

THE GENUS *BAKERELLA* IN NORTH AMERICA NORTH OF MEXICO (HOMOPTERA-FULGORIDAE-DELPHACINAE)

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The genus *Bakerella* was described by David L. Crawford (Proc. U.S.N.M., Vol. 46, p. 601, 1914) with *Bakerella maculata* Crawford as the genotype. Beamer described four new species from America North of Mexico (Jour. Kansas Ent. Soc., Oct. 1945) and another new species from the same region (Jour. Kansas Ent. Soc., Oct. 1946). Additional collecting has brought to light seven more new species from the same region which are described here, with a key to the twelve species now known from America north of Mexico.

Key to species of *Bakerella*

1. Anal segment of male without processes 2
- Anal segment of male with at least one process 3
2. Aedeagus in dorsoventral view with a large retrorse spine on each side near middle *bidens* Beamer
- Aedeagus in dorsoventral view without a large retrorse spine on each side near middle *muscotana* Beamer
3. Anal segment of male usually with one process absent or nearly so; elytra of brachypterous form reaching tip of abdomen 4
- Anal segment of male with a pair of processes; elytra of brachypterous form not reaching tip of abdomen 5
4. Aedeagus almost as long as length of pygofer, sides nearly parallel; elytra of brachypterous form with bullae at apices. *bullata* n. sp.
- Aedeagus many times wider at base than at apex; without bullae on apices of elytra *spinifera* n. sp.
5. Caudoventral margin of pygofer with a long slender dorsally projecting spine *pediforma* n. sp.
- Caudoventral margin of pygofer without a long, slender, dorsally projecting spine 6
6. Anal segment of male with processes long and extremely slender, about as long as width of pygofer *minuta* n. sp.
- Anal segment of male with processes normal 7
7. Anal segment of male with outer surface of processes curved ventrally 8
- Anal segment of male with outer surface of processes straight or excavated 9
8. Aedeagus bent ventrally at about a 45 degree angle on outer third *rotundifrons* Beamer
- Aedeagus bent ventrally at right angle on outer third *angulata* n. sp.
9. Male with a pair of black horns on connective between aedeagus and anal segment *cornigera* n. sp.
- Male without a pair of black horns on connective between aedeagus and anal segment 10

10. Aedeagus in lateral view narrowed on outer half of dorsal margin *fusca* Beamer
- Aedeagus in lateral view narrowed on outer third of ventral margin 11
11. Apex of aedeagus in lateral view slightly enlarged, five large retrorse teeth on outer third of dorsal margin *cinerea* Beamer
- Apex of aedeagus in lateral view not enlarged, apical third with many small retrorse teeth *penefusca* n. sp.

1. *Bakerella bullata* n. sp.

Brachypterous form:

Resembling *Bakerella muscotana* Beamer but all light marks crossing median carinae of clypeus united and elytra with two round bullae at apices. Length ♂ 1.6 mm.; ♀ 1.9 mm.

Structure: Clypeus slightly less than one-fifth longer than greatest width, widest on basal third, strongly narrowed toward each end, strongly tricarinate, median carina divided near union with crown; crown almost twice as long as basal width, carinae distinct; elytra widest near tip of scutellum, slightly longer than abdomen with two bullae on apex of each, veins raised with usual round black puncts scattered over them.

Color: General ground color brown to almost black; clypeus black with four pairs of united light spots crossing median carina, basal half of crown lighter; sometimes carinae of pronotum and scutellum lighter; membrane of elytra semihyaline to more or less infuscated, with a small yellow spot at anterior edge of each bulla.

Genitalia: In lateral view, pygofer of male almost rectangular, caudal margin slightly excavated; anal segment widest at apex, with a long slender, almost straight process on right side, the left one missing; aedeagus long, widest at base, sides almost parallel, curving gently ventrally to rounded apex, with numerous teeth on the ventral margin of anterior half and about four larger, retrorse teeth near middle of dorsal margin; styles widest at base, curving dorsally, sides narrowing to truncated apices. In caudoventral view, aedeagal brace broadly and deeply excavated; styles many times widest near base, strongly narrowed near middle to almost parallel-sided shafts with rounded apices.

