

STUDIES OF THE GENUS SCAPHOIDEUS
(HOMOPTERA, CICADELLIDAE)

PART II. NINE NEW NORTH AMERICAN SPECIES AND
DESCRIPTIONS OF FIVE MALE ALLOTYPES

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In a recent paper¹ (Part I) the genus was discussed and seventeen new species were described on the basis of the internal male genital characters. The present discussion is a continuation of this study using the internal male structures to establish several species already described, from females only, by Professor Herbert Osborn. The allotypes of these species are placed with the types in the Osborn Collection. Several species are described also which belong to the *productus-carinatus* group and which have previously been confused with these two species.

Scaphoideus veterator n. sp.

Resembling *frisoni* in form and general appearance but paler in color and with distinct genitalia. Length, 6-7 mm.

Vertex strongly produced and sharply angled, a little longer at middle than basal width between eyes.

Color: Face pale brown with at least two dark arcs above. The dark line just beneath margin of vertex and the one just above interrupted at middle. Vertex pale, median transverse band reddish brown, central portion darker. Pronotum brown with a paler transverse band behind eyes. Scutellum brown, the apical half white. Elytra white tinged with brown, veins dark brown.

Genitalia: Female last ventral segment with posterior margin roundedly produced, the apex slightly notched. Male plates longer than combined basal width, broad at base concavely narrowed on apical third to form blunt, pointed apices. Styles broad at base, concavely, abruptly, narrowed to form slender, pointed caudally directed apical third. Oedagus in ventral view with a pair of long processes arising near base slightly constricted at about one-third their length, beyond which they are broadened and gradually tapered to long slender pointed apices. These two processes cross so that the apical fourth is directed laterally. Dorsal process in lateral view with

¹Amer. Mid. Naturalist. 17: 965, November, 1936.

apical portion rather long, curved caudally, apex blunt, rounded, a slight tooth on dorsal edge.

Described from one male and three female specimens collected at Loyalsock, Pa., August 12, 1918, by J. G. Sanders; one male, Cedar Run, Pa., July 12, 1920, J. N. Knull; one female, Port Trevoiton, July 26, 1918, J. G. Sanders. Holotype male and allotype female (Loyalsock, Pa.) and male and female paratypes in collection of senior author.

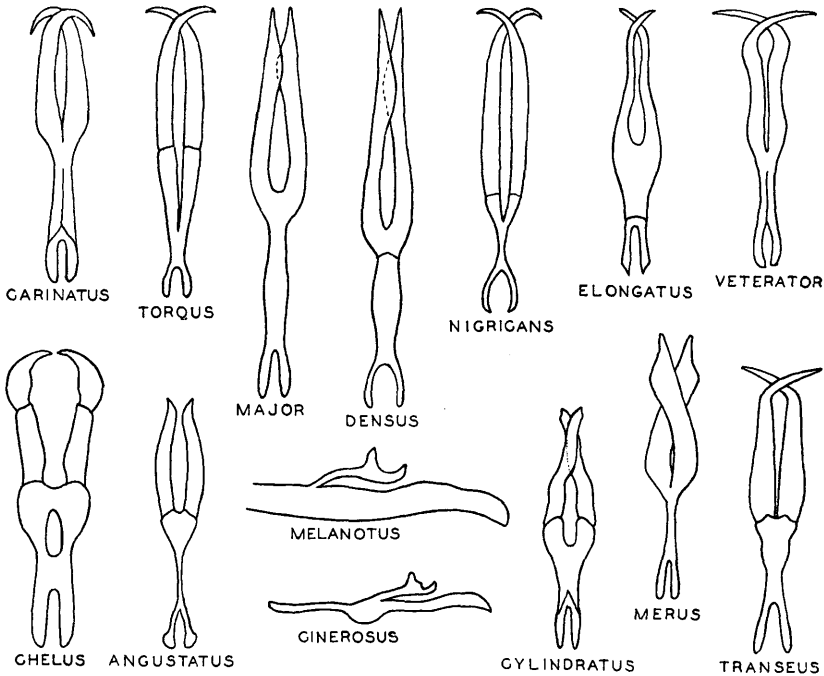


FIG. 1. Ventral views of male oedagi as labeled except in cases of *melanotus* and *cinosus* which are lateral views.

This species differs from *transeus* in having more bluntly pointed plates and by having a dorsally produced portion on the connective. It differs from *frisoni* which has a more constricted portion in oedagus, blunter pointed plates, longer slender curved tips of styles and a tooth on lower caudal portion of pygofer.

