

- ff.* Scutellum without a darker median line.
- g.* Disk of pronotum with a small fuscous mark behind each callus; ventrals fuscous-brown, a lateral pale stripe dividing the dark color. 816. SEMIVITTATUS.
- gg.* Disk of pronotum with a distinct black ray or spot behind each callus; sides of ventrals without a pale stripe.
- h.* Disk of pronotum with a black stripe covering outer half of each callus and extending back to basal margin; general color pale yellowish, clavus, apical fourth of corium and embolium black. 817. VITTICOLLIS.
- hh.* Disk of pronotum with the black stripes behind the calli not reaching basal margin.
- i.* Pronotal disk with a conspicuous nearly square black spot behind each callus; ground color yellowish-brown, hind femora except tips, blackish. 818. ATRINOTATUS.
- ii.* Pronotal disk with a conspicuous black stripe behind each callus, this broadening toward base; ground color yellowish-brown with fuscous more or less tinged with pinkish; hind femora reddish-brown with vague pale rings near tips. 819. LAURÆ.

810 (—). *LYGUS CARYÆ* Knight, 1917, 615.

*Male*—Elongate-oblong, sides subparallel. Color above, except head, cuneus and membrane, a nearly uniform fuscous-black, rather thickly clothed with prostrate yellow hairs; head dull yellow with fuscous markings; basal angles of scutellum, embolium and sometimes a vague stripe along corium, yellowish heavily tinged with dusky; cuneus pale yellowish, its tip and inner basal angle fuscous; membrane dark fuscous; veins slightly paler; legs greenish-yellow, the apical halves of hind femora fuscous-brown, middle femora with two vague subapical dark rings; tip of beak and tarsi and spines of tibiæ fuscous. *Female*—Larger and more oval. Dark fuscous-brown; head, pronotum except calli, middle of scutellum, embolium and basal half of corium in great part, dull yellow; cuneus, membrane and legs as in male; under surface dull yellow with a broad fuscous stripe along the sides. Joints 1 and 2 of antennæ fuscous-brown, the incisures pale; 1 two-thirds as long as width of head across eyes; 2 three times as long as 1; 3 and 4 dusky yellow, 3 one-half the length of 2, 4 two-thirds as long as 3. Pronotum finely and closely rugose-punctate. Elytra finely scabrous or granulate-punctate. Length, 5—5.8 mm.

Marion and Posey counties, Ind., May 11—June 19; beaten from hickory (*W. S. B.*). Conesus Lake, N. Y., and Glen Ellyn, Ill., June (*Gerhard*). Staten Island, N. Y., June 6 (*Davis*). The known range extends from New England and New York west to Wisconsin and southwest to Mississippi. Breeds on hickory, walnut and pecan. A var. *subfuscus* Knight has the scutellum, basal half of corium and embolium paler. Specimens of this, taken on pecan May 11, at Millbrook, N. Car., were received from Brimley.

811 (—). *LYGUS JOHNSONI* Knight, 1917, 629.

Elongate, subparallel, male, more oval, female. Dull greenish-yellow, sparsely clothed with short prostrate yellowish hairs; tylus black, its base and cheeks brownish; basal half of calli and a short broad ray behind them, inner half of clavus, claval suture and an elongate wedge along middle of corium, fuscous-brown; membrane with cells fuscous, the base and apical half paler; legs greenish-yellow; under surface greenish-yellow, its sides with a broad black stripe their full length; apical halves of tarsi and tip of beak blackish. Joints 1 and 2 of antennæ black, the former often paler at base, 3 and 4 pale fuscous; 1 slightly more than two-thirds as long as width of head across eyes, 2 three times the length of 1, 3 three-fifths as long as 2, 4 two-thirds the length of 3. Pronotum, except calli, and scutellum finely transversely rugose, the former with punctures scarcely evident. Elytra finely and evenly scabrous. Length, 5.7—6 mm.

Marshall Co., Ind.; June 25 (*W. S. B.*). McLean and Ithaca, N. Y., June 20—July 27 (*Davis and Gerhard*). Recorded only from Vermont, Connecticut and New York. Knight found it breeding in New York on the hornbeam or water beech, *Carpinus caroliniana* Walt., the eggs being deposited in late July in the soft punky stubs of old dead limbs.

812 (1020½). *LYGUS COMMUNIS* Knight, 1916, 346.

Pale brownish- or dull greenish-yellow with darker brown or fuscous markings, thinly clothed with fine appressed grayish hairs; apical half of tylus brown, front of head more or less reddish; pronotum with a blackish stripe beginning at the outer margin of each callus, prolonged backward and gradually evanescent before reaching hind margin, the disk between the stripes usually tinged with fuscous; apical fourth of corium with an ill defined dark brown to fuscous bar crossing tip of embolium; cuneus yellowish-translucent; membrane with basal half fuscous, apical half dusky with a large pale submarginal spot enclosing a dusky one; legs brownish-yellow, more or less tinged with reddish, the apical third of hind femora reddish with two vague pale rings; under surface greenish-yellow, the sides with a broad reddish stripe extending their full length, and in male covering the genital plate. Antennæ with basal joint brownish-yellow, remainder darker brown to fuscous; joint 1 one-third longer than width of vertex, 2 three and one-half times the length of 1, 3 one-half as long as 2, 4 slightly longer than 3. Vertex without impressed line near base. Pronotum with calli prominent, disk transversely rugose, its punctures fine, indistinct. Elytra finely scabrous. Male genitalia as in fig. 173, *B.* Length, 5.5—5.8 mm.

Batavia, N. Y., August (*Gerhard*). Known as the "false tarnished plant bug." Ranges from New England west to Michigan, Colorado and British Columbia, and south to Virginia. Breeds on cultivated pear, often doing much damage to

both foliage and fruit; also on dogwood, and occurs on prickly ash.<sup>62</sup> A pale slender form, which preys upon apples in Nova Scotia, Knight (1916, 349) named var. *novascotiensis*.

813 (—). *LYGUS PARROTTI* Knight, 1919, 21.

General color yellowish to brownish; pronotum with a fuscous-brown ray behind each callus; elytra with dark markings as in key, cuneus yellowish-hyaline; membrane fuscous, veins and basal half of cells paler; legs dull yellow, apical half of hind femora fuscous with two pale rings; ventrals yellowish, sides and genital region fuscous. Joints 1 and 2 of antennæ straw-yellow, 1 two-thirds as long as pronotum, 2 three and one-third times longer than 1; 3 and 4 pale fuscous, 3 nearly three-fifths the length of 2, 4 as long as 1. Beak reaching base of hind coxæ. Length, 5.1 mm.

Recorded only from Geneva, N. Y., where it breeds on *Viburnum*.

814 (—). *LYGUS PARSHLEYI* Knight, 1917, 611.

General color yellowish-brown; head with cheeks, loræ and apical half of tylus darker; pronotum with dark markings as in key, the rays behind calli sometimes merging on base, leaving only the center of disk pale; scutellum darker on sides; clavus and apical two-thirds of corium and embolium dark brown; cuneus pale yellowish-translucent; membrane pale fuscous, sides of veins, basal half of cells and spot near tip of cuneus pale; legs as in *communis*; ventrals dull yellow, sides and genital area dark brown. Joints 1 and 2 of antennæ yellowish-brown, apex of 2 blackish; 1 one-third longer than width of vertex, 2 nearly three times longer than 1; 3 and 4 fuscous, 3 three-fifths the length of 2, 4 nearly three-fourths as long as 3. Beak reaching between hind coxæ. Length, 4.8—5 mm.

The typical form is recorded only from Maine and New Hampshire. Examples of a var. *shermani* Knight, taken at Highlands, N. Car., July 6, were received from Brimley. It is known only from that State, is more brownish than black, with dark rays on pronotum; second antennal shorter, wholly dark brown to blackish or with basal half pale. Length, 5.6—6 mm.

815 (—). *LYGUS UNIVITTATUS* Knight, 1917, 623.

Dull greenish- or brownish-yellow, more or less marked with reddish and fuscous, sparsely clothed with yellow pubescence; head greenish-yellow flecked with numerous reddish points or dots; pronotum with blackish rays evanescent behind; elytra greenish-yellow, tinged with reddish, clavus along the commissure and apical third of corium dark brown to fuscous, embolium greenish-yellow tinged with reddish; membrane with cells fuscous, veins pale, apical half dusky; legs greenish-yellow, femora heavily tinged with reddish-fuscous, tibiæ more lightly

<sup>62</sup>For a full account of its life history and destructive habits see Bull. 368, Geneva, N. Y. Agr. Exp. Station, 368—384.

so; beak with reddish lines, its tip and apical half of tarsi fuscous; under surface in great part reddish-fuscous, the median portion greenish-yellow. Joint 1 of antennæ blackish- or reddish-brown, paler at base, slightly longer than width of vertex; 2 reddish-brown, darker at base and apex, three and one-fifth times longer than 1; 3 and 4 fuscous, 3 three-fifths the length of 2, one-third longer than 4. Beak reaching second ventral. Pronotum finely rugose with minute punctures between the rugæ. Elytra finely and densely granulate-punctate. Length 5.5—5.8 mm.

Ithaca, N. Y., June 25 (*Gerhard*). Recorded only from that State. Breeds on the red haw (*Crataegus*). "Resembles *laureæ* in coloration, but smaller; similar in size to large forms of *quercalbe* but darker colored and with more reddish." (*Knight*).

816 (—). *LYGUS SEMIVITTATUS* Knight, 1917, 626.

Elongate-oval. Head and pronotum yellowish-brown, apex of tylus and spot behind each callus fuscous; scutellum with sides darker than disk; elytra dark brown to fuscous, basal half of embolium and outer adjacent half of corium yellowish, cuneus pale yellowish; membrane fuscous, the veins and central area paler; legs greenish-yellow, hind femora brown with traces of darker rings near apex. Antennæ yellowish-brown, tinged with fuscous apically, joint 1 two-fifths as long as pronotum, 2 three and one-fourth times longer than 1, 3 nearly three-fifths as long as 2, twice the length of 4. Length 5.3—5.5 mm.

Recorded from New York and Virginia. Breeds on white oak.

817 (1021). *LYGUS VITICOLLIS* Reuter, 1876, 71.

Elongate, subparallel. Dull straw-yellow, sparsely pubescent with very fine appressed yellow hairs; pronotum with blackish stripes as in key; corium with a piceous spot on apex, this usually prolonged obliquely forward to cover apical third of embolium, cuneus pale translucent yellow; membrane in great part fuscous; legs straw-yellow, the apical half of hind femora dark brown. Antennæ dull yellow, the tip of joint 2, apical half of 3 and all of 4, fuscous; joint 1 two-thirds the length of pronotum, 2 slightly more than three times the length of 1, 3 three-fifths the length of 2, nearly twice as long as 4. Pronotum, except calli, very finely strigose. Elytra finely scabrous. Length, 5.8—6.2 mm.

Marion and Putnam counties, Ind., May 19—July 21; beaten from red haw (*Crataegus*) and maple. The recorded range extends from Ontario and New England west to Iowa, and south-west to Texas, the types being labeled from the latter State. Breeds on maple, passing the winter in the egg stage on the host plant. The nymphs are pale whitish in hue, as are also the adults when freshly emerged.

818 (—). *LYGUS ATRINOTATUS* Knight, 1917, 617.

Elongate-oval. Color as in key; scutellum pale yellowish, side margins narrowly black; clavus black with narrow percurrent yellowish



line, corium with apical half blackish, inner margin of basal half often brownish, embolium yellowish, apical third blackish, cuneus pale yellowish-translucent; membrane dark fuscous, basal half of cells, sides of veins and spot near cuneus paler; legs greenish-yellow, hind femora in part blackish; ventrals brownish-yellow, with narrow blackish line on sides. Joint 1 of antennæ yellowish-brown, two-thirds as long as pronotum; 2 black, narrowly pale at base, three times as long as 1; 3 and 4 blackish, 3 about three-fifths as long as 2, 4 two-thirds the length of 3. Beak reaching hind margins of middle coxæ. Length 4.7—5.5 mm.

Recorded from Pennsylvania, District of Columbia and North Carolina.

819 (—). *LYGUS LAUREÆ* Knight, 1917, 636.

Elongate-oval. Dull brownish- or greenish-yellow, thinly clothed with yellowish pubescence; head brownish-yellow, usually with reddish lines or dots, the vertex often with two short dark stripes; pronotum with blackish stripes as in key; elytra usually with inner half of clavus and apical third of corium blackish-fuscous, cuneus and basal two-thirds of corium and embolium greenish-yellow; membrane with base and cells fuscous, veins paler, apical half dusky with a pale spot each side; legs greenish-yellow more or less reddish at base, hind femora as in key; under surface fuscous-brown, the sides usually tinged with reddish, especially so in female. Joint 1 of antennæ brownish-yellow, its length two-thirds the width of head across eyes; 2 blackish, paler at extreme base, three times as long as 1; 3 and 4 fuscous, 3 three-fifths as long as 2, 4 three-fifths the length of 3. Disk of pronotum, except calli, finely transversely rugose with minute punctures between the rugæ; elytra finely, densely shallowly punctate. Length 5.7—6.5 mm.

Rock City, N. Y., July 4 (*Gerhard*). West Point, N. Y., June 15 (*Davis*). Black Mts. and Swannanoa, N. Car., July (*Brimley*). The known range extends from New York southwest to North Carolina. Breeds on mountain laurel, *Kalmia latifolia* L. Of it Knight says: "The eggs are doubtless deposited in the twigs of laurel during July and hatch in the following spring with the unfolding of the leaves. This most unusual and interesting species will doubtless be found breeding on laurel throughout the Appalachian region."

In addition to the eastern species of *Lygus* above treated, there is one described by Reuter which is at present unknown. A translation of his Latin description is therefore given as follows:

— (1022). *LYGUS CAROLINÆ* Reuter, 1876, 71.

"Oblong-ovate, greenish, minutely punctured above, pale pubescent; antennæ testaceous, fuscous toward apex, second segment longer than the width of the pronotum at base; scutellum with two longitudinal fuscous

stripes; hemelytra immaculate, cuneus with the base fuscous, its apex broadly black; abdomen black above; apices of the femora annulated with fuscous, apices of the tarsi black; tibiæ impunctate-testaceous; membrane marked with fuscous, veins greenish. Length, 5.3 mm."

Described from "Carolynam." Recorded from Brownsville and Galveston, Tex., by Snow (1906, 152).

•XX. *TROPIDOSTEPTES* Uhler, 1878, 404.

Elongate-oval, shining, subglabrous species having the head short, porrect, face vertical, vertex convex, its basal margin carinate; eyes small, reniform, compressed; beak reaching middle coxæ; antennæ rather stout, shorter than body; pronotum subtrapezoidal, strongly narrowed from base to apex, sides straight, their margins carinate, calli smooth, prominent, disk coarsely punctate both between and in front of them, its hind portion convex, somewhat flaring, coarsely and unevenly punctate, the hind angles and basal margin broadly rounded; scutellum equilateral, convex, coarsely rugose-punctate; elytra entire, cuneus and membrane deflexed, the fracture prominent; hind tarsi with joints 1 and 2 subequal, united equal to 3. One of the two known North American species occurs in the eastern states.

820 (1039). *TROPIDOSTEPTES CARDINALIS* Uhler, 1878, 404.