Holotype ♂, allotype ♀, 13 ♂♂ and 9 ♀♀ paratypes, Yankeetown, Fla., March 9, 1947, R. H. Beamer; other paratypes: 13 ♂♂ and 12 ♀♀, Yankeetown, Fla., July 7, 1948, R. H. Beamer; 1 ♀, Cedar Keys, Fla., March 8, 1947, L. D. Beamer; 2 ♀♀, Cedar Keys, Fla., 1939, R. H. Beamer; 1 ♀, Slidell, La., June 25, 1948, R. H. Beamer; 9 ♂♂ and 7 ♀♀, Brownsville, Texas, at Boca Chica, December 27, 1945, R. H. Beamer; 4 ♀♀, 23 mi. east of Piney Point, Md., July 12, 1931, P. W. Oman.

Macropterous form:

Like the brachypterous form except with flight wings extending about half their length beyond the abdomen and generally darker in color. The elytra marked as follows: generally light with a broad diagonal black band crossing before middle and covering apical half of clavus, another in region of cross veins crosses the elytra and curves back to outer apical corner with

all apical veins broadly infuscated, giving the outer half of elytra a scalloped appearance.

Holomorphotype ♀ and 18 ♀ paramorphotypes, Slidell, La., June 25, 1948, R. H. Beamer; other paramorphotypes: 2 ♀♀, same place and time, E. L. Todd; 1 ♀, Mandeville, La., June 24, 1948, R. H. Beamer; 1 ♀, Yankeetown, Fla., July 7, 1948, R. H. Beamer.

Types in Snow Entomological Collections; paratypes in E. D. Ball collection, U.S.N.M.

2. *Bakerella spinifera* n. sp.

Brachypterous form:

Resembling *Bakerella bullata* n. sp. but without the bullate spots at the apices of the elytra. Length ♂ 1.5 mm.

Structure: Clypeus about twice as long as greatest width, widest near middle, margins sub-parallel, very slightly narrowed toward each end, definitely tricarinate, median carina divided near union with crown; crown slightly longer than basal width, carina distinct; elytra about twice as long as wide, extending to tip of genital capsule.

Color: General ground color brown to almost black; clypeus brown with semblance of three or more light median spots and about that many lateral spots; elytra with a black spot near tip of scutellum, black diagonal cross bar arising on tip of clavus, crossing wing parallel to scutellum and reaching costal margin, tip of wings from cross veins out also black except large hyaline spot near outer costal margin and two smaller areoles on the apical margin between the veins.

Genitalia: In lateral view, pygofer of male almost rectangular; anal segment small with one long, tapered process on the left side and a mere point on the right; aedeagus many times wider at the base than at apex, narrowed and curved ventrally to rounded apex, anterior outer third thickly covered with retrorse teeth, thickest near outer third of dorsal margin, dorsal margin with a rounded knob-like process near middle; styles widest near base, more or less pediform, apices sharp. In caudoventral view, aedeagal brace broadly rounded; styles widest on basal half, constricted on outer third, then sharply rounded to narrowed apices.

Holotype ♂ and 3 ♂ paratypes, Thomasville, Ga., June 30, 1948, R. H. Beamer. Types in the Snow Entomological Collections.

3. *Bakerella pediforma* n. sp.

Brachypterous form:

Resembling *Bakerella rotundifrons* Beamer but with the median carina of the clypeus divided almost at the apex. Length ♂ 1.8 mm.; ♀ 2 mm.

Structure: Clypeus about one-fifth longer than greatest width, widest near middle, narrowed toward each end, practically quadricarinate since the median carina divides almost at apex; crown about as long as basal width, widest at apex, carinae distinct; elytra about as broad as long, apices broadly rounded, veins raised with a few puncts on them; dorsum of abdomen with a few pustules on each side.

