum VII (Fig. 46a) slightly wider than long, with anterior margin rounded, 1.7× wider than posterior margin, lateral margins nearly straight, posterior margin straight, surface with setae on apical half; in lateral view, dorsal outline straight. Tergum VIII (Fig. 46b) with anterior margin slightly emarginate; lateral margins nearly straight, convergent on apical third; anterior margin 2.5× wider than posterior margin; posterior margin rounded, with setae on marginal area. Sternum VIII (Fig. 46c) 0.7× length of sterna I-V together, spear-shaped, with lamina 2.2× longer than wide, rounded at apex, with apicolateral area and median basolongitudinal region more sclerotized than basilateral region, with three lateral submarginal setae. Coxites + styli (Fig. 46d) 0.9× length of lamina of sternum VIII; apex of coxites with two short antepical and two slightly longer apical setae; styli apically inserted, 2.5× longer than basal width, apically rounded, with three long, one short apical, and one short antepical setae. Genital chamber 0.7× length of sternum VIII. Spermatheca (Fig. 46e) 1.2× longer than wide, j-shaped; cornu straight; ramus abruptly projected, apically truncate, laterally rounded; collum apically rounded; surface reticulate

Allotype male. Same as female holotype except: Length, pronotum and elytron: 4.00mm. Width, elytra: 2.10 mm. **Prothorax** with disc on median 2/3 with large and small contiguous deep punctures, becoming substriolate at median 1/3, with brown recumbent scales not concealing punctures, laterally with denser round recumbent white scales nearly concealing all punctures. **Elytra** elongate-oval, broadest behind rounded humeri at basal 1/5, then sides subparallel to just anterior to declivity, and evenly narrowed to rounded apex. **Legs** with foretibia more slender and more sinuate, strongly curved at apical 1/3, not produced externally, inner margin of apical half granulate-denticulate; hind tibiae with one stout anterior apical spine and outer margin with three short blunt pale spines, and cluster of seven posterior long moderately coarse sharp pale spines. **Venter** with abdominal sternum I broadly very deeply impressed, impression continuing shallowly on flattened sternum II; sternum V basally weakly convex, with narrow shallow transverse subapical impression. **Genitalia:** Tergum VIII (Fig. 38a) slightly wider than long, with anterior margin rounded, 2× wider than posterior margin, lateral margins convergent on apical half, posterior margin slightly rounded, surface lightly sclerotized on basal and basimesal regions, with setae in posterior third; in lateral view (Fig. 38b), dorsal outline sinuate. Sternum VIII forming an entire plate, very lightly sclerotized, 0.6× width of posterior margin of tergum VIII, with apodeme (spiculum relictum) triangular, distally 1.4× wider than long, darkened. Sternum IX (spiculum gastrale, Fig. 38c) with basal plate bifurcate, forming two opposed rhombi, nearly 1.5× longer than wide each; apodeme nearly as wide as aedeagus in lateral view, 1.4× length of aedeagus. Tegmen (Fig. 38d) with tegminal apodeme slightly shorter than aedeagus; basal piece connate with tegminal plate; tegminal plate mesally slightly, triangularly, posteriorly projected. Aedeagus in dorsal view (Fig. 38e) 3.8× longer than mesal width, lateral margins subparallel, slightly emarginate at mesal region; apex (Fig. 38f) truncate; in lateral view (Fig. 38g) dorsally strongly convex, 6.4× longer than mesal width. Endophallus with pair of subapical sclerotized plates closing the ostium and basal, long n-shaped sclerite. Aedeagal apodemes 1.6× longer than aedeagus.

Intraspecific variation. The length (pronotum and elytra) ranges from 3.1 to 4.2 mm, the width from 1.5 to 2.1 mm. Specimens vary in the sculpture of the pronotum from markedly striolate on median 2/3 to exclusively punctate without striolae; they may or may not have a glabrous midline. Color pattern of elytra varies from that described to completely mottled with gray and white scales without distinct pattern; the fascia described may be uneven and maculate in some specimens.

Remarks and comparative notes. This species is rather distinctive, although because of the strongly striolate pronotum, females of this species are similar to those of the larger *C. strigicollis*, but the latter species has an antepical tooth on the foretibia, has round contiguous convex shiny scales, and lacks a median process on the base of the pronotum. Males somewhat resemble large specimens of *C. paulus* with their punctate pronotum, but their foretibia is slightly bent near the apex and the midfemur is tuberculate. Males of *C. femoratus*, which also have tuberculate middle femora, differ in having a markedly striate pronotum. Females closely resemble those of *C. alexi*, which has a strongly striolate pronotum

and *C. paulus* which lacks any basal process of the pronotum, but some individuals of *C. skelleyi* are similar.

Range. Known only from Aiken and Hampton counties in western South Carolina.

Materials examined. On hand for this study were 73 specimens, 32 males and 41 females.

Holotype female, allotype male (both in CASC on long-term loan to CWOB), and 16 paratypes: "S[outh]C[arolina], [Aiken Co.] 8.3 mi N Aiken, Hwy.1,5-III-2001 C.W. O'Brien/berlese scrub oak litter".

Paratypes. S[OUTH]C[AROLINA], Aiken Co., 1.3 mi, N jct.I-20 & US-1, 4-14-I-1987, P. Skelley (4); same except 5.3mi E, Montmorenci Post, Office on US-78, 7-10-III-1992, P. Skelley, pitfall (1); SOUTH CAROLINA: Aiken Co., 1.3 mi. N jct. I-20& US 1. 4-14-I-1989 P. Skelley pigdung & malt pitfall in sandhill scrub (4); S[outh]C[arolina], 5.7 mi SE Mont-, morenci P.Office, 5-III-2001,sifting oak-pine C.W. O'Brien (4); same except 8 mi N. Aiken, Hwy 1, 20-I-2002, O'Brien & Turnbow/ Under wood on ground (6); same except 4.9 mi, SW Montmorenci P.O., Hwy78 20-I-2002 O'Brien & Turnbow/ sifted & heated oak-pine litter (7); same except Montmorenci, 22-I-2008,N33°30.446', W81°33.042'/ J.C. Ciegler, berlese sifted, oak. lichens (1); same except N33°30.325', W81°32.670'/ piled up litter (3); same except N33°30.322', W81°32.688'/ under blackjack oak (4); same except US-1, 1.2 mi. n. of I-20, N33°40.925', W81°40.105'/ oak, lichens (1); SC: Aiken Co., Aiken State Park, 11-II-2007, N33°33.120', W81°29.846'/ J. C. Ciegler, berlese sifted, under logs (2); same except 15-V-2007 (3); same except N33°33.119', W81°29.840' 20-II-08/ hollow below log (12); same except N33°33.131', W81°29.856'/ by oak stump (5); same except N33°33.140', 81°29.852'/ woods by old log (1); SC: Hampton Co., Solomons Crossing ca. 15 mi. S. Hwy. 301, at Co. line, 9-I-2005 C.W. O'Brien & R.H. Turnbow/berlese sifted hardwood litter on roadside (2); same except Solomons Crossroads, 18-I-2008, N32°47.646', W81°19.285'/J.C.Ciegler, berlese sifted, decid. roadside (2). Paratypes are in the following collections: BMNH, CASC, CMNC, CUAC, CWOB, FSCA, JCCC, JFCC, SCSM, and USNM.