Elongate-oval, broadest across apex of commissure. Bright red fading to brick-red, sometimes to dull greenish-yellow; antennæ, tylus, legs in great part, apical half of clavus and inner half of apical third of corium, blackish; membrane fuscous; front and middle femora with a pale ring near apex; prosternum, basal half of tarsi and coxæ dull yellow; tips of tarsi and beak fuscous; ventrals in part dusky, sparsely clothed with yellow hairs. Joint 1 of antennæ stoutest, glabrous, subequal in length to width of vertex; 2 sparsely pilose, twice as long as 1; 3 and 4 very slender, pilose, united two-thirds the length of 2, 4 one-half the length of 3. Length, 5.5—6 mm.

Marion, Putnam and Crawford counties, Ind., May 10—Aug. 14; beaten from foliage of ash. Milford, Conn., June 12 (*Porter*). Ranges from New England west to Michigan and Illinois and southwest to Jacksonville, Fla. Breeds on ash. For an account of its life history see Psyche, XXIII, 1916, pp. 1—3.

XXI. *CYRTOCAPSIDEA* Reuter, 1905a, 25.

Small oval species having the head wider across eyes than apex of pronotum, its front subvertical, rather acutely pro-

duced below the eyes; vertex in male much narrower than eyes, its base not carinate; pronotum trapezoidal, its apex only one-third the width of base, disk finely, densely and evenly punctate, its hind portion strongly convex, declivent forward, collar narrow but distinct, side margins obtusely carinate, calli small, the areas in front of and between them finely punctate, hind margin broadly rounded; scutellum convex, as long as commissure, obtusely carinate at middle, distinctly punctate; elytra entire, smooth, opaque, slightly surpassing abdomen, clavus and cuneus both strongly declivent. Three neotropical species are known, one from our territory.

821 (—). *CYRTOCAPSIDEA VARIEGATA* sp. nov.

Short, oval. Head brown, both it and front half of pronotum thickly clothed with golden-yellow scale-like hairs; pronotum fuscous-brown, its sides and basal angles dull yellow; scutellum reddish-brown, its carina and apex dull yellow; clavus fuscous, paler at base and apex; corium fuscous along claval suture, outer half dull yellow; embolium fuscous, vaguely flecked with small yellowish spots; cuneus reddish-fuscous, its tip and inner margin pale yellow; membrane dusky hyaline, basal half of cells fuscous, veins and outer edges pale; legs pale yellow, femora tinged with fuscous; under surface fuscous-brown, middle of ventrals and genital paler. Joints 1 and 2 of antennæ straw-yellow, 1 slightly longer than width of vertex, 2 distinctly thicker toward apex, three and a half times longer than 1; 3 and 4 fuscous, united subequal in length to 2. Elytra and base of scutellum thinly clothed with yellow, scale-like hairs. Length, 2.4 mm.

R. P. Park, Fla., March 17; one male swept from roadside herbage. Easily known from our other species of *Capsaria* by its short oval form, very large eyes, opaque impunctate elytra and floccose yellow scales on head and front half of pronotum.

## XXII. *NEOBORUS* Distant, 1884, 276.

Oblong or oblong-oval shining species having the head immersed in thorax to eyes, its front nearly vertical; eyes very prominent, compressed, overlapping front angles of pronotum; vertex subdepressed, its base margined; antennæ shorter than body, joint 1 glabrous, but little thicker than 2; pronotum trapezoidal, its sides straight, their margins carinate, calli smooth, prominent, the area between and in front of them punctate, hind portion convex, declivent forward, coarsely punctate, hind angles obtusely rounded, basal margin subtruncate; scutellum feebly convex, sparsely irregularly punctate;

elytra entire, surpassing abdomen by two-thirds the length of membrane. Nine species and two varieties have been described from the eastern states. All breed on the foliage of ash.

KEY TO EASTERN SPECIES OF NEOBORUS.

- a. Upper surface practically glabrous.
- b. First joint of antennæ pale, rarely slightly dusky.
- c. Corium without a curved reddish or blackish line, which is widened to cover its apical fourth; membrane wholly pale or only faintly tinged with dusky.
- d. Upper surface black or piceous-black; cuneus pale, its apex darker; corium sometimes with a small pale spot at base. 822. GEMINUS.
- dd. Upper surface more or less pale; pronotum and apical third of corium usually marked with reddish; scutellum in great part or wholly pale. 823. AMGENUS.
- cc. Corium with a reddish or blackish line beginning on outer margin of radius, curving inwardly and widened to cover the apical fourth of corium; membrane with a fuscous spot at base and another at apex of its larger cell. 824. PALMERI.
- bb. First joint of antennæ brownish-black; scutellum brownish-black, its sides or basal angles pale; elytra brownish-black to piceous, the basal half or more of corium and embolium pale or yellowish. 825. GLABER.
- aa. Upper surface distinctly pubescent.
- e. Basal joint of antennæ blackish.
- f. Cuneus always pale; scutellum brownish at middle of base, or brown with median line and margins paler; elytra often in great part fusco-brownish. 826. CANADENSIS.
- ff. Cuneus reddish-brown; scutellum brownish-black each side of median line, its basal angles paler; elytra reddish-brown, sub-translucent. 827. RUFUSCULUS.
- ee. Basal joint of antennæ pale.
- g. Upper surface, including scutellum, black; cuneus pale translucent; legs pale; larger, length 6 or more mm. 828. TRICOLOR.
- gg. Upper surface more or less pale; scutellum in part yellow; smaller, not over 5.2 mm.
- h. Scutellum with entire median line black; female with embolium and outer margin of corium blackish, inner apical angle of corium pale. 829. VITTISCUTIS.
- hh. Scutellum yellow or with base blackish, never with median line black; female with embolium chiefly pale, inner apical angle of corium black. 830. PUBESCENS.

822 (1042). *NEOBORUS GEMINUS* (Say), 1832, 24; I, 344.

Elongate-oblong. Black or piceous, glabrous, shining; head reddish-brown, tylus, cheeks and some vague marks on vertex piceous-brown; pronotum and scutellum shining black, the lateral and basal margins of

the former narrowly edged with pale; elytra black or piceous-black, the outer portion of basal half of corium sometimes dull yellow; cuneus pale yellow, the extreme tip piceous; base and cells of membrane in great part dusky, apical half paler; legs, first antennal and base of second straw-yellow; under surface piceous, genital region paler. Pronotum and scutellum more coarsely, closely and evenly punctate than in *amœnus*. Elytra finely densely and evenly punctate. Length, 4.8—5.2 mm.

Posey County, Ind., June 6. Described from Indiana and recorded elsewhere only from Massachusetts, Connecticut and New York. Say mentions a large whitish-yellow spot at "tip of corium" which, unless he referred to the cuneus, is not present in my specimens.

823 (1041). *NEOBORUS AMGENUS* (Reuter), 1909, 48.

Oblong-oval. Color exceedingly variable, in the typical form greenish-yellow, glabrous, shining, with apex of tylus, cheeks, a median line on vertex, usually five lines or oblong spots on disk of pronotum, inner apical half of clavus and apical third of corium, bright reddish or blackish; cuneus and membrane a uniform pale translucent; legs pale greenish-yellow, apical third of hind femora with two reddish spots; tarsal claws and tip of beak fuscous. Antennæ greenish-yellow, the tips of joints 2 and 3, and all of 4 fuscous; joint 1 about one-third longer than width of vertex; 2 nearly two and a half times the length of 1, male, twice as long as 1, female; 3 slightly longer than 4, the two united two-thirds the length of 2. Pronotum rather sparsely, deeply and unevenly punctate.

Scutellum with but few widely scattered punctures. Clavus coarsely and rather closely punctate, corium more finely and sparsely so. Length, 4.8—5.2 mm. (Fig. 175).

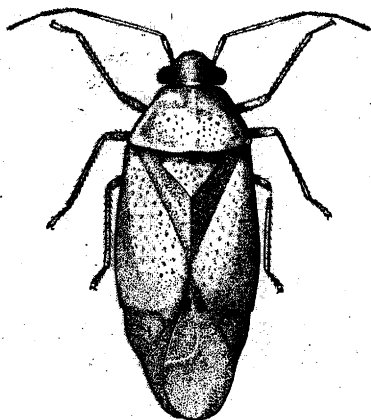


Fig. 175, X 10.  
(After Dickerson & Weiss).

Marion, Vermilion and Posey counties, Ind., May 11—Sept. 18; swept from foliage of ash sprouts in low moist alluvial grounds (*W. S. B.*). Evanston, Ill., Aug. 20 (*Gerhard*). Staten Island, N. Y., and Trenton, N. J. (*Davis*). Breeds on several species of ash throughout its range, which extends from Quebec and New England west to the Dakotas and Kansas; not recorded in the east south of Maryland. Uhler (1894, 264) states that it is very common in Maryland on the linden tree

and that it "presents all the varieties of color and marking possible to its plan of development." In New Jersey it has been recorded by Dickerson and Weiss (1916, 302) as doing much damage to four kinds of ash. They give a full account of its life history. The early records of the species were mostly under the name *Neoborus saxeus* Dist., a species described from Panama.

As above stated, the color in *amœnus* varies greatly with age, the red markings becoming blackish in older specimens. Reuter (loc. cit.) described five color varieties. These all breed on ash, and so merge into one another that the names are almost superfluous. One of them, *palmeri*, was raised to specific rank by Knight. The typical form is the one above described. Knight separates the other two found in the east as follows:

KEY TO COLOR VARIETIES OF *NEOBORUS AMCENUS*.

- a. Chiefly blackish, lateral and median vittæ on pronotal disk, scutellum except basal angles and median line at base, and corium more or less pale; membrane pale. 823a. var. *SIGNATUS*.
- aa. Chiefly black, cuneus and sometimes narrow base of corium pale; scutellum pale yellowish; membrane pale fumate, paler bordering apex of cuneus. 823b. var. *SCUTELLARIS*.

823a (1041c). *NEOBORUS AMCENUS SIGNATUS* (Reuter), 1909, 49.

Color as in key; clavus and corium blackish, tinged with reddish, the area along the claval vein and outer basal half of corium yellowish; cuneus pale translucent, dusky at tip; membrane pale fuscous, veins, spot on larger cell and margins along cuneus, paler.

Tyler, Minn., June 23 (*Minn. Univ. Coll.*). Recorded only from New York and Washington, D. C.

823b (1041d). *NEOBORUS AMCENUS SCUTELLARIS* (Reuter), 1909, 49.

Form and size of *amœnus*. Head chiefly black. Pronotum wholly black or with collar, edges and vague discal stripes pale; scutellum lemon-yellow, its base often black; basal half of corium often in part or wholly pale; apical fourth of hind femora brownish; under surface except genital plate wholly shining black.

Marion Co., Ind., May 30—June 4. Beaten from ash. Described from Kansas. Range the same as the typical form.

824 (1041a). *NEOBORUS PALMERI* Reuter in Van Duzee, 1908, 112.

More elongate than *amœnus*. Straw-yellow, strongly shining with a brownish gloss; tylus and an oblong spot below base of each antenna piceous; pronotum with a narrow marginal line each side and a broader submarginal stripe, the latter reaching from callus to base, dark brown; clavus and base of scutellum tinged with pale brown, corium with dark

stripe as in key, embolium and cuneus pale translucent; legs greenish-yellow, tips of beak and tarsi and often the sides of pleura piceous. Antennal joints 3 and 4 and apex of 2, fuscous. Length, 5.2—5.7 mm.

Marion Co., Ind., July 31; swept from coarse grasses along the side of a railway embankment (*W. S. B.*). Clarke, Lake Co., Ind., Aug. 6 (*Gerhard*). Ranges from Quebec and New England west to Michigan and Indiana. Food plants the white ash, *Fraxinus americana* L., and probably other species of ash. As in *amœnus* the markings on corium are red in young specimens, fuscous-brown in old ones. The beak apparently varies somewhat in length, in the specimens at hand reaching only to base of middle coxæ.

825 (—). *NEOBORUS GLABER* Knight, 1923, 563.

Oblong-oval. Color mainly as in key; pronotum brownish-yellow, propleura, calli and a stripe, widening behind, each side of disk extending from calli to subbasal margin, brownish-black; cuneus yellowish translucent, its apical third and inner margin fuscous; membrane uniformly fuscous, veins slightly paler; legs yellowish, middle and hind femora with two subapical brownish bands; ventrals dull yellow, a line each side of middle and genital segment brownish. Antennæ brownish-fuscous, joint 1 one-half as long as width of head across eyes, 2 three times as long as 1, 3 subequal in length to 1, one-third as long as 2, 4 three-fourths the length of 3. Beak reaching between middle coxæ. Pronotum, scutellum and elytra glabrous, shining, coarsely punctate. Length, 4.6—4.8 mm.

Marion Co., Ind., June 4—26; beaten from ash (*W. S. B.*). St. Anthony Park, Minn., June 6 (*Minn. Univ. Coll.*). Ranges from Ontario and New England west to the Dakotas; occurring from June to August on ash. The dark markings on pronotum and femora are often vague.

826 (1045). *NEOBORUS CANADENSIS* (Van Duzee), 1912a, 486.

Head, including tylus, piceous-brown with cheeks and a median line on vertex pale; pronotum with apical half fuscous, basal half brown, calli in part and median stripe pale; elytra in part or wholly dark brown, thinly clothed with inclined yellowish hairs, embolium and cuneus pale yellow, the former with outer edge, the latter with tip, blackish; membrane brown, veins paler; middle of under surface pale yellow, the sides with a broad fuscous stripe; legs yellow, the hind femora with two subapical dark rings. Joint 1 of antennæ black, one-fifth longer than width of vertex, 2 fuscous-brown, darker at base, three times the length of 1, 3 and 4 fuscous, 3 as long as 1, 4 two-thirds the length of 3. Beak reaching apex of middle coxæ. Pronotum transversely rugose with small but distinct punctures between the rugæ. Scutellum transversely strigose. Elytra finely densely and shallowly punctate. Length, 5—5.3 mm.

Hamilton Co., N. Y. (*Davis*). Recorded only from Ottawa, Ontario; New York and doubtfully from California. Occurs mainly on white ash. The elytra vary in hue from dull yellowish-testaceous to dark brown.

827 (—). *NEOBORUS RUFUSCULUS* Knight, 1923, 564.

Oblong-oval. Color mainly as in key; head dull yellow, tylus, cheeks and median line of front usually blackish; pronotum brownish-black, collar, median line on disk, spot behind outer basal angle of each callus and narrow basal margin, straw-yellow; membrane and veins brownish-fuscous; legs dull yellow, tips of middle femora, apical half of hind ones, base of tibiæ and middle of hind ones blackish; ventrals blackish, paler at middle. Antennæ fuscous, joint 1 darker, one-third longer than width of vertex, 2 three and one-fourth times the length of 1, 3 slightly longer than 1, 4 two-thirds the length of 3. Beak reaching between middle coxæ. Upper surface, except head and membrane, rather coarsely and closely punctate, clothed with suberect yellowish pubescence. Length, 4.6—4.9 mm.

Lakeland, Minn., June 14 (*Minn. Univ. Coll.*). Recorded only from New York. Breeds on white ash, *Fraxinus americana* L.

828 (1043). *NEOBORUS TRICOLOR* (Van Duzee), 1912a, 487.