Color: General color stramineous or light brown; clypeus with color

between outer and inner carinae somewhat darker with four pairs of median light spots and three lateral pairs; elytra with a few dark spots surrounding the white lunate marks at apices; abdomen with a darker area on dorsum before genital capsule on each side.

Genitalia: In lateral view, pygofer of male more or less rectangular with a very long sharp, caudodorsally projecting spine on ventrocaudal corner; anal segment with a pair of very short, narrow, almost straight, processes; aedeagus widest at base, quite long, narrowed on dorsal margin near middle, outer half resembling a foot with the base on dorsal margin; aedeagal brace barely visible; styles widest at base, slightly spatulate at apices. In caudal view, aedeagal brace roundly excavated; styles widest near basal third, slightly narrowed just before pediform apices.

Holotype ♂, allotype ♀, 1 ♂ and 6 ♀ paratypes, Slidell, La., March 3, 1947, R. H. Beamer; other paratypes: 1 ♂ and 2 ♀♀, Ocean Springs, Miss., March 3, 1947, R. H. Beamer; 1 ♀, Pearlinton, Miss., March 3, 1947, R. H. Beamer; 1 ♂, Sanford, Fla., May 13, 1926, E. D. Ball.

Types and paratypes in Snow Entomological Collections; paratypes in E. D. Ball Collection, U.S.N.M.

4. *Bakerella minuta* n. sp.

Brachypterous form:

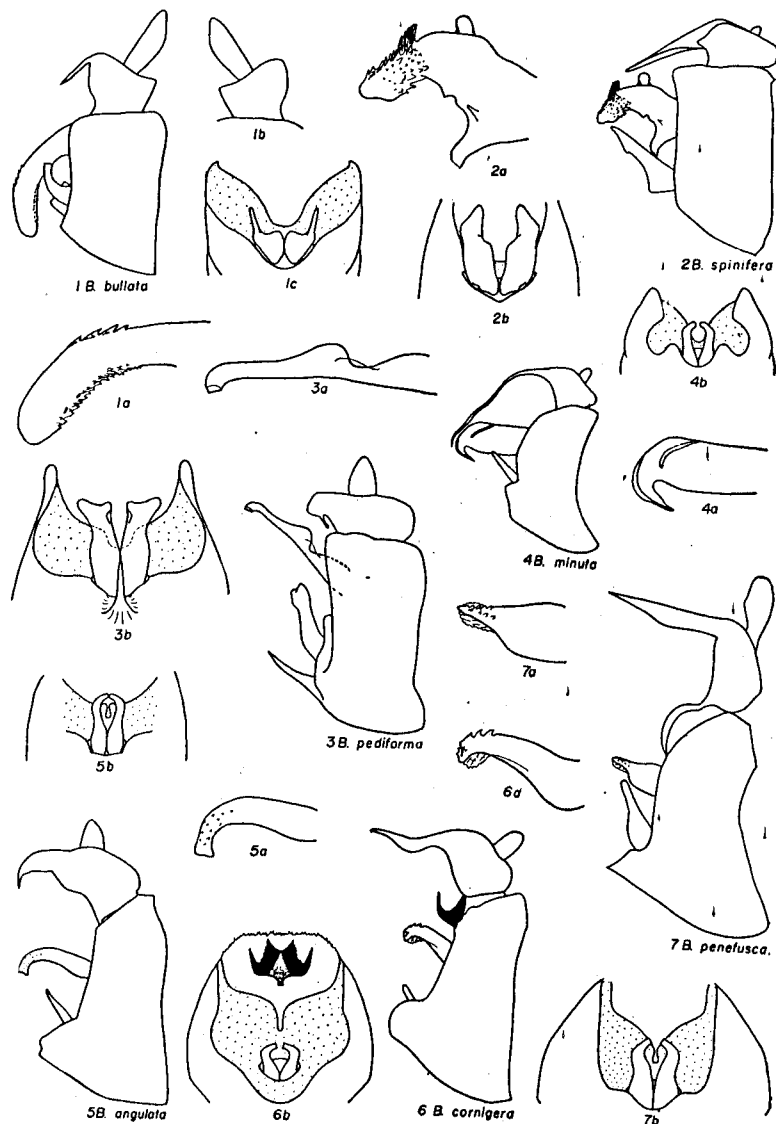
Resembling *Bakerella rotundifrons* Beamer but smaller, median frontal carina dividing near basal third instead of near middle with a pair of white spots at point of division, a second pair between these and base and usually two pairs near apex although apical pair is usually very small and sometimes wanting and male anal segment with a pair of very long, slender processes. Length ♂, 1.2 mm.; ♀, 1.6 mm.

