NEW SPECIES OF CERATOCAPSUS (HEMIPTERA, MIRIDAE).¹

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Ceratocapsus camelus n. sp.

Distinguished by the slender form of the male, dark brownish black in color with a silvery, sericeous, pubescent band across middle of hemelytra; female brachypterous, hemelytra only extending to middle of abdomen, each corium strongly, tumidly convex on middle.

♂. Length 3.8 mm., width 1.08 mm. Head: width .73 mm., vertex .38 mm.; vertex convexly rounded, basal edge thin, slightly overlapping the collar; surface of the eyes conforming to the same surface plane as the frons and vertex; basal margin of vertex with four and frons with several erect, pale, bristle-like hairs. Rostrum, length 1.34 mm., reaching to base of hind coxae. Antennae: segment I, length .23 mm.; II, .75 mm., cylindrical, more slender at base, apical half slightly exceeding thickness of segment I; III, .47 mm., equal to thickness of segment I but more slender at base; IV, .47 mm., equal to thickness of segment III; clothed with short, fine, pale pubescence. Pronotum: length .82 mm., width at base 1.08 mm.; nearly campanulate in form, lateral margins sulcate, coxal clefts visible from above; disk strongly convex, smooth, shining, calli scarcely evident, collar flat and overlapped by the vertex.

Color dark brown to blackish, more black on pronotal disk and cuneus, shining; ostiolar peritreme white, somewhat protruding laterally. Hemelytra dark brown, translucent, strongly shining, embolar margins sinuate; with a silvery sericeous pubescent band across middle of corium and crossing

¹ Contribution from the Department of Zoology and Entomology, Iowa State College, Ames, Iowa.
the clavus near apex, also with similar sericeous pubescence at base of clavus and across middle of scutellum; beset with several erect, moderately long, yellowish, bristle-like hairs on scutellum, clavus and inner angles of corium, also intermixed with fine, short, simple pubescent hairs; cuneus scarcely de- flexed, uniformly brownish black, slightly paler at fracture. Membrane uniformly dark fuscous, bordering the cuneus, between and within the larger areoles except narrowly bordering the paracuneus, pale. Legs dark brown, tips of femora and the tarsi somewhat paler; coxae pale, darker on base, front pair reddish brown on apical half; hind femora decurved on apical half. Genital structures distinctive, right clasper bifurcate, each half curving in a semicircle, the tips nearly in contact; left clasper forked at base, dorsal prong projecting distad, apex acuminate, curved like a claw, also with a small spine beneath at base of claw, ventral half flattened, broad, then narrowing to acuminate apex; also third prong arising from left clasper at inner side of base, slender, sinuate, projecting distad, apical half curving to the right side.

♀. Length 2.8 mm.; brachypterous, width across abdomen 1.12 mm. Head: width .80 mm., vertex .52 mm.; head large, eyes rather small, frons, vertex and tyulus forming an arcuate line as viewed from the side. Rostrum, length 1.3 mm. extending slightly beyond middle of hind coxae. Antennae: segment I, length .22 mm., pale brownish; II, 1.77 mm., slightly tapering from base to larger at apex, brownish black; III, broken. The other antenna apparently deformed, segment II only 1.6 mm. in length. Pronotum: length .65 mm., width at base .67 mm.; disk strongly convex, base strongly depressed to a point below level of anterior margin, sides rounded and slightly sinuate, coxal clefts visible from above. Scutellum depressed, small, triangular, the mesoscutum visible, sharply declivent. Hemelytra brachypterous, reaching to middle of abdomen, depressed on base, corium tumidly convex on apical area, shining, apical and inner margins thickly clothed with silvery, sericeous pubescence, also beset with several erect, fine long hairs, also with similar hairs on the abdomen; cuneus and membrane absent. Base of venter with a frosted spot each side behind the coxa.

Holotype: ♂ August 21, 1926, Urbana, Illinois (Vera Smith); author’s collection. Allotype: same data as the type.
Ceratocapsus fascipennis n. sp.

Allied to camelus and having much the same color aspect but differs distinctly in structure of the genital structures; scutellum more convex, ostiolar peritreme with a reddish brown, laterally projecting tubercle.