Etymology. This species is named in honor of our friend and colleague, Dr. Paul E. Skelley, who collected the first known series of this and many other species, and made them available to us for study.

Cercopeus strigicollis Sleeper, 1955

(Fig. 13, 47)

Diagnosis. Body broad-oval; integument reddish brown to brown, pronotum darker, head piceous; clothed with moderate to small, round to oval, recumbent scales; elytra with an oblique uneven fascia of pale scales from humeri to declivity, and with sparse, pale, oblique slender scales; pronotum striate.

Description. Female. Length, pronotum and elytra: 3.7-5.1 mm. Width, elytra: 2.0-2.6 mm. **Rostrum** about as long as head, thick, dorsal contour curved in lateral view, sides slightly wider at antennal insertion; dorsomedian area flat; basal 1/2 sparsely to completely clothed with small pale scales, some specimens with scales partially concealed by agglutinate coating, apical 1/2 with smaller scales; nasal plate poorly to moderately well defined. **Head** with frons with small, round, deep fovea; frons with moderate-sized scales; vertex striate, with or without oval scales; occiput nearly glabrous, with transverse strigulae; eyes large, oval, slightly convex in dorsal view. **Antennae** moderately thin, scape unevenly curved, scarcely widened at apex, with small pale scales and sparse long suberect setae; funicular antennomere 1 clavate, as long as 2, 2 more slender but clavate, 3 and 4 slightly elongate and half as long as 2, 5-7 slightly wider, club elongate-oval, about as long as antennomeres 4-7. **Prothorax** 1.13× wider than long, sides strongly evenly rounded, widest at middle, very weakly constricted near apex; lateral margins rounded in anterior view; disc striolate, scales small and elongate-oval at middle, with narrow to broad margin of larger pale scales; inflexed area of pleuron rugose with dense small plumose scales; suberect setae short and fine. **Elytra** short broad-oval, 0.73× as wide as long, broadest 1/6 from base behind rounded humeri, sides somewhat parallel to apical third, then rounded evenly to apex, apices conjointly rounded; uniformly reddish brown, disc with moderately dense noncontiguous dark brown round scales and oblique fascia of pale scales from humeri to declivity, apical area and sides with noncon-

tiguous medium-sized scales; striae wide and deep, striae 1-6 with large deep contiguous punctures, 7-10 with small punctures; intervals flat, on disc subequal in width, each with row of fine long setae. **Legs** stout, forefemur inflated, with large to small scales contiguous near femoral apices, and with long, thin, suberect setae; foretibia with flattened rounded apex, anteapical spine on external margin, with apical internal stout moderately long acute mucro, and dense row of six to eight long pale spines at outer angle, inner margin sinuate, not denticulate; middle and hind tibiae each with row of about 20 long pale spines on outer margin. **Venter** with small noncontiguous plumose scales; abdominal sterna moderately shiny with few medium-sized punctures, fine and dense sparse scales, and dense long fine recumbent setae; abdominal sternum I convex, nearly twice as long as II; II slightly convex and nearly as long as III + IV; III + IV subequal; V longer than II, flat with slight transverse groove. **Genitalia:** Tergum VII (Fig. 47a) 1.1× wider than long, anterior margin rounded, 1.7× wider than posterior margin; lateral and posterior margins straight. Tergum VIII (Fig. 47b) 1.4× wider than long, anterior and posterior margins emarginate, lateral margins straight; anterior margin 2.3× wider than posterior margin; with setae on marginal area. Sternum VIII (Fig. 47c) 0.6× length of sterna I-V together, shovel-shaped, with lamina 1.8× longer than wide, with apical half and median basolongitudinal region more sclerotized than basal half, with one lateral submarginal seta. Coxites + styli (Fig. 47d) 1.2× length of lamina of sternum VIII; apex of coxites with one apical seta; styli apicoventrally inserted, 2.5× longer than basal width, apically rounded. Genital chamber 0.7× length of sternum VIII. Spermatheca (Fig. 47e) 4.4× longer than wide, j-shaped; cornu rounded (c-shaped), parallel to collum; ramus apically truncate, laterally rounded; collum apically rounded; surface of corpus, collum, and ramus reticulate

Male. Unknown.

Remarks and comparative notes. This species differs from all congeners by the distinct anteapical foretibial spine present in only two other species. The unusual head and rostrum of *C. simius* readily separates these two species, and *C. chrysorrhoeus* is in general much smaller and lacks the uniformly striolate pronotum.

Range. AL, GA, NC, SC (O'Brien and Wibmer 1982).

Materials examined. FLORIDA (New state record): Jackson Co., Florida Caverns State Park, 12 April 1989, F. Deyrup (CWOB); SOUTH CAROLINA: Charleston Co. Charleston, Nov. 1974, A. Solomon (2) (CUAC); Clarendon Co., Woods Bay State Park, Sept. 27, 2008 (1) (CWOB); Dorchester Co., Summerville, 2007, dead with fossils (1) (JCCC); Florence Co, Clemson Oct. 17, 1957, Nov. 18 1957, Wall HH (2) (CUAC).

***Cercopeus tibialis* O'Brien, Ciegler and Girón, new species**

(Fig. 14, 15, 18, 23, 33, 39, 48)

Diagnosis. Body elongate broad-oval; integument shining, dark reddish brown to black; clothed with brownish black, brown, and few whitish tan to white, oval to elongate-oval, recumbent scales; in some specimens scales predominantly grayish white with black and brown maculae; and with moderately dense, distinct, suberect, moderately coarse setae.