***Scaphoideus angustatus* n. sp.**

Resembling *frisoni* in form and appearance but with distinct genitalia. Length, 6 mm.

Vertex strongly produced and bluntly angled, a little wider between eyes at base than median length.

Color: Face pale with two heavy arcs above. The general coloration is essentially like *veterator*. The transverse band on disc of vertex strongly produced anteriorly at middle. Elytra rather pale brown, veins darker.

Genitalia: Male plates not quite as long as combined width at base, broad at base, convexly rounded then narrowed to blunt, pointed apices. Styles abruptly narrowed at two-thirds their length to form long, narrow processes which are curved slightly outwardly. Oedagus in ventral view with a pair of long processes arising near base and extending caudally. These are dorso-ventrally flattened, curved inwardly at apices and are separated at middle. The pointed apices are formed by the curvature of the inner margin as it meets the outer margin. Dorsal process extending ventrally between the two ventral processes of oedagus.

Described from two male specimens collected in Pennsylvania. One was collected at Ohio Pyle, July 20, 1919 (D. M. DeLong); and the other at Speeceville, July 3, 1917, by J. G. Sanders. Holotype male, Speeceville, Pa., and paratype male in collection of senior author.

This species can be distinguished from *merus* which it most closely resembles by the more narrow processes of the oedagus, by having the plates more pointed at apex, the apices of styles more slender and straight, and the apical portion of the dorsal process more narrow and without a dorsal tooth at the apex.

Scaphoideus merus n. sp.

Resembling *carinatus* in size, form and general appearance, but with distinct genitalia. Length, 6.5-7 mm.

Vertex strongly produced, apex bluntly angled, almost as long at middle as basal width between the eyes.

Color: Face pale with two heavy dark bands below margin of vertex. Marginal line above, broken at middle and widened either side at apex. Median transverse band on vertex decidedly notched either side of central anterior produced portion, causing it to appear trilobate anteriorly. Pronotum and scutellum dark brown, mottled. Elytra white, washed with pale brown, veins, margin at apex and a spot on center of clavus dark brown.

Genitalia: Female last ventral segment with prominent lateral angles, posterior margin almost truncate, slightly emarginate either side of middle and black margined. Male plates short and broad, length equalling combined basal width, convexly rounded to form blunt apices, styles abruptly narrowed at two-thirds their length to form narrow processes which are bent strongly outwardly and produced. Oedagus in ventral view with a pair of short broad, flat processes arising near the base, curved so as to leave an opening between them at base but overlapping at apex. The inner margin curves and slopes to outer margin so as to form a pointed apex. Dorsal process with the apical portion rather broad, rounded at apex and with a dorsal pointed tooth.

Described from a series of four female and seven male specimens collected at Washington, D. C., July 3, 1919, (Sanders); two females, Ohio Pyle, Penna., July 19, 1919, (DeLong); one female, Charter Oak,

Penna., (Kirk and Champlain); one male, Port Trevoiton, Penna., July 26, 1918, (Sanders); one male, N. Bloomfield, Penna., July 26, 1920, (Sanders); one male, Richfield, Penna., July 16, 1918, (Sanders); one male, Chambersburg, Penna., June 14, (Knull).

Holotype male, allotype female (Washington, D. C.) and male and female paratypes in collection of senior author. Male and female paratype in Illinois Natural History Survey Collection, Urbana, Illinois.

Scaphoideus torqus n. sp.

Resembling *major* in general appearance, but with distinct genitalia. Length, 6.5 mm.

Vertex strongly angled, apex blunt, almost as long at middle as basal width between eyes.

Color: Face pale brownish with at least three heavy brown arcs above. Brown line below vertex margin heavy, the one above more narrow and interrupted at middle. Vertex pale, band on disc rather narrow and slightly produced anteriorly at middle. Pronotum and scutellum tawny. Elytra pale, veins brown, darker on posterior half.

Genitalia: Male plates about as long as combined basal width tapered to bluntly pointed apices. Basal two-thirds of styles broad, apices narrow, long and gently curving outwardly at tips. Oedagus in ventral view composed of two portions which are separated at base but curve inwardly and cross anterior to the apices which are directed laterally. The dorsal process with apical portion tapered, bluntly pointed and not bearing a dorsal tooth. The upper apical portion of pygofer with a distinct tooth which will readily separate this species from those closely related.