♂. Length 4.3 mm., width 1.2 mm. Head: width .80 mm., vertex .37 mm.; form very similar to that of camelus. Rostrum, length 1.43 mm., extending to middle of metasternum. Antennae: segment I, length .28 mm., pale brownish, a reddish mark on ventral aspect; II, .86 mm., cylindrical, more slender at base, apical half slightly exceeding thickness of segment I; III, .47 mm., slightly exceeding thickness of first segment; IV, .47 mm., equal in thickness to segment III; dark brown to blackish; clothed with short, fine, pale pubescence. Pronotum: length .95 mm., width at base 1.21 mm.; form nearly as in camelus, but disk somewhat more strongly convex. Scutellum small, triangular, only very slightly convex, with silvery, sericeous pubescence across middle; mesoscutum prominent, strongly declivent to base of scutellum.

Color dark brown to blackish, shining, paler brown on clavus and basal half of corium; ostiolar peritreme white, with a reddish brown, laterally projecting tubercle; a silvery, sericeous pubescent band across clavus at about half way between apex and tip of scutellum, angling obliquely forward across corium; also with a similar but narrower sericeous band running obliquely across base of clavus and joining with similar pubescence on middle of scutellum. Scutellum with about eight, erect, pale bristles, and clavus with about as many but less prominent bristles; the whole dorsum also clothed with rather fine, short, simple pubescence. Membrane uniformly dark fuscous, areoles and narrowly bordering apex of cuneus, pale. Cuneus scarcely deflexed, embolar margins sinuate. Legs dark brown, coxae and trochanters pale, tarsi yellowish; hind femora decurved apically, tips pale; hind tibiae distinctly distinctly bowed.

Genital structures distinctive, base of left clasper with a slender, dorsally projecting prong, and decurved apically; right clasper with a simple, distally projecting process, slightly curved and thicker on basal half, with a small spine on inner side near base.

Ceratocapsus barberi n. sp.

Suggestive of *fascipennis* in having two transverse, silvery pubescent bands across hemelytra, but differs in the scarcely arched mesoscutum, flatter frons and vertex, straight femora, and very different genital structures.

♂. Length 4 mm., width 1.25 mm. Head: width .84 mm., vertex .30 mm.; vertex and frons flat, dorsal extremity of eyes extending very little above level of vertex. Rostrum extending to near hind margins of posterior coxae (imbedded in glue.) Antennae: segment I, length .25 mm.; II, .99 mm., slightly more slender on basal half; III, .56 mm., equal in thickness to apex of segment II; IV, .56 mm. equal in thickness to segment III; uniformly dark reddish brown, segment I paler and marked with dark red. Pronotum: length .69 mm., width at base 1.12 mm.; disk moderately and evenly convex, lateral margins slightly sulcate. Scutellum only very slightly convex, mesoscutum normal, nearly covered by pronotal disk.

Color rather uniformly dark reddish brown, disk of pronotum somewhat darker, entire surface strongly shining. Hemelytra with costal margins very slightly sulcate, with silvery, sericeous pubescent band cross base of clavus and middle of scutellum, also a second band crossing the corium and apical third of clavus. Cuneus scarcely deflexed, reddish brown like the clavus. Membrane uniformly pale fuscous, pale at base between larger areoles and bordering tip of cuneus. Clothed with fine, simple, pale yellowish pubescence, scutellum and clavus with several erect, bristle-like hairs. Ostiolar peritreme white, reddish on the protruding tubercle. Legs uniformly reddish brown, tarsi pale brownish. Genital claspers distinctive, right clasper short, slightly thickened, dorsal margin extending as a long slender hook, attaining dorsal median line of genital segment where it is sharply decurved and slenderly acuminated at tip.

*Holotype:* ♀ July 12, 1905, Huachuca Mts., Arizona (H. G. Barber), collected at light; author's collection. Named for my friend, Mr. H. G. Barber, who collected and presented the unique specimen.

Ceratocapsus oculatus n. sp.

Runs in my key (*Hemiptera Connecticut, 1923, p. 525*) to *fuscinus* Kngt., but differs from this and allied species by the
small size and short antennal segments; the male differs in
the large eyes, narrow vertex and nearly obsolete genae, also
by the simple form of the genital claspers.