Structure: Front about one-third longer than wide, widest near middle, narrowed toward each end, about one-half as wide at apex as base, distinctly tricarinate, median carina divided just beyond middle toward base; crown longer than width at base, widest at apex, carinae distinct; elytra about as wide as long, narrowed on outer margin to rounded apices on inner third, veins raised with round puncts.

Color: Front brown with four pairs of light markings, two before division of median carina; black puncts and a diagonal black band across apices of elytra with two white spots on margin in this black band; dorsum of abdomen usually with two longitudinal rows of white pustules on each side and sometimes a median light line.

Genitalia: In lateral view, pygofer of male more or less half-moon shaped, with a deep notch just below middle in caudal margin; anal segment with a pair of very long filament-like processes, as long as width of pygofer; aedeagus on basal two-thirds half as wide as length of pygofer, sharply curved into half circle and narrowed to sharp point on apical third; styles widest at base, gradually narrowed to rounded apices, straight. In ventral view, aedeagal brace not produced dorsally; styles widest at base, narrowed to apices, incurved on outer fourth.

Holotype ♂, allotype ♀, 46 ♂ and 100 ♀ paratypes, Inglis, Fla., March 9, 1947, R. H. Beamer; other paratypes: 7 ♂♂ and 22 ♀♀, same place and time,



L. D. Beamer; 12 ♂♂ and 12 ♀♀, Zolfo Springs, Fla., March 12, 1947, R. H. Beamer; 4 ♂♂ and 4 ♀♀, Gainesville, Fla., July 6, 1948, R. H. Beamer; 5 ♂♂ and 1 ♀, Lacoochee, Fla., July 7, 1948, R. H. Beamer; 12 ♂♂ and 7 ♀♀, Lake Placid, Fla., July 13, 1948, R. H. Beamer; 2 ♂♂ and 2 ♀♀, Waycross, Ga., March 18, 1947, R. H. Beamer; 1 ♂, Okefenokee Swamp, Ga., July 30, 1948, R. H. Beamer; 3 ♂♂, Okeechobee, Fla., March 17, 1947, R. H. Beamer; 6 ♀♀, Sanford, Fla., March 27, 1926, E. D. Ball; 1 pair, Sebring, Fla., Aug. 24, 1926, E. D. Ball.

Types and paratypes in Snow Entomological Collection; paratypes in the E. D. Ball Collection, U.S.N.M.

Macropterous form:

Like the brachypterous form but with flight wings about one-third their length longer than abdomen. Less marked with dark than most species. Veins with dark puncts evenly scattered over their length, with a dark spot on tip of clavus and with the normal V-shaped darker area on costal margin on outer third often broken into spots.

Holomorphotype ♀ and 27 ♀ paramorphotypes, Lake Placid, Fla., July 13, 1948, R. H. Beamer.

Types in the Snow Entomological Collections.

5. *Bakerella angulata* n. sp.

Brachypterous form:

Resembling *B. rotundifrons* Beamer but aedeagus in lateral view bent ventrally at right angle on outer third. Length ♂, 1.4 mm.; ♀ 1.7 mm.