Elongate-oval. Head reddish-brown or paler, tylus in great part black, its base and upper portion of cheeks piceous; pronotum, scutellum and elytra shining black, rather thickly pubescent with fine grayish inclined hairs; cuneus white; membrane wholly dark fuscous; legs pale greenish-yellow thickly hirsute with erect hairs; tip of beak and tarsal claws piceous; antennæ hirsute, dull yellow, the apical fourth of second joint dusky; ventrals reddish-brown, clouded with darker. Vertex and face broader than in *amœnus*. Pronotum longer, more narrowed in front, its disk, except calli, coarsely, deeply and evenly punctate. Scutellum and clavus transversely strigose, punctured between the strigæ; corium finely and closely punctate. Length, 6—6.5 mm.

Marion Co., Ind., June 4—26. Swept in some numbers from ash sprouts in low dense woodlands of the White River bottoms. Recorded only from New Jersey and Missouri. It is our largest species and easily known by the finely pubescent, black upper surface and pale cuneus.

829 (—). *NEOBORUS VITTISCUTIS* Knight, 1923, 566.

Oblong-oval. Color mainly as in key; head blackish, margin of cheeks and loræ paler; pronotum black, spot near middle, a vague ray behind each callus, and carinæ of side margins yellowish; elytra black, male; pale brownish-yellow with embolium, except tip, and outer margin of corium black, female; cuneus pale translucent; membrane fuscous, paler in female; legs straw-yellow, tips of tarsi only dusky; ventrals black. Antennæ dull yellow, joint 1 one-half longer than width of ver-



tex, 2 two and three-fourth times the length of 1, 3 two-fifths as long as 2, 4 three-fifths the length of 3. Beak reaching between middle coxæ. Upper surface shining, coarsely punctate, each puncture bearing a suberect pale hair. Length, 4—5 mm.

Recorded only from Virginia and Missouri.

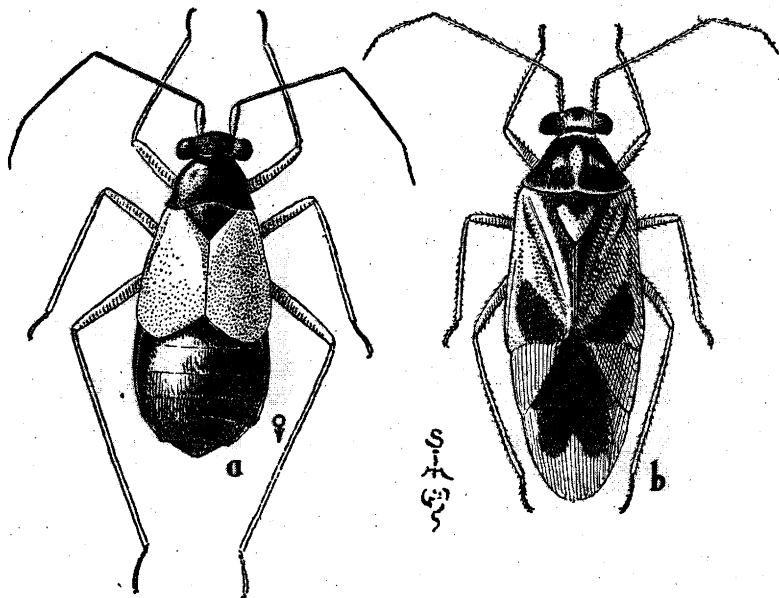


Fig. 176. a, *Mecommia gilvipes* (Stal), female X 15; b, *Neoborus pubescens* Knight X 11. (After Drake, Tech. Publ. 16, N. Y. St. Coll. For.).

830 (—). *NEOBORUS PUBESCENS* Knight, 1917a, 81.

Oblong, sides subparallel, male, more oval, female. Head reddish-brown, usually with tylus, median line and a dash each side of eyes, blackish; pronotum black, the middle of collar, a median line dilated at middle, narrow edges of side and basal margins, and often one or two vague stripes behind the calli, pale yellow; scutellum as in key; elytra with clavus and a broad bar reaching across apical third of corium, black or piceous, remainder of corium and entire cuneus pale yellow; membrane dusky, the cells and veins darker; antennæ and legs pale yellow, under surface black, usually paler on middle and genital segment. Pronotum with sides distinctly carinate only on apical half, disk except calli, rather finely, deeply and evenly punctate, both it and elytra sparsely clothed with suberect yellowish hairs. Scutellum very sparsely punctate. Length, 4.5—4.8 mm. (Fig. 176, b).

Marion Co., Ind., June 12; beaten from black ash (*W. S. B.*). Palos Park, Ill., July 4 (*Gerhard*). The known range extends from New England west to Michigan and Illinois. Hussey recorded it as common in June and July on the black ash, *Fraxinus*

*nigra* Marsh., in the dune region of southern Michigan. Knight (1923, 566) says that the food plant is "*Fraxinus americana* but found developing only on young plants in much shaded situations." This species seems to form a sort of connecting link between the genera *Neoborus* and *Xenoborus*, as only the front half of pronotum has the sides carinate.

### XXIII. XENOBORUS Reuter in Van Duzee, 1908, 112.

This genus is very close to, if not a synonym of, *Neoborus*. It differs mainly in the characters given in the generic key, p. 752, and, as stated above, the carinæ of side margins of pronotum in *Neoborus pubescens* are abbreviated, that species therefore connecting up the two genera. Four species are known, all occurring in our territory.

#### KEY TO EASTERN SPECIES OF XENOBORUS.

- a. Larger, length 6.4 or more mm.; upper surface in great part greenish-yellow, darker only along the sides of the claval commissure. 831. COMMISSURALIS.
- aa. Smaller, length not over 5.7 mm.; elytra usually in great part dark brown or blackish.
  - b. Membrane fuscous with an oval paler spot at middle; calli and a spot or stripe each side of median line of pronotum, inner half of clavus and a spot on apical third of corium, dark brown or fuscous-black; length, 5 mm. 832. FLAGIFER.
  - bb. Membrane uniformly dark fuscous or black.
    - c. Hind tibiæ wholly pale; hind femora pale or rarely dusky near apex; embolium, basal half of corium and entire cuneus pale in both sexes; length, 5.4 mm. 833. NEGLECTUS.
    - cc. Hind tibiæ fuscous, blackish near base; hind femora blackish apically or annulate with dark and pale; embolium and basal half of corium dark, rarely pale in female. 834. PETTITI.

#### 831 (1046). XENOBORUS COMMISSURALIS Reuter in Van Duzee, 1908, 112.

Pale greenish-yellow, more or less tinged with reddish-brown; front of head and calli pale brownish-yellow tinged with reddish, strongly shining, tylus black; scutellum wholly greenish-yellow; apical half of clavus dark brown to fuscous, cuneus pale yellowish translucent; membrane dusky, paler along the margins; legs pale yellow, tip of beak and tarsal claws darker; antennæ dark brown to fuscous-black, the incisures paler. Beak reaching middle coxæ. Joint 1 of antennæ about as long as head; 2 twice as long as 1, female, two and a half times longer than 1, male; 3 and 4 much more slender, 4 one-half the length of 3. Pronotum about one-fifth shorter than its basal width, calli prominent, disk behind them thickly and rather coarsely rugose-punctate. Scutellum sparsely, similarly punctate. Elytra finely and sparsely punctate, each puncture bearing a very fine suberect yellowish hair. Length, 6.4—7 mm.

Crawford Co., Ind., May 19. Its recorded range extends from Quebec and New York west to Minnesota. Food plant the black ash.

832 (1047). *XENOBORUS PLAGIFER* (Reuter), 1909, 51.

Elongate-oblong. Greenish-yellow, glabrous, shining, with dark markings as in key, tylus and some irregular marks on vertex brown; scutellum yellow, its narrow side margins, inner half of clavus, commissure, and a spot on apical third of corium, dark brown to fuscous-black; embolium and cuneus except apex, yellowish-translucent; legs greenish-yellow, the tip of beak and apical joint of tarsi blackish; under surface pale along middle, but with a broad dark stripe along the sides. Antennæ slender, joints 1 and 2 blackish, 1 about as long as width of head across eyes, 2 twice as long as 1; 3 and 4 dusky, 3 two-fifths as long as 2, 4 half the length of 3. Pronotum, except calli, coarsely, deeply, rather closely and evenly punctate, its hind angles and basal margins broadly rounded. Scutellum and clavus transversely rugose with coarse punctures between the rugæ; corium finely and sparsely punctate, the punctures without hairs. Length, 5—5.3 mm.

Carlton Co., Minn., Aug. 18 (*Minn. Univ. Coll.*). Recorded only from Ontario, New York and Minnesota. Occurs on the black ash, *Fraxinus nigra* Marsh.

833 (—). *XENOBORUS NEGLECTUS* Knight, 1917a, 82.

Elongate, sides subparallel. Head dull yellow, flecked with reddish, the lower half fuscous, vertex with basal carina and median dash blackish; antennæ fuscous, joint 1 paler at base; pronotum black, collar, a large median spot on disk and side margins pale yellow; mesoscutum blackish; scutellum pale yellow; elytra blackish with pale markings as in key; membrane fuscous, paler at middle in female; legs pale yellow, hind femora as in key. Pronotum without carinæ, punctate as in *plagifer*. Length, 5.4 mm.

Known only from New York and Michigan.

834 (1044). *XENOBORUS PETTITI* (Reuter), 1909, 50.

Oblong-oval. Color variable, usually black with scutellum, embolium, basal half of corium and cuneus more or less pale; collar and sometimes the basal edge of pronotum yellow; front of head and disk of pronotum sometimes reddish. Antennæ dark brown or black, base of joint 1 and often that of 2 yellowish; joint 1 about as long as head in front of eyes, 2 twice as long as 1, subequal in length to width of pronotum at base, male, one-sixth shorter, female; 3 two-fifths as long as 2, 4 one-half the length of 3. Pronotum with space between and in front of calli finely punctate, remainder of disk coarsely so. Scutellum unevenly transversely strigose and punctate. Elytra finely, closely and evenly punctate. Length, 5.7—6.3 mm.

New Haven, Conn., June 22—Sept. 28 (*Walden*). Ramsey Co., Minn., June 15 (*Minn. Univ. Coll.*). Described from Pennsylvania. Recorded elsewhere only from Massachusetts and New York. Occurs on white ash in June and July.

Tribe III. MYRMECORINI Kirkaldy, 1906, 372.

This tribe contains but two genera and comprises slender-bodied, dull colored Mirids of medium size possessing the characters given under *aa* in the Key to Tribes of Capsinæ, p. 681, and having the head porrect its front strongly vertical, vertex with a groove or median impression; antennæ slender, as long as or longer than body; beak reaching or surpassing hind coxæ; pronotum subcampanulate, its posterior portion strongly convex, more or less flaring; elytra long and slender, distinctly constricted near middle.

KEY TO EASTERN GENERA OF MYRMECORINI.

- a.* Joint 1 of antennæ nearly one-half longer than greatest width of head; scutellum not conically produced; upper surface with fine, short pubescence. I. PARAXENETUS, p. 794.
- aa.* Joint 1 of antennæ but little longer than width of vertex; scutellum conically produced upward; upper surface, especially the pronotum and scutellum, with long erect hairs. II. BARBERIELLA, p. 795.

I. PARAXENETUS Reuter, 1907, 46.

Elongate, slender, subcylindrical species having the head short, broad, slightly exserted, but little prodded in front of eyes, its front vertical; eyes very large, longer than wide; antennæ one-third longer than body, very slender, not tapering; beak reaching first ventral; pronotum subcampanulate, its front portion subcylindrical, without lateral carinæ, hind lobe strongly convex; elytra entire, surpassing abdomen, constricted at middle; legs long and slender, joints 1 and 3 of hind tarsi subequal, 2 shorter. One species is known.

835 (919). PARAXENETUS GUTTULATUS (Uhler), 1887c, 150.

Elongate, subcylindrical. Pale brown, when fresh usually more or less tinged with reddish; basal half of pronotum, scutellum and apical third of corium often fuscous-brown, cuneus with a small vague yellow spot at base; joints 1—3 of antennæ, tibiæ, tip of scutellum, a dot on corium near tip of commissure, hind coxæ and ventrals 1 and 2, pale straw-yellow; membrane pale at base, fuscous toward apex; femora pale reddish-brown, their apical halves more or less tinged with fuscous, the hind ones with apical third vaguely annulate with yellow; ventrals 3—6 fuscous. Joint 1 of antennæ as long as head and pronotum united, 2 nearly two and a half times longer than 1, 3 four-fifths the

length of 2, 4 dark reddish-brown, three-tenths the length of 3. Front lobe of pronotum with a small median impression. Scutellum convex, longer than broad, strongly tapering behind. Elytra with short, very sparse prostrate yellow hairs, a faint yellow spot near middle. Hind femora rather stout, subfusiform, feebly curved. Length to tip of membrane, 6—7 mm. (Fig. 177).

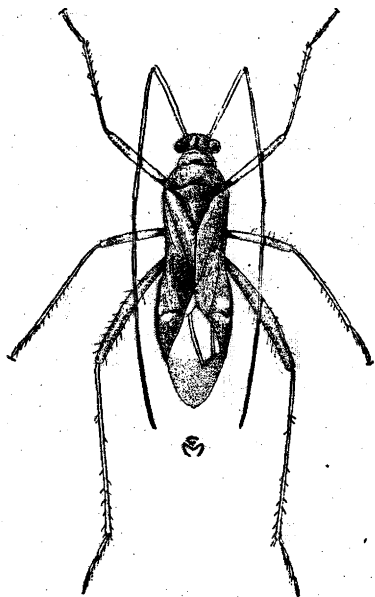


Fig. 177, X 6. (Original).

Warren, Vermilion and Marion counties, Ind., July 21—Sept. 1. Only a few specimens were taken at each station, usually by sweeping nettles and other herbage in low moist grounds. Ranges from New York west to Illinois and southwest to Texas. Uhler says that in Maryland it occurs on *Liriodendron* and grape vines. Banks (1907, 425) found it quite abundant in August at Falls Church, Va., on the foliage of tulip trees. "They were difficult to recognize at rest, and when disturbed were very active and difficult of capture."

## II. BARBERIELLA Poppius, 1914a, 255.

Slender bodied ant-like species having the head wider than apex of pronotum, its front vertical, vertex impressed, not grooved; beak reaching upon hind coxæ; pronotum with front lobe subcylindrical, hind one strongly convex, flaring basally; mesoscutum broadly exposed; disk of scutellum convex, conical, the apex of cone bent backward; elytra strongly constricted at middle, disk nearly flat; hind tibiæ compressed, strongly curved. One species occurs in our territory, another in Texas.

836 (—). *BARBERIELLA APICALIS* Knight, 1923, 657.

Head and pronotum brownish-black, clothed with pale pubescence and sparse suberect hairs; scutellum dark brown; clavus and base of corium fuscous-brown; middle of corium with a transverse pale spot followed by a shining fuscous or brown cross-bar, the apex pale brown; cuneus brownish-translucent, strongly deflexed; membrane fuscous-brown, veins slightly darker; legs dark brown, femora alutaceous, tibiæ beset with yellow setæ; ventrals blackish-brown, a pale spot on middle

of sides. Antennæ dark brown, joint 1 one-fifth longer than width of vertex; 2 cylindrical, four times as long as 1; 3 more slender, one-half the length of 2; 4 three-fifths the length of 3. Length, 5—5.5 mm.

Recorded only from Staten and Long Islands N. Y., where it was taken by Davis in July and August.