♂. Length 2.6 mm., width 1.14 mm. Head: width .78
mm., vertex .17 mm.; eyes large, raised somewhat above level
of vertex, extending below to near the rostrum, the genae
reduced to a mere trace. Rostrum, length .91 mm., reaching
to near hind margins of middle coxae. Antennae: segment
I, length .20 mm.; II, .65 mm., nearly cylindrical, tapering
slightly on basal half; III, .39 mm.; IV, .35 mm.; segments
of nearly equal thickness, yellowish brown, last two segments
dark brown. Pronotum: length .54 mm., width at base 1.01
mm.

Color rather uniformly yellowish brown, cuneus reddish
brown. Membrane and veins fuscous, paler within the
areoles. Dorsum distinctly punctate, punctures infuscated.
Clothed with simple yellowish pubescence and intermixed
with silvery, sericeous pubescence, the latter less abundant.
Genital claspers distinctive; right clasper in the form of a
small rounded knob; left clasper thickened at the base but
without dorsal process, terminal portion curving about the
aedeagus, blade-like, acuminate at tip.

♀. Length 2.8 mm., width 1.25 mm. Head: width .69
mm., vertex .30 mm.; eyes much smaller and vertex broader
than in the male. Antennae: segment I, length .17 mm.; II,
.60 mm.; III, .39 mm.; IV, .38 mm. Pronotum: length .54
mm., width at base 1.05 mm. Pubescence and punctuation
very similar to that of the male.

Holotype: ♂ August 1, 1906, Brownsville, Texas, (A. B. Wol-
cott), "on Ebony at Old Fort Brown;" author's collection. Allo-
type: same data as the type. Paratypes: ♂, taken with types. 2
♂ Nov. 19, ♂ 2 ♀ Dec. 7, 1910, Brownsville, Texas.

Ceratocapsus fanseriae n. sp.

Allied to biformis Kngt. but size smaller and color more
brownish; differs in the more rounded curve of the ventral
hook of right genital clasper.

♂. Length 4.1 mm., width 1.3 mm. Head: width .65
mm., vertex .24 mm.; eyes moderate in size, vertex slightly
wider than dorsal width of an eye, with three or four fine
punctures on middle. Rostrum, length 1.22 mm., reaching to
near middle of hind coxae, pale to brownish. Antennae:
segment I, length .35 mm.; II, 1.25 mm.; III, .69 mm.; IV,
.39 mm.; all segments of nearly equal thickness, length of segment II greater than combined length of segments III and IV. Pronotum: length .60 mm., width at base 1.04 mm.

Dorsum rather closely and evenly punctate, each puncture infuscated; clothed with both simple and sericeous pubescence and intermixed with more sparsely placed, long, erect hairs. Color pale yellowish to brownish, scutellum, calli and cuneus dark brown to fuscous, the latter frequently with reddish brown tinge. Membrane fuscous, areoles and bordering cuneus pale. Legs fuscous brown, coxae and basal half of femora pale. Sternum dark brown, shining; ostiolar peritreme white, projecting as a blunt tubercle above opening of the canal. Genital claspers distinctive, rather similar to those of biformis, but ventral hook or right clasper more rounded, not angulate, the dorsal hook nearly touching the tip of the ventral hook.

♀. Length 3.6 mm., width 1.3 mm. Head: width .67 mm., vertex .30 mm. Antennae: segment I, length .34 mm.; II, 1.21 mm.; III, .69 mm.; IV, .43 mm. Pronotum: length .62 mm., width at base 1.08 mm. Slightly more robust than the male but very similar in punctuation, pubescence and coloration.


Ceratocapsus geminatus n. sp.

Allied to tricolor Kngt., but size smaller; differs distinctly in structure of the ostiolar peritreme and genital claspers.