Described from three male specimens, one collected at North East, Pa., July 30, 1919, (D. M. DeLong); one at Harrisburg, Pa., July 7, 1918, (J. G. Sanders); one at Castle Rock, Grand Detour, Ill., July 2, 1932, (Dozier and Mohr). Holotype male, North East, Pa., and male paratype in collection of senior author. Male paratype in State Natural History Survey Collection, Urbana, Illinois.

Scaphoideus elongatus n. sp.

Resembling *cirrus* in form and appearance but with distinct genitalia. Length, 6.5-7 mm.

Vertex strongly angled, apex blunt, slightly wider between eyes at base than median length.

Color: Face pale, slightly smoky with dark arcs above. A slender black line just beneath margin of vertex, the one above a little broader either side of median line where it is broken. Median transverse band on disc of vertex rather narrow, tawny and strongly produced anteriorly at middle. Pronotum and scutellum brownish mottled with white. Apical half of scutellum paler. Elytra white, veins dark brown, fuscous blotches forming an indefinite oblique band from anterior claval area to median costal area. Apices smoky.

Genitalia: Female last ventral segment almost truncate, slightly produced, and slightly concavely rounded at middle. Male plates

longer than combined width at base, gradually narrowed to pointed apices. Styles very broad at base, abruptly narrowed at about half their length to form long slightly curved tapering apices. Oedagus in ventral view composed of a pair of processes which taper to pointed apices and which overlap. These are curved so as to be contiguous at middle and be separated anterior to and posterior to this point. The pygofer is unusually long and pointed. This alone will separate the species from all others except *chelus*, which has a very different oedagus.

Described from two male and one female specimens collected at Waynesburg, Pa., July 16, 1919, by the senior author; and four female specimens, one each from Anacostia, D. C., August 22, 1905, (J. G. Sanders); Chain Bridge, Va., August 13, 1905, (J. G. Sanders); Greenfield, Pa., August 28, 1920, (D. M. DeLong); Tupelo, Miss., July 1, 1921, (C. J. Drake); and Starved Rock, Illinois, July 14, 1932, (Dozier and Park). Male holotype, female allotype (Waynesburg, Pa.) and male and female paratypes in collection of senior author. Male paratype is in State Natural History Survey collection, Urbana, Illinois.

Scaphoideus cylindratus n. sp.

Resembling *frisoni* in general appearance but with blunter head, darker color and distinct genitalia. Length, 6–6.5 mm.

Vertex rather strongly angled, blunt at apex, about as long at middle as basal width between eyes.

Color: Face pale brown with broken arcs and two continuous dark lines beneath margin of vertex. Marginal line above slightly broken at middle. Vertex pale, transverse band on vertex narrow, slightly produced at middle and pale orange in color. Pronotum uniform brown, scutellum paler with basal angles dark. Elytra rather uniform dull brown in color with veins and apex darker but almost devoid of areolar markings.

Genitalia: Female last ventral segment broadly roundedly produced and black margined on central half. Male plates almost one-third longer than combined width at base, convexly rounded and tapered to pointed apices. Apical third of styles composed of long, slender, tapering processes. Oedagus in ventral view composed of a pair of rather short, broad cylindrical processes which are bluntly pointed and slightly curved upwards at apex. Dorsal process rather long, apical portion slender and tapered to blunt tip.

Described from a series of six female and one male specimens collected at Kane, Pa., August 18, 1921, and 22, 1919, (D. M. DeLong); male, Loyalsock, Pa., August 2, 1918, (J. G. Sanders); male, Ft. Kent, Maine, August 28, 1910, (Herbert Osborn); Ithaca, N. Y., August 1, 1905; Urbana, Ill., July 2, 1920, (C. P. Alexander). Holotype male, Loyalsock, Pa., allotype female, Kane, Pa., and male and female paratypes in senior author's collection. Paratype male (Urbana, Ill.), Illinois State Natural History Survey collection, Urbana, Illinois.

Scaphoideus chelus n. sp.

Resembling *major* in form and general appearance but darker and with distinct genitalia. Length, 6-7 mm.

Vertex rather sharply angled, median length equalling basal width between eyes.

Color: Face slightly tawny with one broad and several narrow arcs above. A dark line just below vertex and a slender one above, broken at middle. Vertex pale with a rather broad and somewhat poorly defined transverse band between eyes, tawny. Pronotum and scutellum brown, the former with a paler indistinct band. Elytra brownish, veins dark brown.