Subfamily III. ORTHOTYLINÆ Van Duzee, 1916a, 203.

This subfamily comprises Mirids of very diverse form, size and appearance, but all agreeing in having the arolia between the tarsal claws distinct, erect, with tips converging (pl. X, figs. 33—54), and pronotum without a distinct collar. The membrane is glabrous, usually with two distinct cells; cell of inner wings without a hamus; tibiæ narrowed toward apex, usually distinctly spinose; third tarsal joint longer than either of the others. For convenience of study the subfamily is divided into eight tribes.

KEY TO TRIBES OF SUBFAMILY ORTHOTYLINÆ.

- a. Eyes pedunculate; head very broad. I. LABOPINI, p. 797.
- aa. Eyes not pedunculate; head not unusually broad.
- b. Flanks of pronotum separated from the disk by a distinct suture; hind portion of pronotal disk elevated or on a higher plane than and projected above the base of scutellum; upper surface thickly clothed with erect bristly pubescence. II. SEMIINI, p. 798.
- bb. Flanks of pronotum not separated from disk by a suture; base of pronotal disk not projecting above the scutellum.
- c. Body robust, short oval or ovate, often brachypterous; hind femora thickened, saltatorial; head strongly vertical, the vertex, viewed from above, wider than length of head. III. HALTICINI, p. 799.
- cc. Body more elongate; hind femora normal; length of head (except in *Pilophorini*) usually greater than width of vertex.
- d. Slender ant-like species with broad head; form usually elongate with body constricted at middle; pronotum with sides sulco-sinuate, the apical half of disk narrowed; elytra usually with narrow cross-bars of silvery deciduous scale-like hairs. IV. PILOPHORINI, p. 806.
- dd. Form not ant-like; sides of pronotum not sulco-sinuate; elytra devoid of silvery markings.
- e. Joint 3 of antennæ as thick as joint 2, or nearly so; females often brachypterous.
- f. Pronotum not distinctly campanulate, its apex wider than vertex; elytra not coarctate at middle; abdomen broad at base. V. CERATOCAPSINI, p. 819.
- ff. Pronotum campanulate, its apex scarcely wider than vertex; form slender with elytra coarctate at middle; abdomen narrowed at base. VI. SYSTELLONOTINI, p. 830.
- ee. Joint 3 of antennæ distinctly more slender than joint 2.

- g.* Sides of pronotum distinctly carinate; front margin of pronotum usually elevated in a collar-like ridge by a transverse depression before the calli; width of vertex greater than length of head; front of head strongly produced vertically; body opaque or nearly so. VII. LOPIDINI, p. 831.
- gg.* Sides of pronotum not carinate, or if so, the front margin of pronotum not elevated; head usually as long as or longer than width of vertex, its front less vertical; body more or less shining. VIII. ORTHOTYLINI, p. 844.

Tribe I. LABOPINI Reuter, 1883, 567 (*Laboparia*).

This tribe contains only a single genus which is easily distinguished by the wide head and pedunculate eyes.

# I. LABOPS Burmeister, 1835, 279.

Oblong-oval hirsute species having the head across eyes wider than base of pronotum; front vertical; eyes projecting outward far beyond front angles of pronotum; beak reaching between hind coxæ; antennæ two-thirds the length of body, hirsute, joints 3 and 4 more slender than the others; pronotum trapezoidal, wider at base than long, base one-third wider than apex, sides straight, disk feebly declivent, calli present but low; scutellum triangular, equilateral; elytra dimorphic, in macropterous forms surpassing abdomen with membrane well developed; in brachypterous ones reaching sixth dorsal, with disk convex and tips broadly separately rounded, membrane absent, clavus and cuneus scarcely differentiated. Two species occur in our territory.

## KEY TO EASTERN SPECIES OF LABOPS.

- a.* Cheeks of male strongly convex, concealing base of tylus when viewed from the side; front of vertex of female strongly declivent. 837. HESPERIUS.
- aa.* Cheeks of male less convex, base of tylus visible as viewed from the side; vertex nearly horizontal in both sexes. 838. BURMEISTERI.

837 (1117). LABOPS HESPERIUS Uhler, 1872, 416.

Oblong, sides subparallel, male, suboval, female. Upper surface thickly clothed with long inclined yellowish hairs, intermixed with appressed scale-like pubescence. Head black, shining; loræ, cheeks, median longitudinal line on vertex and a triangular spot at inner basal angle of each eye extending along base of vertex, yellowish-white; pronotum and elytra black, opaque, the latter with embolium and sometimes the outer third of corium pale yellow; membrane fuscous, veins black; legs fuscous-black, the middle of hind tibiæ, tips of all femora and some spots on their under surface dull yellow; under surface shining black, thickly

clothed with suberect yellowish hairs. Joint 1 of antennæ subequal in length to two-thirds the width of vertex; 2 more slender than and two and two-third times longer than 1; 3 two-fifths the length of 2, 4 slightly longer than 3. Pronotum except calli, scutellum and elytra all transversely rugose. Length, 4.3—4.6 mm.

Wilmington and Whiteface Mountain, N. Y., July (*Davis*). Paris, Me., June 10 (*Frost*). Georgetown, Colo., July 28 (*Gerhard*). A species of northern distribution ranging from Quebec and New England west to the Pacific. Described from Colorado and Montana. Recorded also from New Mexico. But little regarding its habits has been published, though it seems to inhabit, for the most part, mountainous regions. Drake (1923, 77) mentions it as occurring on grasses and weeds about Cranberry Lake, N. Y. In the macropterous forms from Maine and New York the hairs of hind tibiæ are fewer and shorter than the spines, while in the Colorado specimens at hand they are about as long as the spines, and the middle of hind and middle tibiæ are vaguely dull yellow. In these characters those from Colorado appear to be intermediate in form between Knight's *L. hirtus* (1922a, 258) and Uhler's species. Van Duzee states<sup>83</sup> that one specimen in his material "has the tibiæ altogether black with the long tibial hairs and male claspers of *hirtus*, so the color of the tibiæ cannot be relied upon in separating these forms." As the description of *hirtus* agrees otherwise in every particular with that of *hesperius*, I regard Knight's name as a synonym.

838 (1118). LABOPS BURMEISTERI Stal, 1858, 189.

"Oval. Blackish, opaque, clothed with silken yellow pubescence; head with a transverse basal line, curved forward on both sides and interrupted at middle, a spot beneath the eyes, cheeks, narrow pectoral margins adjoining coxæ, and a wide annulus on middle of tibiæ, sordid yellow. Membrane wanting. Female, length 4.3 mm.; width 2 mm." (*Stal*).

The above is a free translation of the brief original description. It is a palæarctic species, described from Kamchatka and recorded in this country from the Adirondack region, New York, Sudbury and the Abitibi region, Ontario, and Alaska.

Tribe II. SEMIINI Knight, 1923, 497.

This tribe also contains but a single genus which is easily separated from others of the subfamily by the presence of a

<sup>83</sup>Pan Pacific Entomologist, II, 1926, 163.



suture separating the propleura or flanks of pronotum from the disk.

I. SEMIUM Reuter, 1876, 80.

Small oblong opaque species having the head short, broad, inserted in thorax to eyes, its front subvertical; beak reaching middle coxæ; pronotum strongly narrowed and declivent from base to apex, base more than twice the width of apex, front portion of disk with two transverse impressions, hind portion strongly convex; elytra entire, surpassing tip of abdomen; second joint of hind tarsi nearly twice the length of first. One species is known.

839 (1186). SEMIUM HIRTUM Reuter, 1876, 80.

Oblong, subcuneiform. General color velvety-brown; head, joints 1 and 2 of antennæ, and legs except tarsi, strongly tinged with reddish; apical fourth and flanks of pronotum reddish-yellow; scutellum, embolium, corium except apex and cuneus except tip, yellowish-white; membrane fuscous-brown; tarsi and joints 3 and 4 of antennæ dusky brown. Joint 1 of antennæ very short and stout, its length scarcely half the width of vertex; 2 almost as stout and five times as long as 1; 3 and 4 much more slender, 3 subequal in length to 2, nearly three times longer than 4. Length, 2.8—3.4 mm.

Marion Co., Ind., Sept. 12—Oct. 6, swept from *Euphorbia* along roadsides and railway embankments. Ranges from New York west to Iowa. Described from Texas and recorded from California. Occurs on the reddish under surface of the leaves of spurge (*Euphorbia*).

Tribe III. HALTICINI Kirkaldy, 1906, 130.

Small oval robust species having the head broad, its hind margin usually sharp, concentric with or overlapping the front margin of pronotum; antennæ slender, often as long or longer than body; beak reaching to or beyond middle coxæ; pronotum trapezoidal, sides straight, not carinate, calli distinct in the winged forms; scutellum triangular; mesoscutum usually concealed; elytra often dimorphic, the brachypterous form with cuneus and membrane frequently wanting. Other characters as in tribal key.

Knight (1923, 498) assigns four of our eastern genera to the tribe, two of which Van Duzee classed under the tribe *Orthotylini*. Some of the species are widely distributed and at times very injurious.

## KEY TO EASTERN GENERA OF HALTICINI.

- a. Head with a well defined sharp basal margin; color black.
- b. Antennæ as long as or longer than body, joint 2 four or more times longer than 1; hind femora greatly flattened, saltatorial; brachypterous females oval and strongly convex; length less than 3.7 mm. I. *HALTICUS*, p. 800.
- bb. Antennæ shorter, scarcely as long as elytra, joint 2 but little more than three times the length of 1; hind femora not greatly flattened; length more than 4 mm.
- c. Antennæ with short fine pubescence; head and body nearly glabrous, shining black; length more than 4 mm. II. *STRONGYLOCORIS*, p. 803.
- cc. Antennæ and head with long coarse black hairs, length of hairs on third antennal three times the thickness of segment; macropterous form with upper surface in part pale. III. *ORTHOCEPHALUS*, p. 804.
- aa. Head without a sharp basal margin; upper surface clothed with appressed scale-like deciduous hairs intermixed with longer, more erect ones; color variable, but never black. IV. *PARTHENICUS*, p. 804.

I. *HALTICUS* Hahn, 1831, 113.

Short oval species having the head long, pointed, its front vertical; antennæ often longer than body, joint 1 cylindrical, shorter than head, 2 linear, four or more times longer than 1, 3 and 4 filiform, united longer than 2; macropterous forms with pronotum trapezoidal, nearly twice as wide at base as long; elytra, oval, convex, surpassing abdomen, widest behind middle, the divisions all present; brachypterous forms with pronotum subquadrate, but little wider than long; elytra shorter than abdomen, strongly convex, corium alone present; hind femora long, stout, somewhat curved, the inner side flattened. Other characters as in key and under tribal heading. Three species occur in the eastern United States.

KEY TO EASTERN SPECIES OF *HALTICUS*.

- a. Body wholly devoid of deciduous scale-like pubescence; antennæ pale, joints 3 and 4 slightly dusky; length, 2.7 mm. 840. *APTERUS*.
- aa. Body above with patches of deciduous scale-like pubescence:
  - b. Smaller, length not more than 2 mm.; joint 2 of antennæ yellowish at middle, blackish at tip and base. 841. *BRACTATUS*.
  - bb. Larger, length 2.5 or more mm.; joint 2 of antennæ pale, sometimes fuscous at tip. 842. *INTERMEDIUS*.

840 (1119). *HALTICUS APTERUS* (Linnæus), 1758, 438.

Oblong-oval, robust, convex. Black, shining, clothed with fine, short inclined hairs; femora black, their tips pale, tibiæ and joints 1 and 2 of

tarsi yellow, third tarsal and claws black; ventrals black with fine short grayish hairs. Pronotum minutely punctate, its basal half and disk of scutellum transversely wrinkled, calli subobsolete. Elytra, brachypterous form, obovate, reaching fourth dorsal, tips broadly rounded, disk shallowly and coarsely punctate. Length, 2.5—3 mm.

Shalford and Hurst Green, England (*British Mus. Coll.*). An introduced European species, recorded by Van Duzee as ranging in this country from New England west to Colorado and south to Maryland, but, according to Knight, correctly identified only from Maine and Canada. Macropterous forms are very scarce.

841 (1121). *HALTICUS BRACTATUS* (Say), 1832, 26; I, 348.

*Males*—Usually macropterous; oblong-oval, sides subparallel. Black, strongly shining, very thinly clothed with silvery gray hairs which, on the elytra are usually condensed into small spots; cuneus blackish translucent, its apex pale; membrane pale dusky translucent throughout; under surface and femora in great part black, front and middle femora with tips broadly pale, hind ones more narrowly so; tibiæ and tarsi yellowish, tarsal claws and basal third of hind tibiæ blackish. Joint 1 of

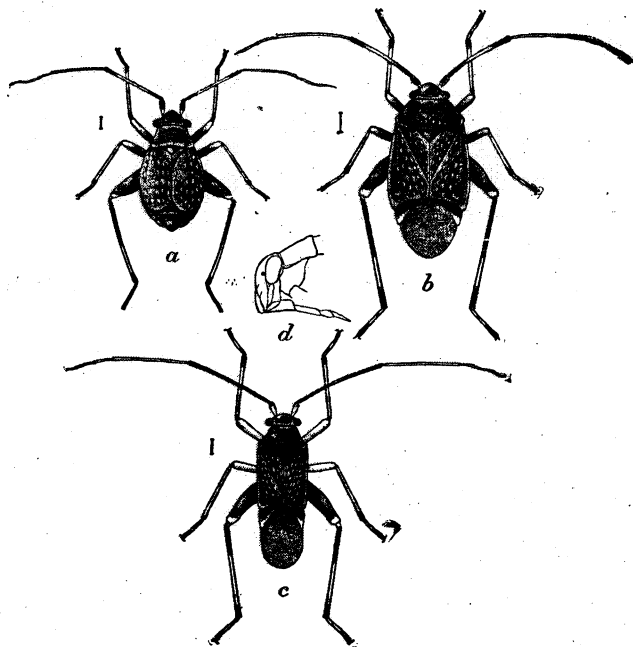


Fig. 178. a, Brachypterous female, X 10; b, full winged female, X 12; c, male, X 11; d, head of male in outline. (After Chittenden, U. S. Div. Ent.).

antennæ blackish, paler at base, three-fourths as long as width of vertex; 2 as in key, about four times longer than 1; 3 fuscous, the base yellowish, two-thirds the length of 2; 4 fuscous, one-half as long as 3. Head smooth, polished, vertex with a small round median impression. Surface of pronotum and elytra somewhat roughened, minutely granulate; membrane surpassing abdomen by three-fourths or more its length. Length, 1.8—2 mm. *Females*—Usually brachypterous and oval, broader and much more convex; color the same; pronotum shorter, subquadrate, much less declivent; elytra usually with coria alone present, reaching sixth dorsal, their tips separately broadly rounded. Length, 1.3—1.5 mm. (Fig. 178).

Frequent throughout Indiana, June 11—Oct. 16. Dunedin, R. P. Park and Sanford, Fla., Nov. 21—April 4. Occurs on foliage of many plants, both wild and cultivated, especially those growing in rich moist soil. Once taken by scores near Dunedin on turnip tops, and frequently swept from ferns in dense hammocks. Ranges from Ontario and New England west to Kansas and Utah and southwest to Florida. In later years, for some unknown reason, this species has been listed as *Halticus citri* (Ashm.) (1887, 155), but a careful study of the original descriptions of both authors leads me to believe Ashmead's name is an absolute synonym. Both descriptions were founded on the macropterous form and, as far as they go, agree in every particular. The males appear to be much more scarce than the females, and macropterous forms of the latter sex are very scarce. Webster (1897, 209) named 20 plants on which *H. bractatus* was found feeding. He stated that: "The insect feeds during all its development on the upper surface of the leaves, notably those of red clover, discoloring the entire leaf. They do not become abundant until early summer, and continue so until October, when they gradually disappear." Many of the older records were made under the name of *Halticus uhleri* Giard, also a synonym.