♂. Length 3.9 mm., width 1.25 mm. Head: width .69 mm., vertex .32 mm.; vertex convex, slightly higher than dorsal margin of eyes. Rostrum (imbedded) apparently reaching upon hind coxae. Antennae: segment I, length .28 mm., yellowish, fuscous on base; II, 1.2 mm., cylindrical, more slender than I, brownish black, paler at base; III, .73 mm., black; IV, .56 mm., black. Pronotum: length .52 mm., width at base .97 mm.
Head and body uniformly dark brownish black, shining; hemelytra fuscous black, outer half of clavus, inner half of corium, and embolium except apically, pale; cuneus blackish, but with reddish tinge. Membrane uniformly pale fuscous, within areoles and bordering cuneus, pale. Legs dark reddish, tibiae pale reddish, tarsi pale, apices fuscous. Ostiolar peritreme distinctive, broad and flat as compared with *tricolor*. Clothed with fine, short pale yellowish pubescence, but punctures not evident on hemelytra as in *tricolor*. Genital structures distinctive; right clasper semicircular as in *tricolor*, but ventral hook shorter and broader, the dorsal hook with notch at tip forming two short spines which point mesad.

*Holotype*: ♂ July 21, 1898, Little Beaver, near Fort Collins, Colorado (E. D. Ball); author's collection. *Paratypes*: ♂ July 14, ♂ July 21, type locality (E. D. Ball).

*Ceratocapsus juglandis* n. sp.

Allied to *denticulatus* Kngr., but differs in the thicker antennal segments, more prominent eyes, darker scutellum but paler pronotum.

♂. Length 3.4 mm., width 1.25 mm. Head: width .78 mm., vertex .19 mm.; eyes prominent, projecting above level of vertex. Rostrum, length .99 mm., reaching upon intermediate coxae. Antennae: segment I, length .26 mm., pale to dusky, with red mark an anterior aspect near base; II, .95 mm., thickness .13 mm., nearly cylindrical, yellowish to fuscous; III, .60 mm., thickness .10 mm., fuscous; IV, .52 mm., fuscous. Pronotum: length .56 mm., width at base 1.08 mm.

Color pale yellowish, scutellum, cuneus, oblique band across apical half of corium and joining with inner angles of cuneus, dark fuscous; head and pronotum pale dusky brown. Membrane pale, apical area pale fuscous. Legs pale, hind tibiae fuscous brown. Clothed with fine, recumbent, yellowish pubescence, with slight tendency to fine sericeous hairs on clavus; also a row of four or five erect hairs on clavus. Genital claspers very similar to those of *denticulatus*, but right clasper terminating as two short spines of about equal length.

♀. Length 3.7 mm., width 1.4 mm. Head: width .71 mm., vertex .34 mm. Antennae: segment I, length .27 mm.; II, .99 mm.; III, .60 mm.; IV, .53 mm. Pronotum: length
.58 mm., width at base 1.17 mm. Very similar to the male in coloration and pubescence.

**Holotype:** ♂ June 20, 1928, alt. 6200 ft., Chiricahua Mts., Arizona (A. A. Nichol). **Allotype:** same data as the type. **Paratypes:** 14 ♂ ♀, taken with the types on Juglans major by Mr. Nichol. 4 ♂ ♀ May 16, 1928, alt. 4000 ft., Santa Rita Mts.; 3 ♀ May 27, 1928, alt. 3300 ft., Rincon Mts., Arizona (A. A. Nichol), all taken on Juglans major. ♀ July 23, ♀ Aug. 3, 1905, Huachuca Mts., Arizona (H. G. Barber).

With the series of material at hand I am now able to determine that the specimen I described as the allotype of denticulatus is in reality a female of juglandis. This illustration should emphasize the importance of describing and labeling the allotype of all species.

**Ceratocapsus decurvatus** n. sp.

Allied to *pumilus* Uhler but with stronger pubescence; differs in the absence of any tubercle on dorsal margin of genital segment; also the basal prong of right genital clasper strongly decurved ventrally.

♂. Length 3.7 mm., width 1.64 mm. Head: width .79 mm., vertex .216 mm.; eyes slightly larger and more prominent than in *pumilus*. Rostrum, length 1.21 mm., only attaining hind margins of middle coxae. Antennae: segment I, length .30 mm.; II, 1.04 mm.; III, .52 mm.; IV, .39 mm.; pale yellowish, segment I with the usual red mark near base, segments III and IV reddish. Pronotum: length .67 mm., width at base 1.31 mm.