Genitalia: Female last ventral segment with prominent angles, posterior margin slightly produced to form a median rounded lobe which is slightly emarginate at apex. Male plates rather short and broad, a little longer than combined basal width, convexly rounded to blunt apices. Styles with apical third narrow, tapering to pointed apex and curved slightly outwardly. Oedagus in ventral view with a pair of separated processes arising from basal portion which extend caudally and bear at their apices a pair of curved, broad, pincher-like processes which taper to sharp pointed proximal apices. Dorsal process with a rather long tapering apical process which curves slightly upward and is bluntly pointed at apex.

Described from a male and two female specimens collected at Dolson (Rocky Branch) Illinois, July 18, 1934, by H. H. Ross and the senior author, and one male specimen from Alton, Illinois, June 27, 1934, by the same collectors. Holotype male and allotype female (Dolson) in State Natural History Survey collection, Urbana, Illinois. Male and female paratype in collection of senior author.

Scaphoideus transeus n. sp.

Resembling *major* in form and general appearance but with distinct genitalia. Length, 5.5 mm.

Vertex strongly produced and bluntly angled, median length equaling basal width.

Color: Face pale, a narrow black line beneath the margin of vertex and a broader one ventral to this. Marginal line above broken at middle and broadened either side of apex. Vertex white, transverse median band orange at sides darker at middle and anteriorly produced. Pronotum and scutellum pale brown, veins, apex and spot on median costa dark brown.

Genitalia: Female last ventral segment with posterior margin slightly produced, median fourth with a rather broad, shallow notch. Male plates longer than combined basal width, narrowed almost from base to form long pointed tips with blunt apices. Apical half of styles narrow, tapered to pointed apices and almost straight. Oedagus in ventral view composed of a pair of processes which are broad and proximal at base and which diverge to apex of plates where they bend inwardly, cross and taper to long pointed apices. Dorsal process of oedagus with a rather long curved rather narrow apical portion.

Described from a male and female collected at Dolson, Illinois (Rocky Branch), July 18, 1934, (Ross and DeLong); one male, Galena, Illinois, July 10, 1934 (Ross and DeLong); one male, Ames, Iowa, June 22, 1896, (Herbert Osborn); one male, Washington, D. C., without date. Holotype male, Ames, Iowa, in Herbert Osborn collection. Allotype female and paratype males from Illinois in State Natural History Survey collection, Urbana, Illinois. Male paratype, Washington, D. C., in senior author's collection.

Scaphoideus densus n. sp.

Resembling *major* in form and general appearance but smaller and with distinct genitalia. Length, 6-6.5 mm.

Vertex strongly produced and angled, a little wider between eyes than median length.

Color: Face pale with three dark lines on upper portion. Marginal line on vertex broken at middle and broadened either side. Median band narrow, obliquely sloping to margin on either side and strongly produced at middle, tawny. Pronotum and scutellum brownish, elytra white, washed with pale brown, a spot on anterior clavus and apex of elytra dark brown.

Genitalia: Female last ventral segment slightly produced, rounded and broadly black margined. Male plates about as long as combined basal width, apical half sloping to bluntly pointed apices. Styles broad, convexly, roundedly constricted and notched at two-thirds their length forming rather long, outwardly curved, bluntly pointed apices. Oedagus more than one-third longer than connective, two branched, each arm broadened on inner margin one-third the distance from apex and tapered to a sharp pointed tip. In lateral view the oedagus is broadened near apex, curved and tapered to pointed tip. Dorsal process very broad at base with a short thick apical portion which is rounded at apex and bears a dorsal spine.

Described from a series of two male and two female specimens collected at Elizabethtown, Illinois, May 27, 1931, and June 25, 1932, by Ross, Dozier and Park; one male, Bluff Springs, Illinois, June 10, 1932, Ross and Mohr; one male, Eichorn, Illinois, June 13, 1934, Ross and DeLong; one male, Little Mt., Ohio, August 21, 1904, (Osborn collection); and one male, Rigaud, Quebec, August 4, J. O. Quellet.

Holotype male (Rigaud, Quebec) in author's collection. Allotype female and male and female paratypes in Illinois State Natural History Survey collection, Urbana, Illinois. Paratype male in Herbert Osborn collection.

Scaphoideus cinerosus Osborn

Scaphoideus cinerosus Osborn. Jour. Cinc. Soc. Nat. Hist. 19: 208, 1900.