Description. Holotype female. Length, pronotum and elytron: 3.9mm. Width, elytra: 2.2 mm. **Rostrum** weakly curved, dorsal line nearly flat in basal 2/3 in lateral view; median area medially distinctly impressed from base to apical 1/3, basal 2/3 moderately sparsely clothed with scales, not concealing large shining punctures, apical 1/3 subglabrous with coarse substriate rugose punctures and moderately dense elongate white suberect setae; with nasal plate sharply defined, not carinate or punctate. **Head** with frons with large, median, round, shallow fovea, sparsely clothed with small white scales, not concealing large rugosely striate punctures; punctures behind frons striate, smaller, with smaller sparse scales; eyes elongate-oval, moderately strongly convex. **Antennae** moderately stout; scape moderately clavate, with sparse elongate recumbent scales and moderately dense long coarse suberect setae; funicular antennomere 1 about 0.17× longer than 2 and 0.50× wider, 3-7 subequal in length, 1/2 as long as 2; club short, broad-

oval (Fig. 33). **Prothorax** not transverse, 0.99× as wide as long, sides strongly expanded from narrowly carinate collared base to widest at basal third, there narrowed to short gradually subtubulate apex; disc completely striate, with small punctures at bottom of deep striae, subglabrous medially, lateral margins in part with denser round recumbent grayish scales partially concealing striae; striae straight medially from apex to pointed basal carinate process, and becoming strongly curved laterally; lateral margins of disc forming rounded distinct margin; inflexed area of pleuron concave, coarsely striate, moderately rugose above coxa; sides rugosely, coarsely punctate with sparse, grayish, round to oval, recumbent scales; disc with moderately dense, long, coarse, suberect setae; scales not forming distinct pattern. **Elytra** broad-oval, broadest just behind rounded humeri, then sides narrowed gradually in almost straight line to declivity and evenly narrowed to rounded apex; median area of disc dark brown to black, with pale tan to whitish uneven narrow fascia of scales inside and including humeri and along side margins and declivity, followed by black fascia and another pale fascia; inflexed lateral area with sparser, separate, smaller, round, recumbent scales; glabrous surface shining; striae punctures deep, round and distinct, separated by less than own diameter; intervals uneven in width, flat, each with one or two uneven rows of moderately fine, suberect setae, and dense, round to oval, recumbent scales. **Legs** moderately stout; femora very strongly clavate; with sparse, recumbent scales and suberect fine setae; foretibia nearly straight with moderate internal sinuation, inner margin not denticulate externally, apically roundly expanded with six spines and with ventrally directed process on inner apical margin at insertion of tarsomere 1 (Fig. 23), flattened internally with two spines and short stout acute mucro; hind tibia with two blunt stout anterior apical spines, outer margin with almost 20 long moderately coarse sharp pale spines becoming much longer posteriorly. **Venter** with dense to sparse noncontiguous recumbent plumose scales on pro-, meso-, and metasternum and sternum I, especially laterally, and on articulating surface of forecoxa; sparse, narrow, strap-like, recumbent scales scattered unevenly on pro-, meso-, and metasternum and basal area of sternum I; abdominal sterna all with moderately dense, fine, decumbent setae; venter with dense to cribrate, coarse to fine punctures except abdominal sterna with variable sparser, finer punctures; abdominal sternum I transversely impressed between hind coxa, 1.33× as long as II; II convex, and 1.50× as long as subequal weakly convex III + IV; V about 0.83× as long as II and weakly transversely concave in apical third. **Genitalia:** Tergum VII (Fig. 48a) 1.3× wider than long, with anterior margin rounded, 1.9× wider than posterior margin, lateral margins nearly straight, posterior margin slightly emarginate, surface with setae along apical area; in lateral view, dorsal outline straight. Tergum VIII (Fig. 48b) with anterior margin slightly emarginate; lateral margins nearly straight, rounded on apical fourth; anterior margin 2× wider than posterior margin; posterior margin slightly emarginate, with setae on marginal area. Sternum VIII (Fig. 48c) 0.6× length of sterna I-V together, spear-shaped, with lamina 1.9× longer than wide, rounded at apex, with apicolateral area and median basolongitudinal region more sclerotized than basilateral regions, with three lateral submarginal setae. Coxites + styli (Fig. 48d) 0.8× length of lamina of sternum VIII; coxites with four mid-sized and two slightly longer anteapical setae; styli dorsoapically inserted, 2× longer than basal width, apically mesally narrowed, with 5-6 apical setae. Genital chamber 0.7× length of sternum VIII. Spermatheca (Fig. 48e) 1.4× longer than wide, j-shaped; cornu curved; ramus abruptly projected, mesally swollen, apically truncate; collum apically rounded; surface of corpus, collum, and ramus reticulate.

Allotype male. Same as female holotype except: Length, pronotum and elytron: 4.00mm. Width, elytra: 2.1 mm. **Legs** even stouter, with forefemur asymmetrically swollen, external swelling with subapical blunt tooth-like process, inner surface in basal 2/3 with dense very long fine setae; midfemur basally lateroventrally granulate and strongly punctate, with strong inner tooth and angular ventral deep transverse groove followed by second strong inner tooth, outer margin swollen subacutely at apical third; foretibia strongly curved in apical 1/2, markedly internally expanded from base to midpoint, with deep curved concavity from midpoint to apex, with large tooth on outer margin of concavity, apically externally subacutely weakly expanded, with six short blunt spines and very short acute mucro; midtibia strongly sinuately expanded in basal 1/3, with strong long teeth, one each on inner and outer margins, apically deeply grooved from teeth to apex; hind tibia with one stout anterior apical spine and outer margin with 12 short blunt pale spines, and cluster of seven posterior long moderately coarse sharp pale spines. **Venter** with abdominal sternum I broadly deeply impressed, impression continuing shallowly on flattened sternum II; sternum V basally weakly convex, with narrow shallow transverse subapical impression; all abdominal sterna with very long, dense, fine, decumbent setae. **Genitalia:** Tergum VIII

(Fig. 39a) slightly wider than long, with anterior margin rounded, 1.6× wider than posterior margin, lateral margins convergent in apical half, posterior margin nearly straight, surface lightly sclerotized on basal and basimesal regions, with setae in posterior half; in lateral view (Fig. 39b), dorsal outline sinuate. Sternum VIII forming an entire plate, very lightly sclerotized, 0.7× width of posterior margin of tergum VIII, with apodeme subrectangular, mesally constricted, darkened. Sternum IX (spiculum gastrale, Fig. 39c) with basal plate bifurcate, forming two opposed rhombi, each nearly 1.6× longer than wide; apodeme 0.6× width of aedeagus in lateral view, 1.4× length of aedeagus. Tegmen (Fig. 39d) with tegminal apodeme 0.8× length of aedeagus; basal piece connate with tegminal plate; tegminal plate with bar-like mesal projection, posteriorly directed. Aedeagus in dorsal view (Fig. 39e) 3.4× longer than mesal width, lateral margins subparallel; apex (Fig. 39f) rounded; in lateral view (Fig. 39g) dorsally convex, 4.7× longer than mesal width. Endophallus with pair of subapical sclerotized plates closing the ostium. Aedeagal apodemes slightly longer than aedeagus.

Intraspecific variation. The length (pronotum and elytra) ranges from 4.0 to 5.0 mm, the width from 2.0 to 2.9 mm. Color varies from the typical pattern, to discal dark brown followed by a black fascia from humerus to declivity with remaining lateral and apical areas pale, to uniform dark brown.