842 (1120). *HALTICUS INTERMEDIUS* Uhler, 1904, 360.

Broadly ovate, moderately convex. Black, strongly shining; membrane pale fuscous, cells darker; femora black, knees, tibiæ and tarsi pale. Antennæ very slender, reaching tip of cuneus, joint 1 dull yellow, darker at middle, two-thirds as long as width of vertex; 2 about twice as long as pronotum; 3 and 4 more slender, dusky yellow, united nearly as long as 2. Pronotum narrowed in front, side margins feebly reflexed, calli subobsolete. Elytra with costal margins strongly curved, disk inflated and with small patches of deciduous silvery or greenish scale-like hairs. Length, 2.5—3.5 mm.

Honesdale, Pa., Sept. 10 (*Olsen*). Described from Arizona. Recorded from New England, Pennsylvania and Michigan.

## II. STRONGYLOCORIS Blanchard, 1840, 140.

Elongate-oval, glabrous, shining species having the vertex flattened, minutely punctate; pronotum about twice as wide at base as long, its posterior portion convex, not strongly declivent, hind angles obtusely rounded; scutellum triangular, subtectiform, finely strigose; elytra entire, surpassing abdomen, clavus with sides strongly declivent, cuneus and membrane also declivent, the fracture weak. Two of the five recognized North American species occur in our territory.

### KEY TO EASTERN SPECIES OF STRONGYLOCORIS.

- a. Second antennal of female a fifth longer than width of head across eyes; legs in part pale. 843. STYGICUS.
- aa. Second antennal of female not longer than width of head across eyes; legs, except tips of femora and base of tarsi, dark brown to black. 844. ATRATUS.

843 (1123). *STRONGYLOCORIS STYGICUS* (Say), 1832, 24; I, 344.

Elongate- or oblong-oval. Black, moderately shining; cuneus piceous, membrane dark brown; tibiæ, tips of femora, joints 1 and 2 of tarsi and basal half of trochanters dull yellow. Joint 1 of antennæ dull yellow, its length less than half the width of vertex, its basal fifth black, female, wholly black, male; 2 with extreme apex and base blackish, middle dull yellow, female, wholly fuscous, male; 3 and 4 fuscous, paler at base, 3 three-fifths the length of 2, twice as long as 4. Pronotum and elytra densely minutely rugose-punctate, calli prominent, almost smooth. "Dextral male clasper with median angle produced in a long tooth, thus forming a semicircle with the incurved angle of the fan-shaped apex." (*Van D.*). Length, 4.3—5 mm.

Frequent throughout Indiana, May 24—Sept. 15. Occurs on the great ragweed, *Ambrosia trifida* L., and Virginia creeper, in alluvial soil along streams and on grasses and low herbage in dense woodland. Ashland, Mass., May 2 (*Frost*). Ranges from Quebec and New England west to the Pacific and southwest to North Carolina and New Mexico. Breeds on goldenrod and probably on wild sunflower and other Compositæ.

844 (1124). *STRONGYLOCORIS ATRATUS* (Uhler), 1894, 268.

Form and size of *stygicus*. Black, more strongly shining; membrane dark fuscous-brown, the edge near tip of cuneus slightly paler; antennæ black or blackish-brown, the incisures alone paler; legs black, tibiæ dark brown, knees, tips of coxæ and basal joint of tarsi tinged with yellow. "Dextral male clasper with median angle obtuse or produced in a short

tooth, thus forming a shorter arc with the fan-shaped apex; the latter quadrifid, usually forming four acute teeth, the dorsal much the longer." (*Van D.*). Length, 4.7—5 mm.

Marshall, Starke, Marion, Putnam and Perry counties, Ind., May 16—July 5. Occurs on herbage along the banks of woodland streams. Described from California. Recorded from New Jersey, and by Van Duzee (1921a, 135) from Ottawa and Montreal, Canada, New Hampshire, New York and Colorado.

### III. ORTHOCEPHALUS Fieber, 1858, 316.

Small, thickly pilose species having the head short, wider in female than in male, its front vertical; beak reaching middle coxæ; pronotum short, trapezoidal, nearly twice as wide at base as long, hind angles rounded; scutellum triangular, equilateral, with a transverse depression near base; elytra dimorphic, in male longer than abdomen with divisions distinct; in female very convex, shorter than abdomen, gradually widened from base to the rounded tips, without cuneus or membrane. One introduced European species occurs in the eastern states.

845 (—). ORTHOCEPHALUS MUTABILIS (Fallen), 1807, 98.

Elongate, subparallel, male, suboval, female. Black, thickly clothed with long suberect black hairs and short, yellowish scale-like pubescence. Macropterous form with corium piceous, its inner half and outer margin of clavus pale hyaline; membrane fuscous, paler at middle in and around the edges of cells. Brachypterous form with elytra wholly black. Antennæ black, almost as long as body, joint 1 subclavate, slightly shorter than width of vertex; 2 three and a half times longer than 1, its apical half somewhat thickened; 3 and 4 filiform, 3 two-thirds the length of 2, 4 two-fifths as long as 3. Length, 4—4.8 mm.

Burnham Beeches and Hurst Green, England, June 22—August (*British Mus. Coll.*). Definitely recorded in this country only from Orono, Me., and Ithaca, N. Y. At Ithaca it occurred in numbers in June on the ox-eye daisy, *Chrysanthemum leucanthemum* L., the great majority of the females being brachypterous.

### IV. PARTHENICUS Reuter, 1876, 84.

Small, elongate, subparallel, pubescent, subopaque species having the head slightly wider across eyes than apex of pronotum, its front declivent; base of vertex not margined; eyes oblong, coarsely granulated; beak reaching onto ventrals; antennæ about two-thirds the length of body, joint 1 slightly

passing tip of tylus, 2 four times as long as 1, 3 and 4 united slightly longer than 2, 4 half the length of 3; pronotum twice as wide at base as long, apex about two-thirds as wide as base, calli scarcely evident; elytra usually entire with sides subparallel, surpassing abdomen; females sometimes brachypterous, with body oval and elytra shorter than abdomen; hind femora thickened, saltatorial. Three of the ten known North American species occur in the eastern states.

KEY TO EASTERN SPECIES OF *PARTHENICUS*.

- a. Upper surface thickly flecked with small dots.
- b. Dots of upper surface brick-red; cuneus in great part reddish; membrane fuscous. 846. *PSALLIODES*.
- bb. Dots of upper surface brown or fuscous; cuneus not reddish; membrane mostly white. 847. *VACCINI*.
- aa. Upper surface without distinct dots; cuneus and corium tinged with reddish. 848. *JUNIPERI*.

846 (1198). *PARTHENICUS PSALLIODES* Reuter, 1876, 85.

Pale brownish-yellow thinly clothed with fine yellowish hairs; entire upper and lower surface thickly dotted with dull red, the dots aggregated on cuneus to cover most of its surface; membrane pale fuscous-hyaline, iridescent, veins reddish; legs greenish-yellow, dotted with red; apical half of hind femora fuscous with two reddish rings; tibial spines yellowish with red dots at base. Antennæ pale yellow, joint 1 and apex of 2 marked with reddish. Length, 2.8—3.3 mm.

Dunedin, Fla., Nov. 23—Dec. 6. Two macropterous specimens swept from huckleberry, another from beneath a chunk on margin of pond. Described from Texas; recorded elsewhere only from California.

847 (1199). *PARTHENICUS VACCINI* (Van Duzee), 1915, 117.

*Macropterous form*—Elongate, subparallel. Greenish-white, head, calli and scutellum tinged with brownish-yellow; pronotum, scutellum and elytra dotted with fuscous, the dots condensed on apical fourth of corium and near tip of cuneus; commissure with a brown line behind tip of clavus; membrane translucent white, veins pale brown, four brown spots on margin; femora straw-yellow, their apical half with brown spots, those on hind femora sometimes merging; under surface pale brownish-yellow, more or less tinged with fuscous. Antennæ straw-yellow, joint 1 whitish with a black dot on inner face, but slightly surpassing tylus; 2 with a few vague brown dots, slightly longer than 3, 4 subequal in length to 1. Head prolonged in front of eyes a distance equal to width of an eye. Elytra nearly twice the length of abdomen. Length, 2.7—3.5 mm. *Brachypterous form*—Oval; membrane abbreviated, scarcely reaching tip of abdomen. Length, 1.6 mm.

Dunedin, Fla., April 6; one brachypterous female swept from tall grasses near the margin of a pond; compared with allotype.

Ipswich, Mass., July 22 (*Van Duzee*). Recorded heretofore only from Massachusetts and Long Island, N. Y., where it occurs in July on cranberry, *Vaccinium macrocarpon* Ait. The white, scale-like pubescence, notable in fresh specimens, is easily eroded, leaving the surface polished.

848 (1214). *PARTHENICUS JUNIPERI* (Heidemann), 1905a, 49.

Elongate, sides subparallel. Pale green fading to greenish-yellow; above thickly clothed with short, suberect golden-yellow hairs, intermixed with longer brownish ones, these easily abraded; the dark ones often combined to form a small dark spot near basal angles of scutellum, and others on inner edge of cuneus at middle and base; head, apical third of corium, cuneus in great part and under surface of hind femora more or less tinged with reddish; scutellum and often the base of clavus pale fuscous; membrane dusky translucent, somewhat iridescent, the veins white; legs greenish-yellow; under surface of body and upper side of hind femora usually pale dusky brown. Head shorter and more nearly vertical than in *vaccini*. Length, 2.7—3 mm.

Putnam Co., Ind., July 4—Oct. 1. Dunedin, Fla., Feb. 14—April 1; recorded also from Crescent City, that State. Beaten in numbers in autumn from its host plant, the red cedar, *Juniperus virginiana* L. One Dunedin specimen was taken in February from beneath a log. The known range extends from Ontario and New England west to Indiana, and southwest to Florida, its distribution being probably much more extensive than the records show.

#### Tribe IV. PILOPHORINI Kirkaldy, 1906, 132.

To this tribe, as characterized in the key, p. 796, belong four of our eastern genera of the subfamily.

#### KEY TO EASTERN GENERA OF TRIBE PILOPHORINI.

- a. Basal half of vertex compressed to a thin edge, which slightly overlaps the apex of pronotum; first antennal not longer than width of vertex; hind tibiæ of males usually compressed.
- b. Joint 2 of antennæ thickened toward apex; width of head less than width of pronotum at base.
- c. Elytra constricted or coarctate at middle and bearing white pubescent bands. I. *PILOPHORUS*, p. 807.
- cc. Elytra with sides subparallel and without white pubescent bands or cross-bars. II. *ALEPIDIELLA*, p. 817.
- bb. Joint 2 of antennæ scarcely thickened toward apex; width of head across eyes greater than width of pronotum at base; elytra with sides parallel and usually without white pubescent bands. III. *ALEPIDIA*, p. 817.
- aa. Base of vertex not compressed; length of first antennal subequal to



width of head across eyes; hind tibiæ cylindrical; front half of pronotum subcylindrical, its sides subparallel.

IV. PSEUDOXENETUS, p. 818.

### I. PILOPHORUS Hahn, 1826, 23.

Elongate, subcylindrical, sparsely pubescent species having the head broadly triangular, declivent, compressed behind, tylus depressed and fused with the front, beak reaching or slightly surpassing middle coxæ; antennæ stout, about half the length of body, the joints variable as to species; pronotum subcampanulate, apex narrower than head across eyes, basal half convex, sides sinuate, often with a broad vague constriction at middle, calli obsolete; elytra entire, slightly surpassing abdomen, their sides broadly concave along the middle third; corium usually with a short bar composed of silvery-gray scales across basal third which reaches only to claval suture and a second bar of similar scales at apical third which is either entire or slightly interrupted on the commissure; clavus convex, strongly deflexed to corium, cuneus and membrane deflexed; hind legs with femora thickened, tibiæ more or less curved, tarsi with joint 3 longest, 2 slightly shorter than 1. Of the genus Uhler (1887a, 29) wrote:

"The genus *Philophorus* has such a different facies from our other known Capsidæ that it would seem to be recognizable at once by the shape and adjustment of the head alone. It is very broad and curves back beyond the sides of the swollen pronotum, sits close against it, is of a conical form, scooped out behind and below; there is a high carina connecting the eyes, and the face is very sloping anteriorly. The ant-like form of the body, especially in the nymph, together with its habit of rapidly coursing over the bark of trees, renders it liable to be mistaken for one of the small red or brown Formicidæ."

Nineteen nominal species of the genus occur in the eastern states.<sup>84</sup> For convenience of treatment they are divided into three groups.

#### KEY TO GROUPS OF EASTERN SPECIES OF PILOPHORUS.

- a. Elytra polished over the entire area behind the posterior silvery crossbar.
  - b. Scutellum nearly flat or only moderately convex. Group I, p. 808.
  - bb. Middle of scutellum strongly convex, almost conically produced upward. Group II, p. 813.
- aa. Elytra polished behind the posterior silvery cross-bar, but only on the outer area between the radial vein and margin. Group III, p. 815.

<sup>84</sup>The *P. schwarzi* Reut. (1909, 74) was described from California and, according to Knight (Ms.), all eastern records are based on wrong identifications.

## GROUP I.—PILOPHORUS.

## KEY TO EASTERN SPECIES OF GROUP I, PILOPHORUS.

- a. Corium with only one cross-bar of silvery scales present, this the usual posterior one; clavus with a wedge-shaped spot of bluish bloom on outer basal third; basal half of corium less than half the width of apical third; length, 6 mm. 849. BRIMLEYI.
- aa. Corium with two cross-bars of silvery-gray scales, one subbasal, the other at apical third.
  - b. Elytra beset with numerous suberect short black bristle-like hairs, these best visible from the side.
  - c. Larger, length 5 or more mm.
  - d. Joint 3 of antennæ black or brown, nearly as thick as joint 1. 850. VANDUZEI.
  - dd. Joint 3 of antennæ pale, the apical half fuscous, slender, scarcely thicker than joint 4. 851. UHLERI.
  - cc. Smaller, length 3 mm. 852. BUENOI.
  - bb. Elytra clothed only with fine recumbent pubescence, this sometimes black, but not suberect and bristle-like.
  - e. Elytra yellowish-brown to dark brown, except behind posterior silvery line.
    - f. Joint 3 of antennæ pale, scarcely infuscated at apex; hind tibiæ strongly compressed, almost carinate.
    - g. Second antennal nearly four times as long as width of vertex; length of body, 5—5.2 mm. 853. STROBICOLA.
    - gg. Second antennal three times as long as width of vertex; length of body 3.8—4.2 mm. 854. PICEICOLA.
    - ff. Joint 3 of antennæ reddish-brown to piceous; hind tibiæ only slightly compressed. 855. CINNAMOPTERUS.
  - ee. Elytra bright cinnamon fulvous, except behind the posterior silvery line.
    - h. Larger, length 4.5 or more mm.; posterior silvery line not interrupted on corium but slightly projected forward on commissure; joint 2 of antennæ gradually thickened toward apex. 856. AMENUS.
    - hh. Smaller, length not more than 3.7 mm.; posterior silvery line interrupted on corium but not broken at claval suture.
      - i. Second antennal with apical third abruptly strongly clavate, its length greater than distance between tip of tylus and hind margin of pronotum. 857. LÆTUS.
      - ii. Second antennal gradually thickened from middle toward apex, its length not equal to distance between tip of tylus and base of pronotum. 858. JUNIPERI.