Yellowish to reddish brown, calli and propleura fuscous brown, cuneus except outer margin reddish, legs uniformly yellowish. Membrane pale fuscous with brownish tinge, slightly paler across areoles and bordering tip of cuneus. Clothed with prominent, nearly erect, yellowish pubescence and intermixed on dorsum with silvery sericeous pubescence; more strongly pubescent than in *pumilus* although the fuscous punctures on dorsum very similar. Genital structures distinctive; basal prong of right clasper strongly decurved ventrally; without tubercle on dorsal margin of genital segment.

♀. Length 3.8 mm., width .88 mm. Head: width .73 mm., vertex .32 mm. Antennae: segment I, length .30 mm.; II, 1.04 mm.; III, .52 mm.; IV, broken. Pronotum: length
.67 mm., width at base 1.32 mm. Very similar to the male in color, pubescence and punctuation.

**Holotype:** ♂ July 23, 1909, Saugerties, New York (H. G. Barber); author's collection. **Allotype:** same data as the type. **Paratype:** ♂ July 6, 1919, Dauphin, Pennsylvania (T. L. Guyton). ♂ Aug. 14, 1914, Beltsville, Maryland (W. L. McAtee).

**Ceratocapsus truncatus** n. sp.

Runs to *pumilus* Uhler in my key (Hemiptera Connecticut, 1923, p. 525), but differs structurally in the truncate tip on basal process of the right genital clasper.

♂. Length 3.7 mm., width 1.56 mm. Head: width .75 mm., vertex .24 mm. Rostrum, length 1.25 mm., attaining posterior margins of hind coxae. Antennae: segment I, length .30 mm., yellowish, with red mark near base on anterior aspect; II, 1.03 mm., yellowish to brownish; III, .56 mm., brown; IV, .43 mm, brown. Pronotum: length .67 mm., width at base 1.25 mm.

Color rather uniformly brownish black, legs except hind femora, yellowish to brownish; cuneus with reddish evident on disk. Membrane uniformly fuscous, paler within areoles and bordering tip of cuneus. Dorsum with fuscous punctures as in *pumilus*; clothed with simple yellowish hairs and closely intermixed with silvery to golden, sericeous pubescence. Genital structures distinctive; basal process of right clasper about as broad as long, truncate apically, the lower apical angle produced slightly ventrally to a sharp point; middle process of right clasper shorter and broader than in *pumilus*, the terminal process also broader and irregularly serrate; tubercle on the left side of dorsal margin of genital segment large and more flattened than in *pumilus*.

♀. Length 3.77 mm., width 1.7 mm. Head: width .71 mm., vertex .30 mm. Antennae: segment I, length .28 mm.; II, 1.04 mm.; III, .54 mm.; IV, .41 mm. Pronotum: length .69 mm., width at base 1.29 mm. Very similar to the male in color, punctuation and pubescence.

**Holotype:** ♂ May 23, 1918, Gainesville, Florida (C. J. Drake); author’s collection. **Allotype:** same data as the type. **Paratype:** ♂, taken with the types “on Cephalanthus.”
Ceratocapsus husseyi n. sp.

Allied to sericus Knight., but differs distinctly in the structure of the genital claspers; perhaps can be separated by the fuscous apex of the second antennal segment.

♂. Length 4 mm., width 1.57 mm. Head: width .79 mm., vertex .32 mm. Rostrum, length 1.43 mm., reaching to middle of hind coxae. Antennae: segment I, length .36 mm.; II, 1.28 mm., yellowish, fuscous on apical one-third; III, .67 mm., fuscous, narrowly yellowish at base; IV, (broken); second segment with slightly longer and more prominent pubescence than in sericus. Pronotum: length .78 mm., width at base 1.3 mm.

Color dark brownish black, inner half of clavus, narrow base of corium, embolium, and base of pronotum, more yellowish; legs uniformly pale yellowish. Membrane uniformly fuscous, paler within areoles and bordering cuneus. Clothed with two types of pubescence, dorsum set with rather long erect hairs, scutellum, clavus, and corium also bearing closely appressed, silvery scale-like pubescence. Genital claspers distinctive; left clasper with an erect, incurved acuminate hook at base; middle hook projecting distally, the apical half curved upward, semicircular, tapering gradually to a sharp point; the third and ventral hook follows edge of genital segment and in form very similar to that in sericus. Right clasper differs very little from that found in sericus.