Male plates rather short, broadly rounded at apex. Styles broad at base, tapered to slender, outwardly bent and pointed apices. Oedagus in ventral view appearing two-branched with processes long, straight and tapered to pointed apices. In lateral view enlarged at about one-half its length then constricted with the apical third broadened apex

curved on dorsal portion to a ventral sharp pointed tip. Dorsal process arising from enlarged process at middle, expanded at apex with a blunt rounded anterior process, a curved finger process caudally and a median dorsal tooth.

Allotype male, Granville, Ohio, July 25, 1928, in Herbert Osborn collection.

Scaphoideus nigricans Osborn

Scaphoideus nigricans Osborn. Ohio Nat. 11: 258, 1910.

Male plates as long as combined basal width, tapered from base to bluntly pointed apices. Styles long, concavely narrowed at about one-third their length and again near the apex so that the terminal fourth is produced into a slender curved finger-like process. Oedagus two-branched, processes long, curved inwardly, crossed near apex and tapered to pointed tips. In lateral view with processes curved upwardly and anteriorly at apex. The dorsal process long, broad at base, rather abruptly narrowed and produced into a long, caudally directed, bluntly pointed process.

Allotype male, Black Mt., N. C., June, in Herbert Osborn collection, Ohio State University.

Scaphoideus melanotus Osborn

Scaphoideus melanotus Osborn. Jour. Cinc. Soc. Nat. Hist. 19:206, 1900.

Male plates one-fourth longer than combined basal width, scarcely narrowed toward apices which are broadly rounded. Styles suddenly narrowed, apical fourth long, slender, strongly curved outwardly. Oedagus in lateral view broad, apex broadly, bluntly rounded. Dorsal process rather slender at base, broader apically, forming two short divergent processes. Pygofers with a pair of spines at apex which are large and turned inwardly.

Allotype male, Ames, Iowa, 7-30-96, in Herbert Osborn collection, Ohio State University.

Scaphoideus productus Osborn

Scaphoideus productus Osborn. Jour. Cinc. Soc. Nat. Hist. 19:200, 1900.

In the Osborn collection is a series of four cotypes, all females, two of which are undoubtedly the same species and have the strongly produced female segment described by Professor Osborn in the original description. Since it seems necessary to choose a lectotype at this time the specimen labeled "Experiment Station, Ames, Iowa, Aug. 7, 97" is designated. It has been impossible to choose a male allotype because all those which are similar in form and color have been definitely associated with female specimens which do not have the strongly produced segment.

Scaphoideus major Osborn

Scaphoideus immistus var. *major* Osborn, Jour. Cinc. Soc. Nat. Hist., 19:205, 1900.

The type of this species described by Professor Osborn is labeled "Ames, Iowa, 7-30-96." The male allotype is labeled "Ames, Iowa,

6-27-96." Both are in the Osborn collection. The internal genitalia have not been described.

Male plates not quite as long as combined basal width strongly convexly rounded to bluntly pointed apices. Styles tapered from base, strongly and suddenly narrowed on outer margin so that the apical fifth is a short outwardly curved finger-like process. Oedagus about the length of the connective, two-branched, in ventral view appearing broadened on inner margins about one-third the distance from apex and tapered to pointed tips. In lateral view the oedagus is tapered to a long attenuated pointed apex. Dorsal process semicircular, tapered to apex which is blunt, slightly enlarged and with a very small dorsal spine.

Scaphoideus carinatus Osborn

Scaphoideus carinatus Osborn. Jour. Cinc. Soc. Nat. Hist. 19:201, 1900.

Two female cotypes are in the Osborn collection. The specimen labeled Hanover, N. H., C. M. Weed is designated as the lectotype. A series of five female and one male specimens are in the Osborn collection labeled Little Mt., Ohio, Aug. 21, 1904. These are females agreeing exactly with the type and the corresponding male is here described and designated as the allotype.

Male plates about as long as combined width at base, sloping gradually from base to near apices where they are abruptly narrowed on outer margins, then produced to sharp pointed apices. Inner margins of plates curved outwardly at apex. Styles broad at base, abruptly narrowed near apex to form short finger-like processes which are curved outwardly at apices. Connectives long, reaching two-thirds the length of plates and with dorsal structures which are broad and vertical. Oedagus in ventral view two-branched, processes short and thick, usually crossed and curving caudally and dorsally into segment. The dorsal process is short and thick, usually lying in the concavity of the curved oedagus processes.

Allotype male, Little Mt., Ohio, Aug. 21, 1904, in Herbert Osborn collection, Ohio State University.