849 (—). PILOPHORUS BRIMLEYI Blatchley, 1926, 165.

Head, pronotum and scutellum dark blackish-brown, shining; clavus with inner basal third and apical half velvety-black, outer basal third with an inverse wedge-shaped spot covered with a bluish bloom, which extends back and broadens between the two velvety ones; corium without a trace of the usual sub-basal whitish cross-bar of the genus, the one on apical third present but short, not reaching claval suture and enclosed by a small bluish area; narrow basal half and a broad cross-bar

just behind the white one, velvety black, area behind the velvety bar and entire cuneus steel-gray; membrane dusky-translucent, the cells and a spot behind tip of cuneus darker; femora dark brown, shining; knees and tips of coxæ yellowish, tibiæ and tarsi pale brown; pleura dark brown, ventrals shining black. Joint 1 of antennæ brown, paler at base and tip, slightly shorter than width of vertex; 2 brownish-yellow, darker toward apex, gradually thickened from the base, four times as long as 1; 3 dull yellow, minutely pubescent, two-fifths as long as 2, 4 missing. Pronotum campanulate, basal portion strongly and evenly convex, little longer, but much wider and higher than front one, minutely granulate or subalutaceous. Scutellum small, moderately convex. Elytra strongly constricted, the basal half of corium less than half the width of apical third. Hind tibiæ, male, almost twice as long as femora, very slender, slightly flattened, feebly curved. Length, 6 mm.

Type, a male in the collection of the Division of Entomology, State Department of Agriculture, Raleigh, N. Car. Taken at Windsor, N. Car., July 7, 1925. Named in honor of C. S. Brimley, of Raleigh, who has furnished many specimens to aid my work on Heteroptera. It differs from all described forms of the genus in having but one whitish cross-bar on corium, in the form of the bluish bloom-covered spot on clavus, in the distinctly bell-shaped pronotum and very narrow basal half of corium.

850 (—). *PILOPHORUS VANDUZEEI* Knight, 1923, 540.

Head and pronotum blackish-brown, opaque, sparsely clothed with deciduous silvery hairs and erect bristle-like darker ones; scutellum shining black with similar silvery scales; basal two-thirds of elytra dark velvety-brown, the area behind posterior silvery bar, including cuneus, polished fuscous-brown; membrane dusky translucent with a darker lunate spot at apex of larger cell; under surface and femora dark fuscous-brown; tibiæ paler brown; front coxæ in part yellow. Joints 1—3 of antennæ reddish- to blackish-brown, 1 two-thirds the length of width of vertex; 2 five times as long as 1, gradually thickened from base to apex, much more so in female, 3 about two-fifths the length of 2, 4 pale, darker at tip, nearly as long as 3. Beak reaching onto middle coxæ. Pronotum with sides much less deeply sinuate than in *amænus* Uhl., the basal half of disk finely, transversely rugose-granulate. Scutellum with apical half and sides flattened, middle third with an obtuse tubercle. Hind tibiæ of male strongly flattened, distinctly curved. Length, 5—5.3 mm.

Lake County, Ind., July 14. Beaten from the gray pine, *Pinus divaricata* (Ait.). Lakehurst and Jamesburg, N. J.; Staten Island, N. Y., August (Davis). Recorded only from Massachusetts, New Jersey, Maryland and Washington, D. C. Occurs on the red pine, *Pinus resinosa* Ait. Distinguished by its dark color, erect black hairs of upper surface and feebly sinuate sides of pronotum. The *P. crassipes* Van Duzee (1918, 293) *nec*. Poppius is a synonym.

851 (—). *PILOPHORUS UHLERI* Knight, 1923, 541.

Form and size of *vanduzeei*. Pronotum black, thinly clothed with suberect black hairs—but without silvery scale-like hairs. Elytra as in *vanduzeei*, the posterior silvery line distinctly broader; sides of ventrals 3—6 each with an oblique patch of silvery scale-like pubescence. Joints 1 and 2 of antennæ blackish-brown, 1 two-thirds as long as width of vertex, 2 four and two-third times as long as 1; 3 as in key, sometimes suffused with pink, nearly one-third as long as 2; 4 pale, dusky towards tip, one-tenth shorter than 3. Beak reaching tips of middle coxæ. Hind tibiæ feebly compressed, not distinctly flattened as in *vanduzeei*. Length, 5 mm.

Batavia, N. Y., July 14; Olivia, Minn., June 28 (*Minn. Univ. Coll.*). Recorded only from Ontario and New York. Breeds on the tamarack, *Larix laricina* (Du Roi), and the Scotch pine, *Pinus sylvestris* L.

852 (—). *PILOPHORUS BUENOI* Poppius, 1914, 243.

Brownish-yellow, clothed with short erect hairs; base of head, pronotum toward base and scutellum brownish-black; clavus, corium behind posterior cross-bar, cuneus and ventrals a deeper shining black; membrane black, not translucent. Joint 1 of antennæ yellow, about one-third shorter than eye; 2 reddish-yellow, feebly gradually thickened toward tip, three and a half times longer than 1. Head strongly inclined, narrower than basal margin of pronotum. Beak reaching middle coxæ. Pronotum about one-half shorter than wide at base, hind margin truncate, one-half wider than front one; sides rather strongly concave. Scutellum moderately convex. Elytra slightly constricted, surpassing abdomen. Length, 3 mm.

Described from Southern Pines, N. Car., and known only from there. Most closely related to *P. laetus*, but head narrower and longer, second antennal more gradually thickened and upper surface beset with short stiff hairs.

853 (—). *PILOPHORUS STROBICOLA* Knight, 1926b, 19.

Head and pronotum dark brown to blackish, clothed with fine silvery scale-like pubescence; scutellum chestnut-brown or black with a row of similar pubescence each side; basal two-thirds of elytra dull reddish-brown with the usual cross-bars of silvery pubescence, the hind one slightly interrupted at suture, the area behind it including cuneus, polished fuscous brown; membrane dusky translucent, faintly iridescent, the large cell in great part fuscous; legs reddish-brown; under surface dark chestnut-brown, shining, sides of ventrals 3—6 of male with an oblique patch of silvery-gray pubescence. Joint 1 of antennæ reddish-brown, four-fifths as long as width of vertex; 2 five times as long as 1, strongly clavate, more so in female, the apical third darkest; 3 yellowish-white, one third the length of 2; 4 pale fuscous, but little shorter than 3. Basal half of pronotum transversely rugose. Middle of scutellum elevated as an obtuse tubercle. Length, 5—5.2 mm.

Blowing Rock, N. Car., June 9 (*Brimley*). Clayton, Ga., June (*Davis*). Ranges from Quebec and New England west to Minnesota and southwest to Georgia. Breeds on the white pine, *Pinus strobus* L. The long, strongly clavate second antennal and pale third one, together with the strongly compressed hind tibiae, distinguish this from its nearest allies. Poppius (1914, 243) described *P. crassipes* from Manitou, Colo., Riverton and Lakehurst, N. J., Washington, D. C., and Williams, Ariz. Knight (1923, 542) described the species he now calls *strobicola* under the name of Poppius, but later (1926b, 19) restricted the name *crassipes* to the western forms of Poppius and placed the eastern forms of that author under *vanduzeei* Knight.

854 (—). *PILOPHORUS PICEICOLA* Knight, 1926b, 19.

Color of *strobicola*. Basal portion of elytra yellowish-brown, clothed with recumbent black hairs and a few yellow scale-like ones. Posterior silvery bar straight, entire. Joints 1 and 2 of antennæ fusco-brownish, 1 three-fifths as long as width of vertex; 2 five times as long as 1, its apical half more strongly swollen than in *strobicola*; 3 white, darker at tip, one-third the length of 2; 4 pale, apical third fuscous, as long as 3. Length, 3.8—4.2 mm.

Known only from southern New York, where it was taken by Bueno in July from spruce.

855 (1129). *PILOPHORUS CINNAMOPTERUS* (Kirschbaum), 1855, 116.

Pale cinnamon-brown, sparsely clothed with very short yellowish-hairs; pronotum and scutellum black; area of corium behind posterior bar shining brown; cuneus brown with a small white pubescent spot at inner basal angle; membrane fuscous-brown, iridescent; legs brown, base of femora reddish-yellow; tarsi brownish-yellow, third joint and claws piceous. Joint 1 of antennæ brownish yellow, one half as long as width of vertex; 2 fuscous-brown, paler toward base, thickened toward apex, four and one-half times as long as 1; 3 black, base reddish, three-eighths as long as 2; 4 yellowish-white, apex brown, slightly shorter and more slender than 3. Beak reaching first ventral. Pronotum and scutellum finely transversely wrinkled, the latter with a crescent-shaped bar of white pubescence near tip. Length, 4 mm.

Herne Bay, England, August (*British Mus. Coll.*). A European species recorded in this country only by Osborn (1900, 12) from Ohio. Occurs in Europe on oaks and *Pinus sylvestris* L. Readily known from *strobicola* by the dark third antennal and small white spot on cuneus.

856 (1131). *PILOPHORUS AMCENUS* Uhler, 1887a, 30.

Head and pronotum dark fuscous-brown, subopaque; scutellum dark brown, a small tuft of white hairs near apex and another each side of

base; basal two-thirds of elytra dull brownish-yellow with straight white cross-bar reaching claval suture at basal third of corium and another at apical third; area behind the latter fuscous-brown, shining; membrane a uniform dusky translucent; under surface piceous-brown, strongly shining, legs dark chestnut-brown. Joints 1 and 2 of antennæ dark reddish- or fuscous-brown, 1 half as long as width of vertex, 2 four and a half times as long as 1, 3 and 4 brownish-yellow, darker towards tips, 3 two-fifths the length of 2, 4 slightly shorter than 3. Pronotum with sides deeply sinuate, basal portion somewhat flaring with hind angles prominent, its disk finely scabrous. Scutellum with basal and apical areas flat, the former on a higher plane, the middle with an obtuse elongate tubercle. Elytra smooth. Hind tibiæ of male distinctly compressed. Length, 4.8—5.5 mm. (Fig. 179).

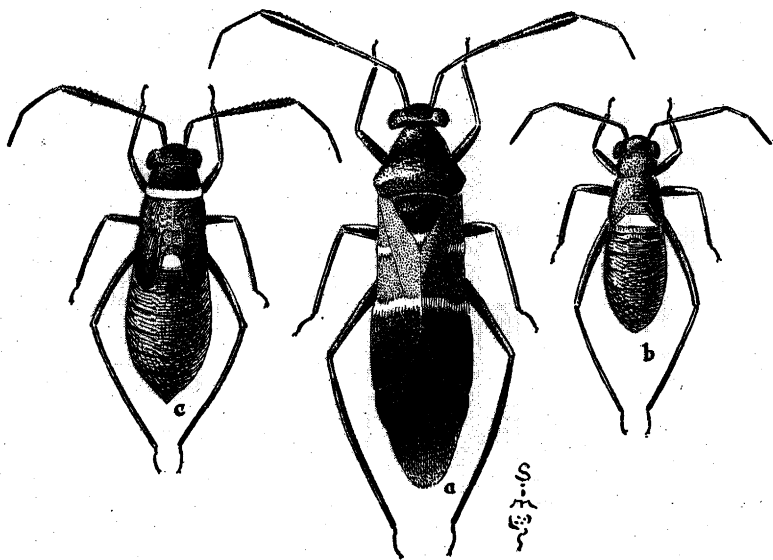


Fig. 179. *a*, Adult X 10; *b* & *c*, nymphs.  
(After Drake, Tech. Publ. 16, N. Y. St. Coll. For.).

Floyd and Crawford counties, Ind., June 23; beaten from foliage of yellow pine, *Pinus echinata* Mill. The known range extends from Ontario and New England west to southern Indiana and southwest to Maryland. Recorded also from California and New Mexico. Drake (1923, 77) found it common about Cranberry Lake, N. Y., June to August, on yellow birch, beech, maple, white pine and herbaceous plants. Breeds on white pine.

857 (—). *PILOPHORUS LÆTUS* Van Duzee, 1918, 294.

Piceous, more or less castaneous, head, antennæ and legs paler; base of elytra bright cinnamon-brown, the apical area and posterior silvery line as in *ee* and *hh* of key; cuneus with a silvery point on inner basal

angle; front and hind coxæ and basal joint of tarsi whitish. Joint 1 of antennæ brownish; 2 five times as long as 1, pale at base, its clavate apical third blackish; 3 whitish, fuscous at tip, two-fifths the length of 2; 4 dusky, slightly longer than 3. Beak reaching hind coxæ. Elytra much wider toward apex. Length, 3.5–3.7 mm.

Recorded only from Washington, D. C., and Woodbine, N. J., where it occurs in June and August on *Pinus virginiana* Mill.

858 (—). *PILOPHORUS JUNIPERI* Knight, 1923, 543.

Dark brownish-black; elytra in front of posterior silvery line fulvous; membrane blackish toward base, pale fuscous apically and along sides of cuneus; legs fuscous brown; ventrals dark brown, shining, sides of segments 3–5 each with a patch of silvery hairs. Joint 1 of antennæ brown, three-fifths as long as width of vertex; 2 as in key, brown, apical half black, four times as long as 1; 3 pale, fuscous toward tip, two-fifths as long as 2; 4 fuscous, as long as 3. Beak reaching between middle coxæ. Length, 3.7 mm.

Gray Cloud, Minn., July 20 (*Minn. Univ. Coll.*). Ranges from New England west to Minnesota and south to New Jersey. Breeds on red cedar, *Juniperus virginiana* L.

## GROUP II.—PILOPHORUS.

### KEY TO EASTERN SPECIES OF GROUP II, PILOPHORUS.

- a. Elytra dark brownish-black with apex of clavus as well as corium polished behind posterior silvery line; front silvery line projected somewhat obliquely backward, nearly or quite reaching the hind one; length, 4.1 mm. 859. *FURVUS*.
- aa. Elytra cinnamon-brown to fulvous, only the polished apical area dark brown to piceous.
  - b. Second antennal subequal in length to width of vertex; length 3 mm.
    - c. Front half of head not conically produced; eyes not covering front angles of pronotum. 860. *HEIDEMANNI*.
    - cc. Front half of head conically produced; eyes strongly concave behind, so set as to completely cover front angles of pronotum. 861. *NASICUS*.
  - bb. Second antennal almost equal to width of head across eyes; length 3.5 mm. 862. *DEPICTUS*.

859 (—). *PILOPHORUS FURVUS* Knight, 1923, 539.

Dark brownish-black; pronotum with side margins reddish-brown; basal angles and apex of scutellum with a tuft of silvery scale-like hairs; elytra as in key; cuneus piceous, polished and with a silvery spot near inner basal angle; membrane pale fuscous, apical half of cells and middle of disk opaque blackish; legs concolorous with elytra, tibiae somewhat paler, trochanters, joints 1 and 2 of tarsi and apex of hind coxæ, pale; ventrals dark brown, shining, finely pubescent. Joints 1 and 2 of antennæ dark reddish-brown; 1 two-fifths as long as width of vertex, 2 four

times as long as 1; 3 more slender, basal half pale, apical half dark brown, two-fifths as long as 2. Beak not reaching middle coxæ. Mesoscutum broadly exposed. Length, 4.1 mm.