Remarks and comparative notes. This species is very close to *C. femoratus*, which has a similar, markedly striate pronotum; the pronota of *C. strigicollis* and *C. cornelli* display discrete punctures within the striolae. Males of *C. femoratus* have the foretibiae with outer margin straight, inner margin with a large triangular tooth, and the apex rounded; while *C. tibialis* has the foretibia curved on both margins, on the inner margin extremely bent with notches and tubercles and the apex straight. Females of this species have a ventral process on the apex of the foretibia, not present in *C. femoratus* and the elytra are lighter in color than the pronotum in *C. tibialis*.

Range. Known only from the type locality, Florence, SC.

Materials examined. On hand for this study were 31 specimens, 17 males and 14 females.

Holotype female (in CASC on long-term loan to CWOB), "SC, Darlington Co., Florence, National Cemetery, 8-I-2005, C. W. O'Brien & R. H. Turnbow, berlese sifted mixed hardwood & longleaf pine litter".

Paratypes. SC, Florence, Jan. 1938 (6); same except 14 Feb 1938 [no collector] (ALLOTYPE MALE (CUAC), and two paratypes); same except 14-II-1938 (3); 25 Jan 1938 (4), 29 Jan 1938 (3), 3 Mch 1938 (11), F. F. Bondy, Soil Shaker (all from Clemson University Arthropod Collection). Paratypes are in the following collections: CASC, CUAC, CWOB, JCCC, SCSM, and USNM.

Etymology. This epithet is from the Latin adjective *tibialis* (= of the tibia), and refers to the strangely formed fore- and midtibiae of the male.

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Literature Cited

- Alonso-Zarazaga, M. A., and C. H. C. Lyal 1999.** A world catalogue of families and genera of Curculionoidea (Insecta: Coleoptera) (Excepting Scolytidae and Platypodidae). Entomopraxis, S. C. P.; Barcelona, Spain. 325 p.
- Burke, H. R. 1963.** New species of Texas weevils, with notes on others (Coleoptera, Curculionidae). Southwestern Naturalist 8(3): 162-172.
- Ciegler, J. C. 2010.** Weevils of South Carolina (Coleoptera: Nemonychidae, Attelabidae, Brentidae, Ithyceridae, and Curculionidae). Biota of South Carolina. Vol. 6. Clemson University; Clemson, SC. 276 p.
- Howden, A.T. 1995.** Structures related to oviposition in Curculionoidea. Memoirs of the Entomological Society of Washington 14: 53–102.
- ICZN [International Commission on Zoological Nomenclature]. 1999.** International Code of Zoological Nomenclature. International Trust for Zoological Nomenclature; London. xxx + 306 p.
- Nichols, S. W. 1989.** The Torre-Bueno glossary of entomology, revised edition of a glossary of entomology by J. R. de la Torre-Bueno including supplement A by G. S. Tulloch. The New York Entomological Society; New York, New York. i-xvii, 840 p.
- O'Brien, C. W. 1977.** *Cercopeus komarecki*, new species from Florida and Georgia (Coleoptera: Curculionidae: Otiorynchinae). Florida Entomologist 60(4): 257-261.
- O'Brien, C. W., and G. J. Wibmer. 1982.** Annotated checklist of the weevils (Curculionidae sensu lato) of North America, Central America, and the West Indies (Coleoptera: Curculionoidea). Memoirs of the American Entomological Institute 34: 1-382.
- Say, T. 1831.** Descriptions of new species of Curculionites of North America, with observations on some of the species already known. School Press; New Harmony, IN. 30 p.
- Schoenherr, C. J. 1843.** Genera et species curculionidum, cum synonymia hujus familiae, Species novae aut hectanus minus cognitae, descriptionibus a Dom. Leonardo Gyllenhal, C. H. Boheman, et entomologae aliis illustratae. vol. 7, pt. 1. Roret; Paris. 479 p.
- Sleeper, E. L. 1955.** A review of the Trachyloeini [*sic*] of America north of Mexico (Coleoptera, Curculionidae). Ohio Journal of Science 55: 279-292.
- Thompson, R. T. 1992.** Observations on the morphology and classification of weevils (Coleoptera, Curculionoidea) with a key to major groups. Journal of Natural History 26: 835–891.
- Velázquez de Castro, A. J. 1997.** Estudio morfológico y taxonómico del género *Sitona* Germar, 1817. (Coleoptera, Curculionidae). Ph.D. thesis, Universidad Complutense de Madrid, Madrid, Spain, 495 p. Available at www.UCM.es/eprints/419 (accessed 05 May 2010).
- Wanat, M. 2007.** Alignment and homology of male terminalia in Curculionoidea and other Coleoptera. Invertebrate Systematics 21: 147–171.

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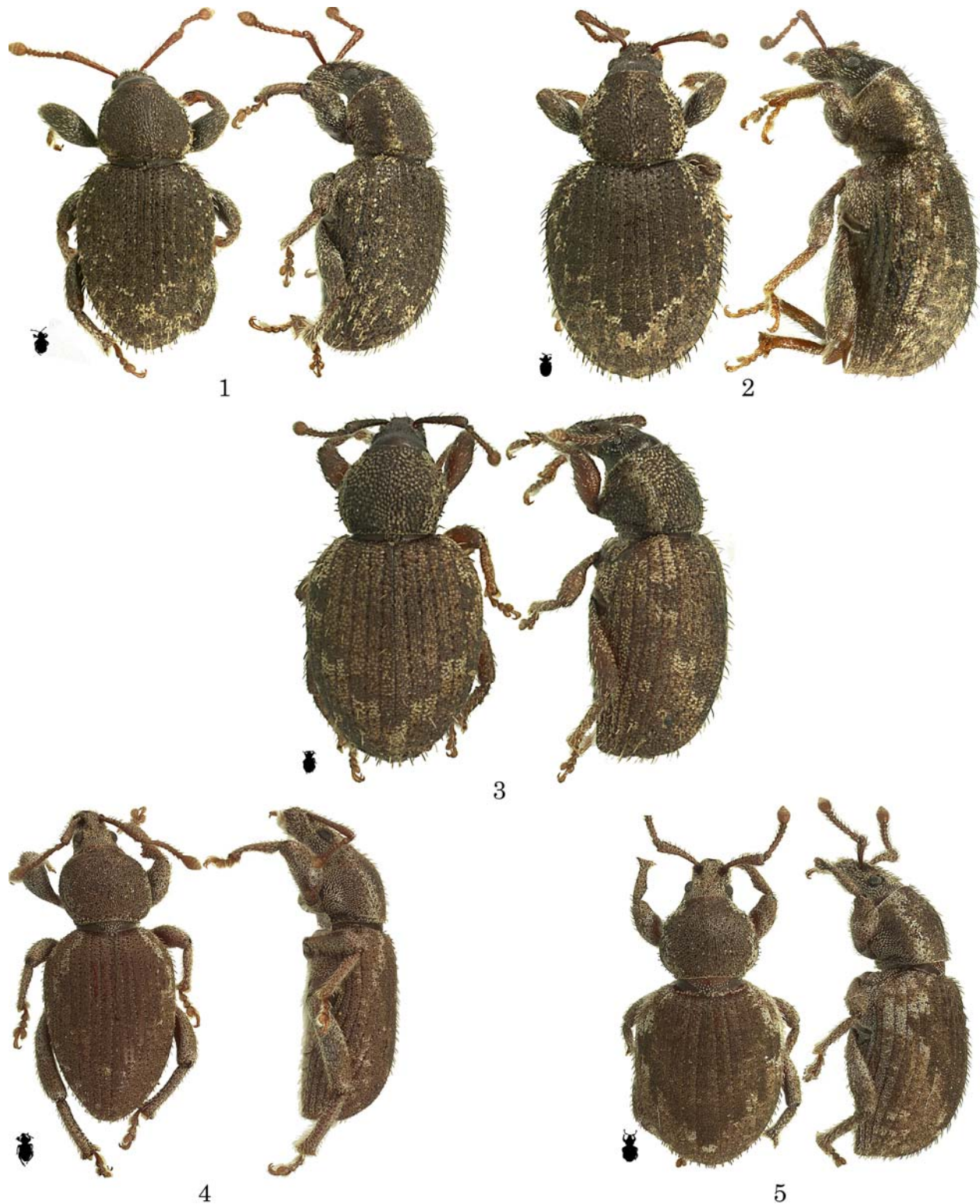