Structure: Clypeus about one fourth longer than wide at widest place, widest near basal third, narrowed toward each end, more so at apex, definitely tricarinate, median carina divided near widest place in clypeus; crown about one fourth longer than width at base, widest at apex, definitely carinate; elytra about as long as wide, rounded on apices, veins slightly raised with a more or less even pattern of brown puncts.

EXPLANATION OF PLATE

1. *Bakerella bullata* n. sp., lateral view of right side of male genital capsule; 1a, lateral view of aedeagus enlarged; 1b, left side of anal segment without a process; 1c, caudoventral view of male genital capsule with styles and aedeagal brace.
2. *Bakerella spinifera* n. sp. lateral view of right side of male genital capsule; 2a, lateral view of aedeagus enlarged; 2b, caudoventral view of male genital capsule with styles and aedeagal brace.
3. *Bakerella pediforma* n. sp., lateral view of right side of male genital capsule; 3a, lateral view of aedeagus enlarged; 3b, caudoventral view of male genital capsule with styles and aedeagal brace.
4. *Bakerella minuta* n. sp., lateral view of right side of male genital capsule; 4a, lateral view of aedeagus enlarged; 4b, caudoventral view of male genital capsule with styles and aedeagal brace.
5. *Bakerella angulata* n. sp., lateral view of right side of male genital capsule; 5a, lateral view of aedeagus enlarged; 5b, caudoventral view of male genital capsule with styles, and aedeagal brace.
6. *Bakerella cornigera* n. sp., lateral view of right side of male genital capsule; 6a, lateral view of aedeagus enlarged; 6b, caudoventral view of male genital capsule with styles, aedeagal brace, and pair of black horns on connective.
7. *Bakerella penefusca* n. sp., lateral view of right side of male genital capsule; 7a, lateral view of aedeagus enlarged; 7b, caudoventral view of male genital capsule with styles, and aedeagal brace.

Color: General color varies from buff to dark brown; clypeus dark on apical third, remainder quite light, usually four pairs of median and three pairs of lateral light spots, two pairs of median light spots far before division of median carina; elytra with puncts dark and more or less apical dark band on outer half except apical pair of semicircular white spots; abdomen mottled.

Genitalia: In lateral view, pygofer of male almost triangular, widest on venter; anal segment with a pair of heavy processes curving ventrally; aedeagus widest at base, slightly narrowing throughout, curving ventrally almost at right angles on outer third, apex truncate, outer third sparsely set with short retrorse teeth; styles widest at base, gradually narrowing to sharp apices. In caudoventral view, aedeagal brace narrowly excavated; styles widest on basal third, narrowing to rounded apices, turned in on apical fifth.

Holotype ♂, allotype ♀, and 11 ♂ and 6 ♀ paratypes, Yankeetown, Fla., March 9, 1947, R. H. Beamer; other paratypes: 1 ♂, same place and collector, July 7, 1948; 3 ♂♂ and 1 ♀, Yankeetown, Fla., March 9, 1947, L. D. Beamer; 1 ♂, Sanford, Fla., March 11, 1947, R. H. Beamer; 1 ♂, La Belle, Fla., July 19, 1948, R. H. Beamer; 1 ♂, Inglis, Fla., March 9, 1947, L. D. Beamer; 3 ♂♂ and 2 ♀♀, Melbourne, Fla., March 17, 1947, R. H. Beamer.

Types in Snow Entomological Collections.

6. *Bakerella cornigera* n. sp.

Brachypterous form:

Closely related to *Bakerella cinerea* Beamer but usually with the median row of light spots on clypeus joined with the light median carina and the male genitalia with a pair of horn-like processes just below the processes on the anal segment. Length ♂, 1.8 mm.; ♀, 2 mm.