Known only from Lakehurst, N. J.

860 (—). *PILOPHORUS HEIDEMANNI* Poppius, 1914, 240.

General color brown; base of head, hind portion of pronotum and apical third of corium blackish-brown; scutellum, except tip, and remainder of elytra reddish-brown; posterior silvery cross-bar broken into three spots, the middle one the smaller; cuneus shining black, its inner basal angle with a small patch of white scales; membrane smoke-brown; ventrals and legs brown; coxæ and joints 1 and 2 of tarsi yellowish-white. Antennæ blackish-brown, joint 1 paler, not reaching tip of tylus; 2 gradually thickened from base to apex, not quite twice as long as 1. Beak reaching tips of middle coxæ. Pronotum about one-half shorter than wide at base, hind margin concave, almost twice as wide as front one. Scutellum strongly convex, only its tip flat. Elytra in both sexes slightly surpassing abdomen. Length, 3—3.2 mm.

Recorded only from Virginia and West Virginia, where it was taken by Heidemann in August and September.

861 (—). *PILOPHORUS NASICUS* Knight, 1926b, 18.

Head and pronotum fuscous-black; elytra yellowish-brown; cuneus, apical area of corium and embolium dark fuscous-brown, shining, cuneus with a tuft of silvery scales on inner basal angle; silvery cross-bars of elytra interrupted, the hind one composed of four tufts of silvery hairs set on dark brown spots; membrane and veins fuscous-brown; legs yellowish-brown; ventrals dark brown, the two basal ones paler. Joint 1 of antennæ two-thirds as long as width of vertex; 3 and 4 brownish-black, pale at base, 4 slightly shorter than 3. Scutellum rather strongly convex with tufts of silvery scales on basal angles and apex. Length, 2.9 mm.

Known only by a single male taken by Davis in November at Newberry, Fla.

862 (—). *PILOPHORUS DEPICTUS* Knight, 1923, 539.

Head and pronotum brownish-black; scutellum and membrane as in *furvus*; elytra as in *aa* of key, the posterior silvery cross-bar twice interrupted; entire area behind it, including cuneus, piceous, polished; legs brownish-black, trochanters and apical half of hind coxæ, white. Joint 1 of antennæ brownish, slightly less than one-half as long as width of vertex; 2 black, brownish at base, four times as long as 1; 3 and 4 fuscous, paler at base, 3 two-fifths as long as 2, 4 slightly shorter. Beak reaching between middle coxæ. Apical half of elytra flaring, widest at cuneal fracture. Length, 3.5 mm.

Known only by a single female taken near Washington, D. C., and now in the Cornell University collection.



## GROUP III.—PILOPHORUS.

## KEY TO EASTERN SPECIES OF GROUP III, PILOPHORUS.

- a. Posterior transverse silvery line of clavus and corium nearly straight, bent slightly forward on commissure. 863. PERPLEXUS.
- aa. Posterior transverse silvery line of clavus and corium dislocated and projected forward on commissure.
  - b. Joint 2 of antennæ shorter than the distance between tip of tylus and basal margin of pronotum; smaller, length not exceeding 3.5 mm.
    - c. Beak scarcely reaching hind margin of mesosternum; inner portion of posterior silvery band not projected forward to form a transverse line with that on clavus. 864. WALSHII.
  - cc. Beak reaching middle of hind coxæ; inner portion of interrupted posterior silvery band projected forward and forming a transverse line with that on clavus. 865. GEMINUS.
- bb. Joint 2 of antennæ as long as or longer than distance between tip of tylus and basal margin of pronotum; larger, length 4 or more mm.
  - d. Clavus of the same brown color as corium; joint 2 of antennæ subequal in length to distance between tip of tylus and base of pronotum. 866. BRUNNEUS.
  - dd. Clavus distinctly darker bordering scutellum and commissure; joint 2 of antennæ distinctly longer than distance between tip of tylus and base of pronotum. 867. CLAVATUS.

863 (—). *PILOPHORUS PERPLEXUS* Douglas & Scott, 1875, 101.

Head, pronotum and scutellum fuscous-brown to blackish; elytra uniformly dark brown clothed with minute yellow pubescence, the posterior silvery cross-bar as in key; membrane uniformly dark fuscous, feebly iridescent. Joint 1 of antennæ brownish, only one-third as long as width of vertex; 2 brown, darker toward apex, nearly five times as long as 1; 3 and 4 fuscous, paler toward base, 3 two-fifths as long as 2, male, four-fifths as long as 2, female; 4 slightly shorter than 3, male, one-half the length of 3, female. Scutellum with a short white pubescent stripe each side of base. Length, 4 mm.

Hollington and Woodstreet, England, August (*British Mus. Coll.*). A European species recorded in this country from Nova Scotia and New York. Occurs on goldenrod.

864 (1132). *PILOPHORUS WALSHI* Uhler, 1887a, 30.

Head in great part dull reddish-yellow, the base of vertex fuscous; pronotum fuscous-brown, subopaque; scutellum dark brown, shining, with a row of silvery scales each side; elytra dull yellowish, sometimes darker, with two narrow silvery bands as in *amœnus*, the hind one projected slightly forward on claval commissure, the inner half of the area behind it of the same hue, the outer half and cuneus a polished fuscous-brown; inner basal angle of cuneus with a silvery spot; membrane dusky; legs and under surface in great part dull reddish-yellow, coxæ paler; hind

femora, last three ventrals and tarsi tinged with fuscous. Antennæ with joint 1 and basal three-fourths of 2 reddish-brown, apical fourth of 2 fuscous; 1 three-fifths as long as width of vertex, 2 four times as long as 1; 3 and 4 dusky, 3 paler at base, one-third longer than 4. Pronotum shorter, with sides less sinuate, than in *amœnus*. Length, 3.3—3.5 mm.

Lake and Marion counties, Ind., June 11—July 15; frequent on honey locust (*W. S. B.*). Palos Park and Willow Springs, Ill., May 31—June 28 (*Gerhard*). Recorded from New York west to Iowa, Missouri and Colorado.

865 (—). *PILOPHORUS GEMINUS* Knight, 1926b, 22.

Head and pronotum brownish-black, cheeks and loræ more yellowish; elytra pale cinnamon-yellow, base and apex of clavus, outer half of corium, cuneus and apex of embolium, dull blackish; posterior silvery bar interrupted, its inner portion set forward as in key; membrane fuscous, cells and veins yellowish; legs yellowish-brown, coxæ paler, hind tibiæ fuscous. Joint 1 of antennæ yellowish, half as long as width of vertex; 2 dusky yellow, cylindrical, four times as long as 1; 3 blackish, pale at base, two-fifths the length of 2, 4 black, almost as long as 3. Length, 3.2 mm.

Known only from Minnesota and Woneewac, Wis.

866 (—). *PILOPHORUS BRUNNEUS* Poppius, 1914, 244.

Form of *walshi* but slightly larger. Color darker, vertex and pronotum fuscous-black; basal two-thirds of elytra dark brown; middle of posterior silvery line projected slightly forward, outer half of area behind it and cuneus polished fuscous; membrane dusky translucent; under surface fuscous-brown, shining; legs reddish-brown, the coxæ pale yellow. Joint 1 of antennæ half as long as width of vertex, 2 dark brown, blackish at tip, five times as long as 1, 3 and 4 fuscous, paler at base, 4 three-fourths the length of 3. Length, 4 mm.

Lake and Marion counties, Ind., June 19—Sept. 24; beaten from willow. Recorded only from New York.

867 (1128). *PILOPHORUS CLAVATUS* (Linnæus), 1767, 729.

Elongate, robust for the genus, subdepressed above. Vertex, pronotum and scutellum fuscous-black, subopaque; inner half of clavus fuscous-brown, outer half of clavus and basal two-thirds of elytra dark reddish-brown thinly clothed with short yellowish hairs and with the usual silvery lines, the hind one interrupted on suture; cuneus and outer half of corium adjoining polished fuscous-brown; membrane with a rounded reddish-brown spot at middle, the apical half paler; legs reddish-brown, hind femora tinged with fuscous, all the coxæ in great part dull yellow; under surface fuscous-brown, the sides of ventrals 2—4 with an oblique bar of silvery-gray scales. Joint 1 of antennæ reddish-brown, one-half as long as width of vertex; 2 reddish-brown with apex darker, gradually feebly thickened from the base, five times as long as 1; 3 with basal half reddish-yellow, apical half blackish, two-fifths the length of 2; 4 fus-

cous, three-fifths as long as 3. Pronotum with sides less deeply sinuate than in *amœnus*, the base about one-half wider than apex. Scutellum with an obtuse median tubercle. Length, 4.5—5 mm.

Cary, Ill., Aug. 27, on oak (*Gerhard*). Oliverea, N. Y., June (*Davis*). A European species, recorded in this country from Ontario, Massachusetts, New York, Minnesota and North Dakota. In Europe it occurs on willows, alders and birches.

## II. ALEPIDIELLA Poppius, 1914, 252.

Differs from *Pilophorus* and *Alepidia* mainly by the characters given in generic key. Head strongly inclined, wider than long; vertex almost flat, margined behind; beak reaching middle coxæ; pronotum wider at base than long, base one-third wider than apex, hind margin broadly concave; mesoscutum widely exposed; elytra surpassing abdomen, cuneus wider than long, strongly deflexed; hind tibiæ compressed, slightly curved; joints 1 and 2 of hind tarsi subequal, united about as long as 3. One species is known.

868 (—). ALEPIDIELLA HEIDEMANNI Poppius, 1914, 253.

Blackish-brown; front of head brown; elytra brownish-yellow, tip of clavus and inner apical half of corium darker; outer apical angle of corium and outer margin and tip of cuneus blackish; membrane brownish-yellow, a dark spot at center; ventrals dark brown. Joint 1 of antennæ yellow, seen from the side one-third shorter than eye; 2 blackish-brown, four times longer than 1. Length, 3.5 mm.

Originally described from a single male taken at Washington, D. C., July 18 by McAtee. Not known elsewhere.

## III. ALEPIDIA Reuter, 1909, 75.

"Closely related to *Pilophorus*. Differs in having the second joint of antennæ more slender, scarcely swollen near apex; elytra with sides parallel, not coarctate at middle, destitute of a whitish pubescent fascia and cuneus nearly horizontal." (*Reuter*). One species is known.

869 (1133). ALEPIDIA GRACILIS (Uhler), 1895, 42.

Elongate, subparallel, subdepressed above. Head, pronotum and scutellum fuscous-black, feebly shining; elytra dark fuscous-brown, embolium and basal fourth of corium dull yellow; membrane dusky translucent with usually a darker spot at middle of larger cell; legs greenish-yellow; under surface black, strongly shining. Joints 1 and 2 of antennæ dull yellow, 1 one-half as long as width of vertex; 2 slightly longer than pronotum, its apex often darker; 3 and 4 fuscous, filiform, 3 one-

half as long as 2, 4 two-thirds the length of 3. Beak reaching middle coxæ. Eyes very large, flattened behind, overlapping front angles of pronotum. Pronotum feebly narrowed from base to apex, disk finely wrinkled, hind angles obtusely rounded. Length, 3.8–4.2 mm.

Lake and Marion counties, Ind., July 14–Aug. 15. Kissimmee, Fla., Feb. 16; this the only record for that State (W. S. B.). Jamesburg, N. J., July 2 (Davis). Described from Colorado. Occurs in the east from Massachusetts and New York to Virginia, Florida and Alabama. Breeds on the scrub and red pines. Knight (1926b, 26) has described as var. *squamosa*, a form having several small patches of silvery pubescence on the elytra and includes among his paratypes part of the Indiana and Florida specimens above mentioned.

#### IV. PSEUDOXENETUS Reuter, 1909, 66.

Elongate, slender-bodied glabrous species having the head feebly exserted, wider across eyes than apex of pronotum, its front declivent; eyes large, elongate-oval; beak reaching middle coxæ; antennæ slender, three-fourths the length of body, joint 1 longer than head, 2 feebly thickened toward apex, three times as long as 1, 3 and 4 much more slender, united slightly shorter than 2; pronotum campanulate, apical portion subcylindrical, basal portion convex, much wider, humeral angles subacute, hind margin broadly concave, leaving the convex mesoscutum widely exposed; elytra entire, surpassing tip of abdomen, feebly broadly constricted at middle, commissure twice the length of scutellum, cuneus elongate-triangular, feebly deflexed; joints 1 and 2 of hind tarsi subequal in length, 3 about as long as the others united. Two species are known.

##### KEY TO SPECIES OF PSEUDOXENETUS.

a. Apical half or more of scutellum yellowish-white, remainder black; pronotum and pro- and mesosterna black or dark brown.

870. SCUTELLATUS.

aa. Apical half or more of scutellum black, remainder reddish; basal half of pronotum and pro- and mesosterna reddish.

871. REGALIS.

870 (1160). PSEUDOXENETUS SCUTELLATUS (Uhler), 1890, 81.

Elongate, subcylindrical. Color somewhat variable; head and pronotum usually black, shining; elytra fuscous-black or dark brown, subopaque; apical half or more of scutellum and a bar across base of cuneus yellowish-white, remainder of cuneus piceous, shining, membrane dark fuscous; joint 1 of antennæ brownish above, yellowish beneath, 2 dark brown, 3 and 4 dusky white; legs fuscous-brown, front and middle tibiae

paler; under surface piceous, shining. Head minutely granulate, vertex with a narrow impressed longitudinal line. Basal half of pronotum vaguely transversely rugose. Mesoscutum strongly convex, smooth, shining. Elytra almost smooth. Length, 6.5—7.5 mm.

Scarce throughout Indiana, May 12—July 11; beaten from oak and swept from herbage along margins of woodland. Ranges from Ontario and New England west to Michigan and Illinois and southwest to North Carolina. The records of its occurrence are remarkably few, taking into consideration its rather wide distribution, peculiar form and coloration. Breeds on the yellow and white oaks, *Quercus muhlenbergia* Engl. and *Q. alba* L., and occasionally on ash. In teneral specimens the general color is brownish with basal half of pronotum sometimes reddish as in *regalis*, but scutellum always in part whitish.

871 (1159). *PSEUDOXENETUS REGALIS* (Uhler), 1890, 80.

Differs from *scutellatus* mainly by the characters given in key, the basal half of pronotum and the mesoscutum being reddish or reddish-yellow, as are also the pro- and mesosterna and sometimes the lower part of head; white bar at base of cuneus more often wanting; antennæ blackish to fuscous, basal half of joint 3 pale; legs piceous-brown, the tibiae somewhat paler. Length, 7—7.5 mm.

Sarasota and Dunedin, Fla., Jan. 28—April 1; beaten from its host plant, the live oak, *Quercus virginiana* Mill., recorded also from Bellaire and Jacksonville, Fla. Long Island, N. Y., June 20 (Davis). Ranges from New York and central Illinois, southwest to Florida and Texas. Uhler mentions it as occurring in Pennsylvania on the white-heart hickory, *Hicoria alba* (L.). It is very probable that a large series from all parts of the country will show that this and the preceding are but color forms of the same species, in which case the name *regalis* will have precedence, and our more common northern form will be known as *P. regalis scutellatus* (Uhl.). The Davis specimen, identified by Knight as *regalis*, has the apical half of scutellum white, basal half of pronotum red.