Figure 1-5. Habitus of *Cercopeus* species: dorsal view, lateral view, and life-size silhouette. 1) *C. alexi*, male. 2) Same, female. 3) *C. chrysorrhoeus*, female. 4) *C. cornelli*, male. 5) Same, female.

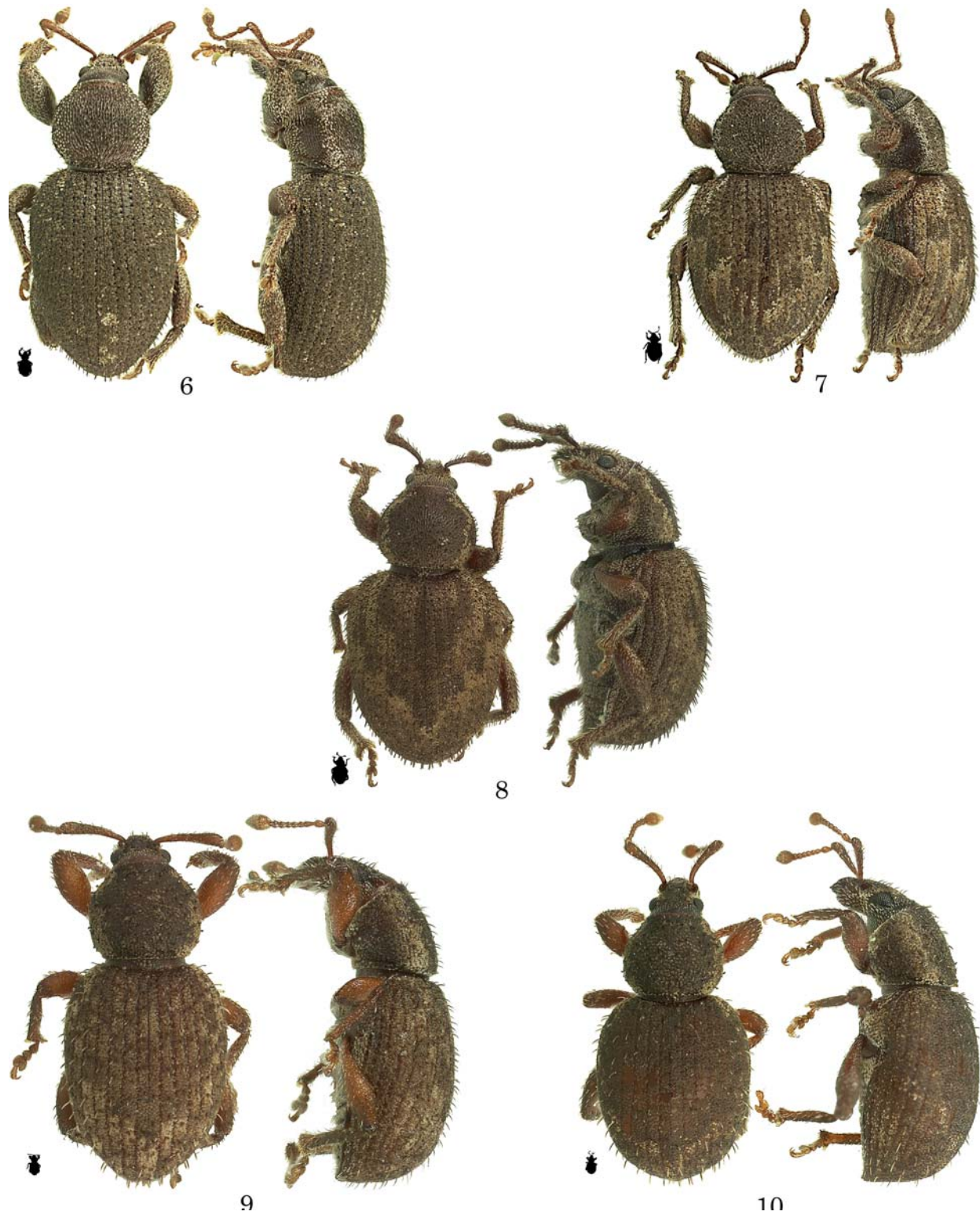


Figure 6-10. Habitus of *Cercopeus* species: dorsal view, lateral view, and life-size silhouette. **6)** *C. femoratus*, male. **7)** Same, female. **8)** *C. maspavancus*, female. **9)** *C. paulus*, male. **10)** Same, female.