Structure: Clypeus slightly more than one-third longer than greatest width, widest near apical third, narrowed toward each end, more so toward apex, strongly tricarinate, median carina dividing near basal third; crown slightly longer than wide, widest at apex, carinae distinct; elytra about as wide as long, apex broadly rounded, almost parallel with side of scutellum, veins raised with a more or less even pattern of brown puncts; dorsum of abdomen with several raised pustules on each side.

Color: General color brown, mottled with lighter; clypeus almost black with five pairs of light, usually connected, median spots and four pairs of lateral spots on basal two-thirds; crown light with fovea darker; membrane of elytra semihyaline except large dark spot near apices and two lunate white spots on apical margins; pustules and median carina of abdomen usually quite light.

Genitalia: In lateral view, pygofer of male about one-fourth longer on ventral margin than on dorsal, sharply narrowed on ventral fourth; anal segment with a pair of sinuate processes as long as width of segment and another pair of black, diverging, curved processes caudally connecting the segment to the pygofer; aedeagus about twice as wide at base as just before apex, apex slightly enlarged with three short, retrorse teeth on dorsal margin; styles just visible as short, narrow, straight-sided shafts with

rounded apices. In caudoventral view, processes connecting pygofer to anal segment evident as very heavy, sharp, diverging, black processes; aedeagal brace narrowly and deeply excavated; styles widest at base, narrowing to incurved, truncated apices.

Holotype ♂, allotype ♀, and 1 ♂ paratype, Ashland, Pa., August 21, 1946, R. H. Beamer; other paratypes: 3 ♂♂, Cameron, Pa., August 21, 1946, R. H. Beamer; 1 ♂, Woodbridge, Va., August 28, 1946, R. H. Beamer.

Types in the Snow Entomological Collections.

7. *Bakerella penefusca* n. sp.

Brachypterous form:

Resembling *Bakerella fusca* Beamer but with five pairs of median light spots on the clypeus instead of three and aedeagus of male narrowed on ventral side instead of dorsal. Length ♂, 1.6 mm.; ♀, 2.1 mm.

Structure: Clypeus a little more than one-third longer than wide, widest near middle, narrowed toward each end, more so toward apex, strongly tricarinate, median carina divided near basal third; crown about as long as basal width, widest at apex, carinae distinct; elytra longer than wide, apices broadly rounded, more or less parallel with sides of scutellum, veins raised with usual dark puncts; dorsum of abdomen with a few pustules along sides.

Color: General color varies from light to quite dark; clypeus usually quite dark with three lateral pairs of light spots basad of middle and five median pairs, the apical ones very small and the two basal ones joining the carinae; elytra varying from almost entirely buff to about the outer third almost black, two white lunate apical spots on each elytra.

Genitalia: In lateral view, pygofer of male almost triangular, posterior-ventral corner extended wedge-shaped; anal segment with a pair of long, almost straight, processes with very sharp apices; aedeagus more than twice as wide at base as apex, sharply narrowed on ventral margin, near outer third to more or less rounded apex, with number of short sharp teeth on narrowed portion; styles widest at base, almost straight, suddenly narrowed near basal third to about one-fourth basal width, apices rounded. In caudoventral view, aedeagal brace narrowly and strongly excavated; styles widest at bases, sinuate and gradually narrowed to truncate apices.

Holotype ♂ and 10 ♂ paratypes, Canaan, N.H., August 11, 1946, R. H. Beamer; allotype ♀, and 11 ♀ and 15 ♂ paratypes, Storrs, Conn., August, 1946, R. H. Beamer; other paratypes: 1 ♂ and 1 ♀, Durham, N.H., August 12, 1946, R. H. Beamer; 1 ♂ and 1 ♀, Peck's Pond, Pa., August 20, 1946, R. H. Beamer.

Macropterous form:

Like the brachypterous form but with flight wings which extend about half their length beyond the abdomen.

Holomorphotype ♂, allomorphotype ♀ and 1 ♂ paramorphotype, Storrs, Conn., August, 1946, R. H. Beamer.

Types in Snow Entomological Collections.