Holotype: ♂ June 27, 1921, Ann Arbor, Michigan (R. F. Hussey); author's collection. This is the specimen that the writer described as allotype of Ceratocapsus sericus Knight., but with the study of more material I am convinced that the male of sericus is the form described below.

Ceratocapsus sericus Knight, Hemiptera Conn., 1923, p. 530.

The male allotype is described as follows:

♂. Length 3.85 mm., width 1.6 mm. Head: width .78 mm., vertex .30 mm. Antennae: segment I, length .34 mm., pale yellowish; II, 1.29 mm., pale yellowish brown; III, .69 mm., reddish brown, pale at base; IV, .60 mm., dark reddish brown. Pronotum: length .73 mm., width at base 1.3 mm. Color, pubescence, and puncturation very similar to that of female. Genital claspers distinctive; left clasper with three prongs, the middle and dorsal prongs arising some distance from base, taking the form of a chela or pincer-like claw of crustaceans, the tips of each fork acuminate and curved
slightly upward. Right clasper in the form of a simple hook, without branches but curved on apical half.

Allotype: ♂ July 26, 1925, Huntington, Long Island, New York (F. M. Schott); author's collection.

Ceratocapsus pilophoroides n. sp.

Suggestive of Pilophorus in form of head and prothorax, but differs from that genus in the thickened antennal segments and absence of scale-like bands.

♀. Length 3.4 mm., width 1.38 mm. Head: width .80 mm., vertex .86 mm.; eyes and form of head very suggestive of the genus Pilophorus. Rostrum, length 1.34 mm., reaching upon hind coxae. Antennae: segment I, length .26 mm., yellowish brown; II, 1.04 mm., tapering to slightly thicker apically, brown, slightly paler at base; III, .67 mm., brown; IV, .60 mm., dark brown. Pronotum: length .69 mm., width at base .07 mm.; disk convex and sides strongly sulcate as in Pilophorus.

Color yellowish brown to dark brown, hemelytra paler, dull to slightly pruinose, apical area of corium and the cuneus dark brown and shining; a moderately distinct pruinose band across middle of clavus and basal angle of corium, but without scales. Membrane pale or whitish, veins brown. Embolar margins sinuate, broader on apical area. Mesoscutum broadly exposed, declivent behind, scutellum small, convex apically; ostiolar peritreme white, size moderate. Venter dark brown, strongly shining. Clothed with simple, erect pubescent hairs, a few hairs longer than others, but without trace of scale-like pubescence.

Holotype: ♀, Topeka, Kansas (Popenoe); author's collection. This form is so distinct it may be recognized from the female sex.

Ceratocapsus neoboroides n. sp.

Resembles Neoborus in several respects, but distinguished by the thickened antennal segments and converging type of arolia.

♀. Length 3.2 mm., width 1.56 mm. Head: width .73 mm., vertex .35 mm.; frons granulate and finely punctate, median line impressed, the whole closely matted with silvery sericeeous pubescence. Rostrum, length 1.08 mm., just attaining posterior margins of middle coxae. Antennae: segment
I, length .25 mm.; II, .67 mm., not equal to width of head; III, .39 mm.; IV, .36 mm.; yellowish to brownish. Pronotum: length .62 mm., width at base 1.25 mm.; calli distinct, granulate, darker in color than disk; lateral margins distinct, in fact the whole pronotum is very similar to that found in Neoborus.

Dorsum rather finely and closely fusco-punctate, vertex and calli granulate. Clothed with semi-erect, simple yellowish pubescence and closely intermixed with more recumbent, silvery, scale-like pubescence. Color yellowish to brown, calli brownish black, margins of scutellum and clavus, and the embolium paler. Legs yellowish, tibiae more brownish. Membrane and veins pale fuscous brown, paler on central area.

Holotype: ♀ April 20, 1926, Santa Cruz river, Pima County, Arizona (A. A. Nichol).

This species is so different from the known species of Ceratocapsus that it may be easily recognized from the female characters.

Ceratocapsus pilosulus n. n.

A new name to replace Ceratocapsus pilosus Knight (Hemiptera Conn., 1923, p. 526) which is preoccupied by Ceratocapsus pilosus Reuter (Öfversikt af Finska Vet.-Soc. Forhandlingar, xlvii, 1905, no. 20, p. 34), a species described from Venezuela.