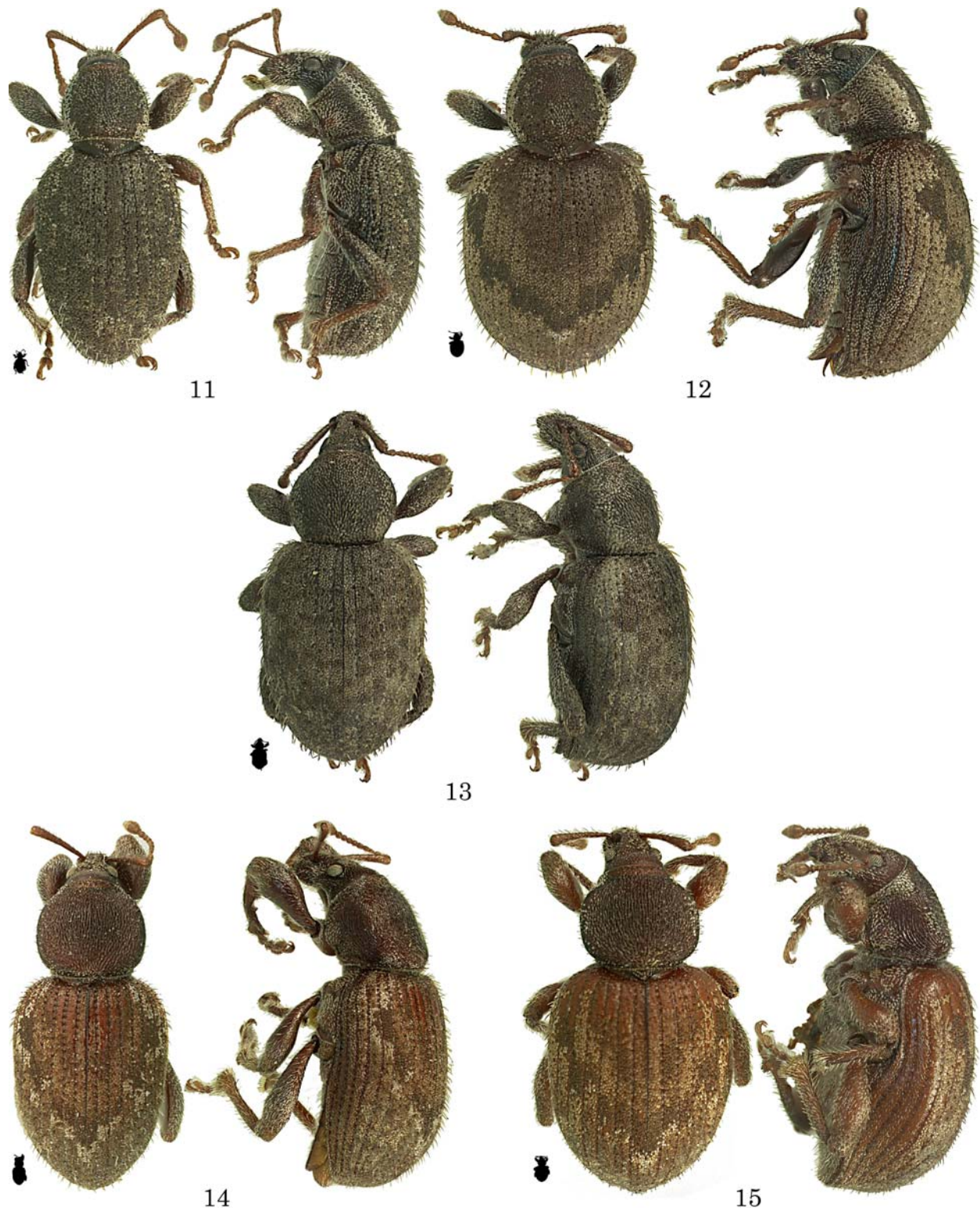


Figure 11-15. Habitus of *Cercopeus* species: dorsal view, lateral view, and life-size silhouette. 11) *C. skelleyi*, male. 12) Same, female. 13) *C. strigicollis*, female. 14) *C. tibialis*, male. 15) Same, female.

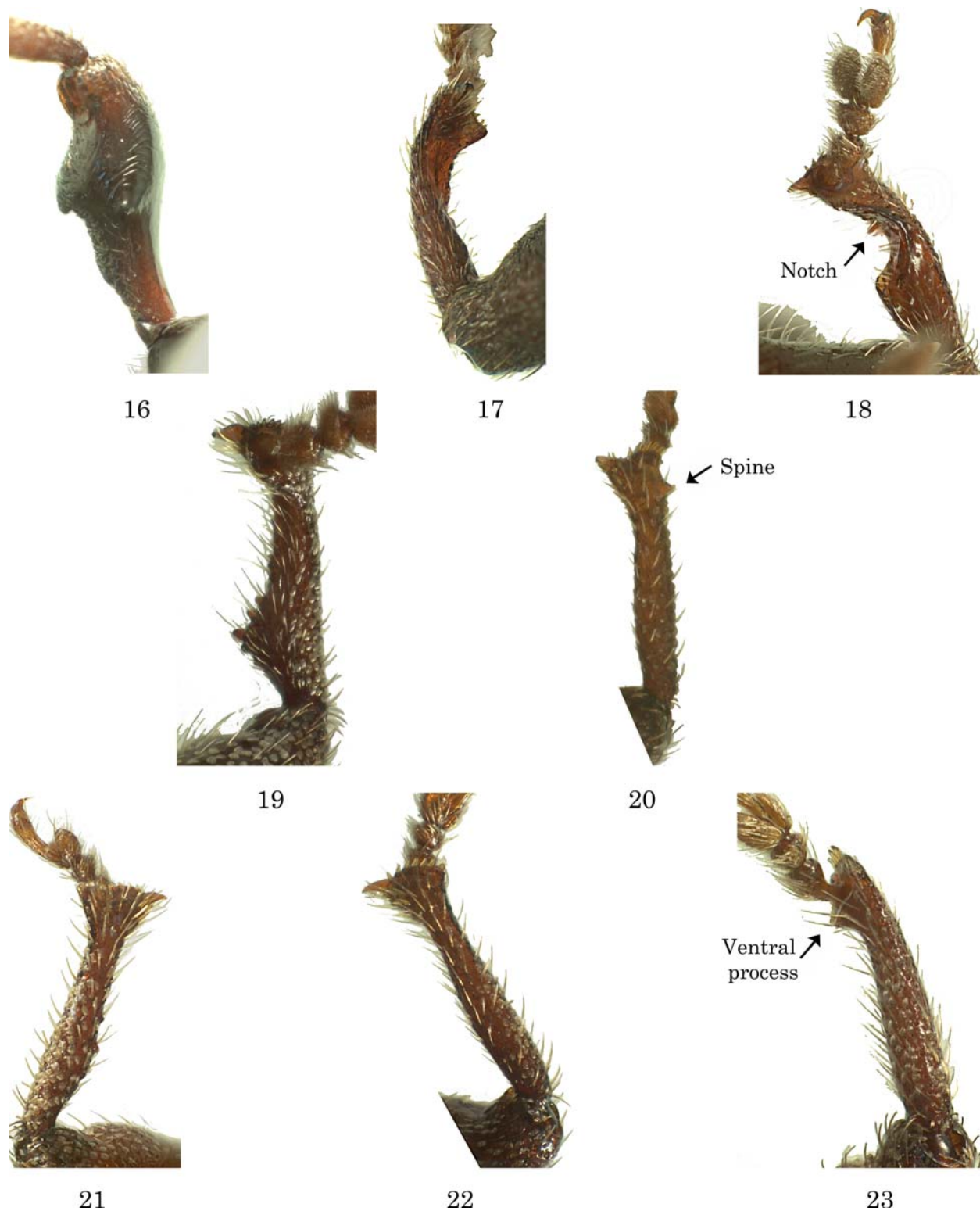


Figure 16-23. Legs of *Cercopeus* species. **16)** Left midfemur, *C. femoratus*, male, ventral view. **17)** Left foretibia, *C. alexi*, male, lateral view. **18)** Left foretibia, *C. tibialis*, male, lateral view. **19)** Right foretibia, *C. cornelli*, male, ventral view. **20)** Right foretibia, *C. chrysorrhoeus*, female, dorsal view. **21)** Left foretibia, *C. maspavancus*, female, dorsal view. **22)** Right foretibia, *C. femoratus*, female, dorsal view. **23)** Left foretibia, *C. tibialis*, female, lateral view.

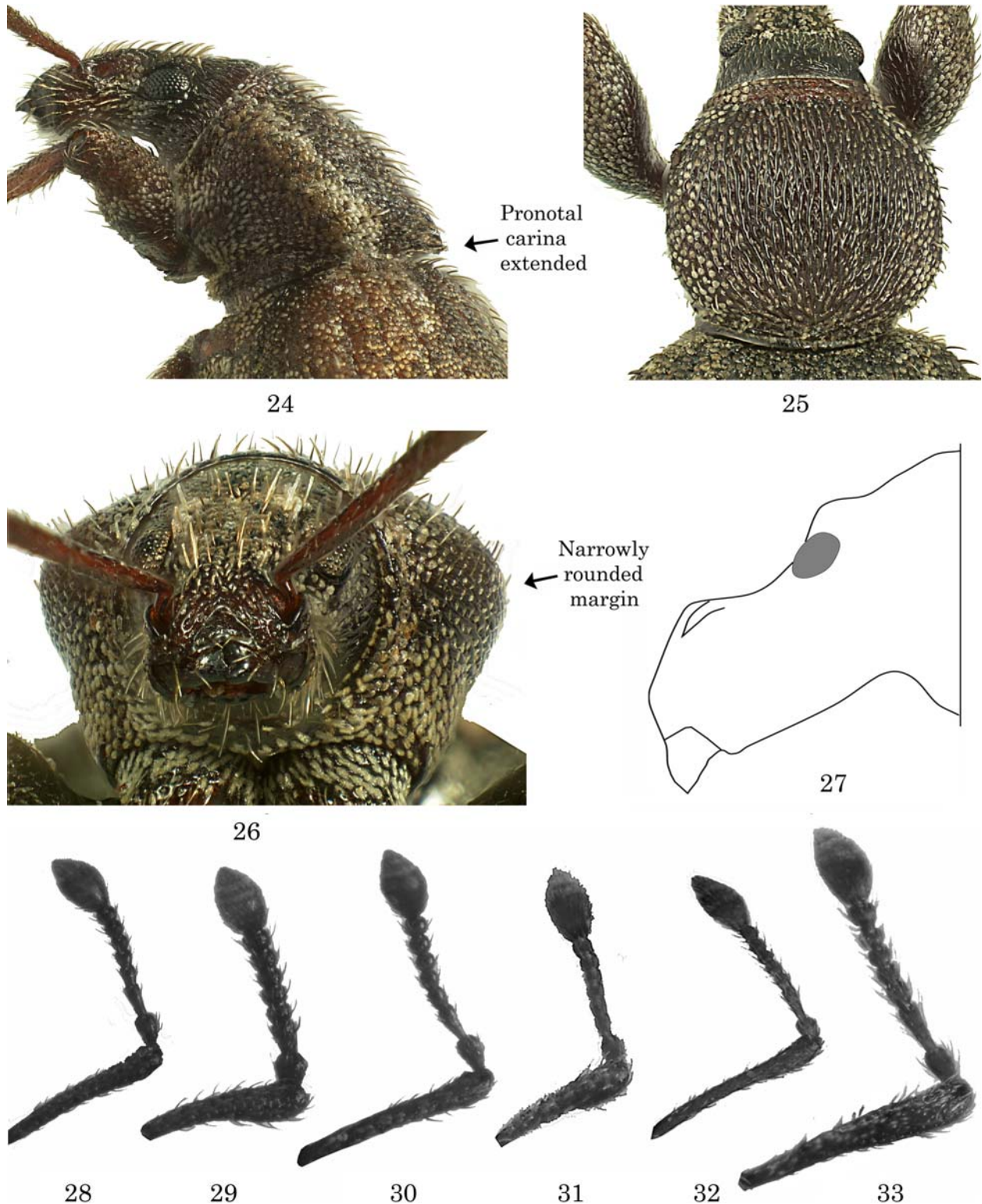


Figure 24-23. *Cercopeus* species. 24-27) Pronota. 24) *C. alexi*, female, left lateral view. 25) *C. femoratus*, dorsal view. 26) *C. femoratus*, frontal view. 27) *C. simius*, lateral view (from Sleeper 1955). 28-33) Right antennae. 28) *C. alexi*; 29) *C. cornelli*. 30) *C. femoratus*. 31) *C. paulus*. 32) *C. skelleyi*. 33) *C. tibialis*.

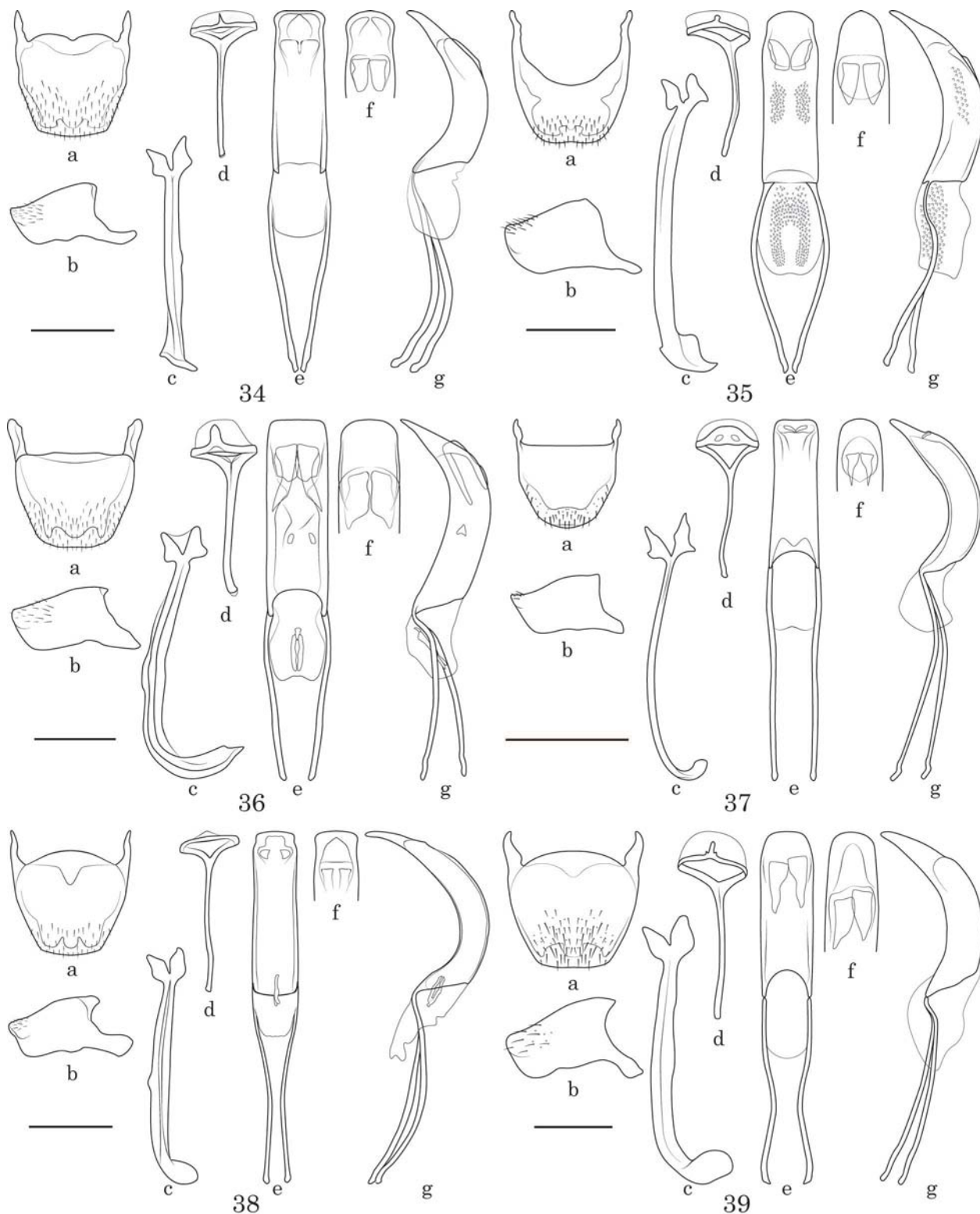


Figure 34-39. Male genitalia of *Cercopeus* species: **a.** tergum VIII, dorsal view; **b.** tergum VIII, lateral view; **c.** sternum IX (spiculum gastrale); **d.** tegmen; **e.** aedeagus, dorsal view; **f.** apex of aedeagus, dorsal view; **g.** aedeagus, lateral view. **34)** *C. alexi*. **35)** *C. cornelli*. **36)** *C. femoratus*. **37)** *C. paulus*. **38)** *C. skellei*. **39)** *C. tibialis*. Scale bar = 0.5 mm.

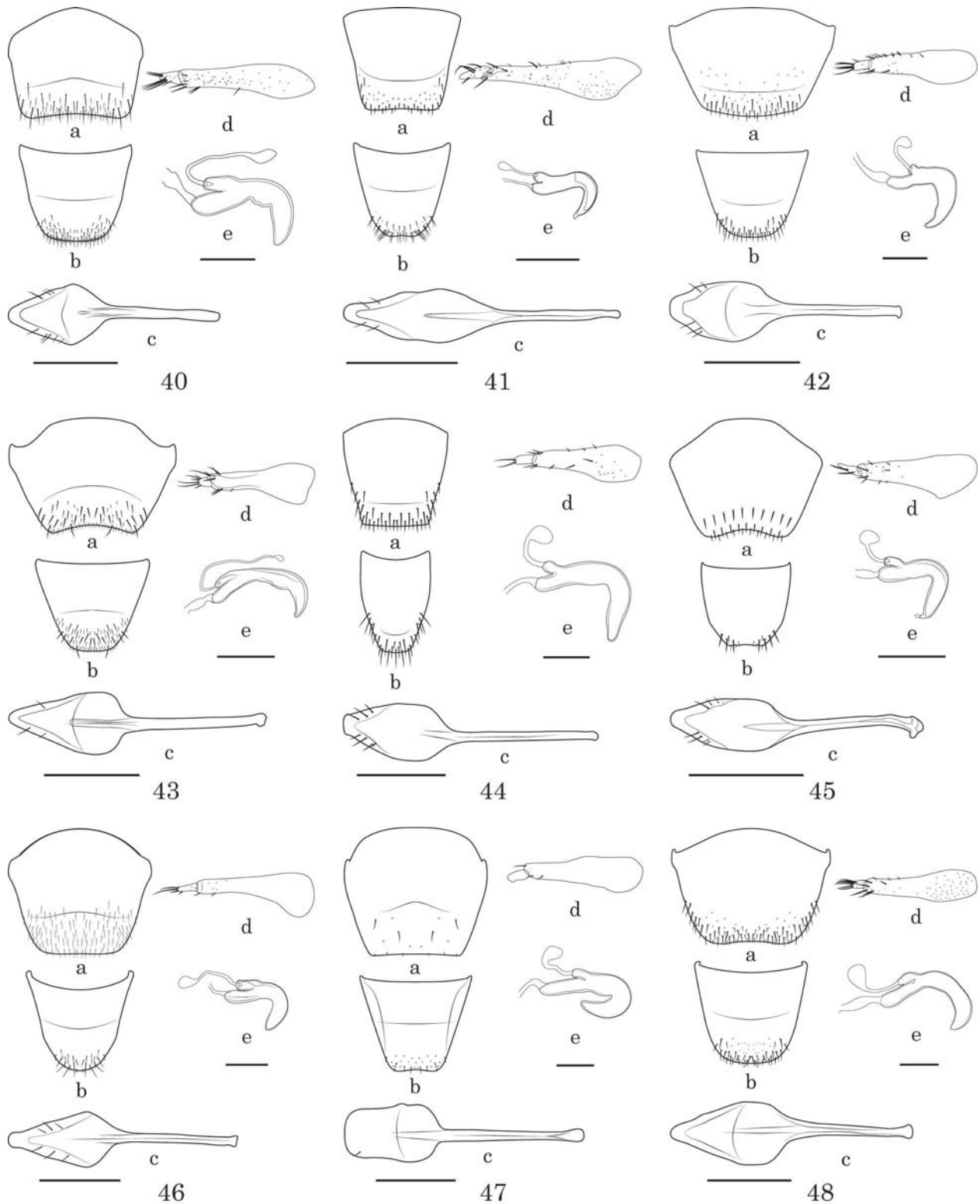


Figure 40-48. Female genitalia of *Cercopius* species: **a.** tergum VII, dorsal view; **b.** tergum VIII, dorsal view; **c.** sternum VIII, ventral view; **d.** coxite, lateral view; **e.** spermatheca. **40)** *C. alexi*. **41)** *C. chrysorrhoeus*. **42)** *C. cornelli*. **43)** *C. femoratus*. **44)** *C. maspavancus*. **45)** *C. paulus*. **46)** *C. skelleyi*. **47)** *C. strigicollis*. **48)** *C. tibialis*. Scale bars: 0.5 mm for a, b and c; 0.2 mm for d and e.