Tribe V. CERATOCAPSINI Van Duzee, 1916a, 211.

To this tribe, as characterized in the key, p. 796, belong two of our eastern genera.

#### KEY TO GENERA OF TRIBE CERATOCAPSINI.

- a. Pronotum with front portion subcylindrical, rather abruptly flaring behind middle, basal half of disk strongly convex; embolar margins sinuate on basal half. I. PAMILLIA.

- aa. Pronotum subtrapezoidal, its sides nearly straight and gradually converging from base to apex, not constricted at middle; embolar margins not sinuate.

II. CERATOCAPSUS.<sup>85</sup>

I. PAMILLIA Uhler, 1887a, 31.

Differs from *Pilophorus* in having the head longer and more convex, front more nearly vertical; antennæ much stouter, of nearly equal thickness throughout, joint 1 three-fifths as long as width of vertex, 2 longer than pronotum, four times the length of 1, 3 and 4 subequal, united one-fifth longer than 2; pronotum as in key, calli wanting; elytra widened behind the middle, outer margin of corium broadly curved; cuneus broader at base than long, strongly deflected, the fracture deep; arolia free, converging apically. Two species are known, one occurring in our territory.

872 (—). PAMILLIA DAVISI Knight, 1923, 535.

Elongate, widened behind middle. Dark reddish-brown, finely pubescent; joints 1 and 2 of antennæ brownish-yellow, 3 and 4 dark brown, thickly clothed with fine short yellow hairs; basal half of clavus paler brown, both it and corium sparsely beset with short erect black bristles; corium with a pale brown pruinose band across middle and a strongly shining area on apical third; basal half of embolium amber-brown, translucent; membrane brownish-black, paler towards tip; legs reddish-brown, trochanters and tips of coxæ paler; ventrals dark brown, strongly shining, the third pruinose. Front of head and vertex alutaceous. Beak reaching between middle coxæ. Scutellum transversely rugose, apical third opaque. Length, 3.8 mm.

Recorded only from Manumuskin and Lakehurst, N. J., where it was taken in September by Davis.

II. CERATOCAPSUS Reuter, 1876, 87.

Oblong-oval, feebly shining species having the head inserted in thorax to eyes, wider across eyes than apex of pronotum, its front declivent; vertex with a median longitudinal impressed line; beak slender, reaching or surpassing middle coxæ; antennæ stout, shorter than body, joints 2 and 3 of nearly equal thickness, 3 usually stouter than 4, the relative length of all joints variable as to species; eyes prominent, more so in male, coarsely granulated; pronotum as in generic key, trapezoidal,

<sup>85</sup>The principal characters separating *Tirysus* (*Trichia*) Reut. from *Ceratocapsus* Reut., as set forth by Reuter (1876) and Van Duzee (1916a, 212) hold good of the males only. Of the two species included under *Tirysus* by Van Duzee (1917, 38) one, *punctulatus*, is herewith included under *Ceratocapsus*. The other, *T. elongatus* (Uhl.), was described from Colorado and California and mentioned by him, probably in error, as occurring in Florida. No other record of its occurrence in that State can be found and it is not, therefore, treated in this work.

without apical constriction, calli vague or wanting, basal half convex, declivent forward, base twice or more the width of apex, hind margin truncate, covering mesoscutum; elytra entire, male, sometimes brachypterous, female, clavus strongly declivent toward corium, cuneus and membrane subhorizontal, the fracture weak; basal joint of hind tarsi shortest, 3 nearly as long as 1 and 2 united. Nineteen species are recorded or known from the eastern states. For convenience these are separated into two groups.

## KEY TO GROUPS OF EASTERN SPECIES OF CERATOCAPSUS.

- a. Pronotum not or indistinctly punctate, often more or less alutaceous.  
Group I, p. 821.
- aa. Pronotum punctate, sometimes finely yet always distinctly so.  
Group II, p. 826.

## GROUP I.—CERATOCAPSUS.

## KEY TO EASTERN SPECIES OF GROUP I, CERATOCAPSUS.

- a. Upper surface clothed only with simple pubescence, this sometimes in the form of long pilose hairs.
- b. Head in great part and third and fourth antennals red; pronotum and elytra uniform pale yellowish; length, 4.5 mm.  
873. LUTESCENS.
- bb. Head and antennæ not distinctly red; upper surface more or less darkened.
- c. Upper surface dark brown; elytra with a broad yellowish cross-bar just behind apex of scutellum.  
874. FASCIATUS.
- cc. Elytra without a pale cross-bar.
- d. Beak reaching hind coxæ; length more than 3.5 mm.
- e. Head and pronotum not or scarcely darker than elytra.
- f. General color brownish-yellow to fuscous, basal half of elytra frequently paler; cuneus brown or fuscous; form robust; length, 4.3 mm.  
875. MODESTUS.
- ff. General color chestnut-brown, shining; cuneus red; form slender; length, 3.6 mm.  
876. ADVENUS.
- ee. Head and pronotum shining, black; elytra yellowish with fuscous cloud on corium; form slender; length, 4.5 mm.  
877. NIGROCEPHALUS.
- dd. Beak not reaching middle coxæ; length not more than 3 mm.  
878. MINUTUS.
- aa. Upper surface with appressed silky pubescence, usually mixed with more erect pubescent hairs.
- g. Elytra dark brown with a pale cross-bar behind tip of scutellum.  
879. PILOSUS.
- gg. Elytra without a pale cross-bar.
- h. Upper surface clothed with prominent long erect pilose hairs; dark brownish-black, legs and joints 1 and 2 of antennæ yellowish; length, 4.1 mm.  
880. SERICUS.

- hh. Upper surface sparsely clothed with fine short pubescence, sometimes with a few scattering long hairs on scutellum and elytra.
- i. Third antennal not as long as width of vertex plus dorsal width of an eye; upper surface uniformly yellowish. 881. LUTEUS.
- ii. Third antennal longer than width of vertex plus dorsal width of an eye.
- j. Pronotum reddish; basal half of elytra paler than apical half; legs yellowish; third antennal shorter than width of head across eyes; length, 3.4 mm. 882. VICINUS.
- jj. Pronotum blackish; elytra fuscous-brown with a small pale elongate area at basal angles of corium and embolium; legs brownish-yellow to dark reddish-brown; third antennal subequal in length to width of head; length, 4.4—4.7 mm. 883. NIGELLUS.

873 (1137). *CERATOCAPSUS LUTESCENS* Reuter, 1876, 87.

Oblong-oval. Color above and below a uniform pale straw-yellow, shining; head, and often the front margin and a line behind front angles of pronotum, joints 3 and 4 and apex of joint 2 of antennæ, blood-red. Joint 1 of antennæ subequal in length to width of vertex, 2 nearly four times as long as 1, 3 two-fifths the length of 2, 4 one-fourth shorter than 3. Length, 4.3—4.5 mm.

Dunedin, Fla., April 11—23; swept from ferns in dense wet hammocks and taken at porch light. Recorded from Long Island, N. Y., Estero and Sevenoaks, Fla., Kansas and Texas. Van Duzee took it at Estero from "low bushes of a broad leaved oak."

874 (1142). *CERATOCAPSUS FASCIATUS* (Uhler), 1877, 421.

Pale to dark reddish-brown, thickly clothed with very fine prostrate yellowish hairs; elytra with a broad pale yellow bar crossing their entire width just behind scutellum; embolium pale yellow, cuneus tinged with reddish; membrane pale translucent; antennæ and legs pale reddish- to straw-yellow, densely finely pubescent; under surface reddish-brown shining, genital region darker, ventrals thinly clothed with long prostrate yellow hairs. Beak reaching hind coxæ. Antennæ stout, two-thirds the length of body, joint 1 two-thirds as long as width of vertex; 2 visibly thickened from base to apex, three times as long as 1; 3 and 4 as thick as apex of 2, 3 one-half the length of 2, 4 fusiform, two-thirds as long as 3. Pronotum, scutellum and elytra densely minutely scabrous or shagreened. Length, 2.8—3.2 mm.

Staten Island, N. Y., July 8 (*Davis*). Ranges from Ontario and New England west to Colorado and Kansas. Doubtless to be found in Indiana. Occurs on alder and hickory.

875 (1138). *CERATOCAPSUS MODESTUS* (Uhler), 1887b, 69.

Elongate-oval. Dull brownish-yellow, very finely and sparsely clothed with yellowish pubescence; pronotum, scutellum and apical half



of elytra, including cuneus, usually more or less tinged with fuscous, sometimes almost wholly fuscous-black; cuneus and apex of embolium in pale specimens sometimes tinged with reddish; membrane pale dusky translucent; under surface and front and middle legs greenish-yellow; ventrals and hind legs usually darker; tibial spinules blackish. Antennæ reddish-brown, joints 3 and 4 minutely hirsute, apex of 2 often somewhat darker; joint 1 one-third longer than width of vertex; 2 feebly thickened from base to apex, three times longer than 1; 3 nearly half as long and almost as thick as 2; 4 subfusiform, three-fourths the length of 3. Upper surface minutely alutaceous, otherwise almost smooth. Beak reaching hind coxæ. Length, 4.3—4.6 mm.

Frequent throughout Indiana, June 3—July 28; beaten from hickory and wild grape. Dunedin, Fla., March 18, at porch light; the first record for that State. Ranges from Ontario and New England west to South Dakota and Vancouver, and southwest to Florida and Kansas. Recorded also from New Mexico and Grenada. Uhler states that in Maryland it is often common on pine in June and July. He also mentions the pronotum as being "coarsely unevenly punctate," which is not true of the specimens at hand determined by Knight. It is probably in part predaceous, as Van Duzee says that about Buffalo it: "Is not uncommon on pines and a few other trees when infested with aphids."

876 (—). *CERATOCAPSUS ADVENUS* sp. nov.

*Male*—Elongate, slender, sides subparallel. Chestnut-brown, shining, very sparsely clothed with minute pale scale-like hairs and a few scattered longer ones; deflexed basal margin of pronotum, inner edge of clavus and commissure a little paler; cuneus red, its inner basal angle and apical fifth of corium slightly darker; membrane fuscous, base and an elongate spot bordering inner margin of cuneus, yellowish; legs and under surface dark reddish-brown, shining. Joints 1 and 2 of antennæ reddish-brown; 1 as long as width of vertex, 2 three and one-fourth times longer than 1; 3 and 4 fuscous-brown, almost as thick, and united two-thirds as long as 2; 4 fusiform, three-fifths the length of 3. Eyes large, prominent, wider than vertex. Pronotum without evident punctures. Elytra minutely sparsely punctate; surpassing abdomen by three-fourths the length of membrane. Length, 3.6 mm.

Dunedin, Fla., April 9; beaten from limbs of a recently felled pine. Crescent City, Fla. (*Van Duzee*). Evidently allied to *nigrocephalus* Knight, but easily distinguished by the characters given in key.

877 (—). *CERATOCAPSUS NIGROCEPHALUS* Knight, 1923, 534.

Elongate, slender, subparallel. Color as in key; sparsely clothed with suberect hairs; scutellum black; elytra yellowish translucent, base

of cuneus and apical half of corium usually heavily tinged with fuscous; membrane pale at base, apical half and central area between cells fuscous-hyaline; legs pale yellowish-brown, front coxæ reddish to piceous; ventrals reddish-brown to blackish, shining, clothed with yellowish hairs. Joint 1 of antennæ yellowish, fuscous at base, one-fifth longer than width of vertex; 2 yellowish, darker toward apex, four times as long as 1; 3 and 4 fuscous, 3 three-fifths as long as 2, 4 one-half the length of 3. Beak reaching middle of hind coxæ. Pronotum vaguely alutaceous, side margins slightly sinuate, calli evident but vague. Scutellum finely transversely rugose. Length, 4.5—5 mm.

St. Anthony Park, Minn., July 5—6, taken at light (*Minn. Univ. Coll.*). A species of northern distribution ranging from Quebec and New England west to South Dakota.

878 (1141). *CERATOCAPSUS MINUTUS* (Uhler), 1893, 713.

Head pale yellow, middle of front piceous, tylus dusky; pronotum, scutellum and elytra dark brown, strongly shining, clothed with minute golden pubescence; embolium pale yellow, notch and inner margin of cuneus pale; membrane dusky, paler at base; legs ivory-white; ventrals chestnut brown, shining, genital region paler. Joints 1 and 2 of antennæ brown; 2 paler at base, as long as pronotum plus the width of an eye; 3 and 4 more slender, pale yellow, of equal thickness throughout. Head with vertex wider than apex of pronotum, highly polished. Pronotum and elytra obsoletely punctate, the former with side margins slightly sinuate. Length, 2.5—3 mm.

Described from St. Vincent. Recorded by Van Duzee (1917, 382) from Florida and Kansas, without definite station or citation to the Florida record.

879 (—). *CERATOCAPSUS PILOSUS* Knight, 1923, 526.

Dark reddish or chestnut-brown, with pubescence as in key; a broad cross-bar across middle of elytra and a small spot opposite base of cuneus dull yellow; membrane dusky, yellowish at base; front and middle legs, base of hind femora and ventrals 1—3 greenish-yellow; remainder of hind legs and under surface chestnut-brown. Antennæ with joint 1 and basal half of 2 yellowish, remainder reddish-brown, finely pubescent; 1 four-fifths the length of width of vertex, 2 three and two-thirds times the length of 1, 3 two-thirds the length of 2, 4 three-fourths as long as 3. Beak reaching first ventral. Head and pronotum shining, without evident punctures. Scutellum minutely transversely strigose. Elytra very finely shallowly punctate. Length, 3.4—3.6 mm.

Lake Co., Ind., June 30 (*W. S. B.*). Pentwater, Mich., and Willow Springs, Ill., July 8—26 (*Gerhard*). Recorded only from Massachusetts and Minnesota, where it was taken on hop-hornbeam, *Ostrya virginiana* (Mill.) and bur oak, *Quercus macrocarpa* Michx. Apparently differs from *C. fasciatus* only in the character of the pubescence.

880 (—). *CERATOCAPSUS SERICUS* Knight, 1923, 530.

Color and pubescence of upper surface as in key; scutellum, clavus and basal half of corium clothed also with appressed silvery scale-like pubescence; embolium subtranslucent; membrane and veins uniformly pale fuscous with a small pale spot opposite tip of cuneus; legs dull yellow, ventrals dark brownish-black, the genital region with yellowish hairs. Joints 1 and 2 of antennæ yellowish, 1 slightly longer than width of vertex, 2 three and one-half times as long as 1; 3 and 4 dark reddish-brown, 3 one-half the length of 2, 4 three-fourths as long as 3. Beak reaching upon hind coxæ. Head brownish, coarsely alutaceous. Pronotum with side margins slightly sinuate. Scutellum transversely rugulose. Length, 4 mm.

Recorded only from New York, New Jersey and Michigan.

881 (—). *CERATOCAPSUS LUTEUS* Knight, 1923, 527.

Uniform dull yellow, elytra somewhat translucent; membrane pale tinged with dusky, veins yellowish. Joint 1 of antennæ slightly shorter than width of vertex, female, slightly longer, male; 2 three and two-third times the length of 1, slender at base, thicker and somewhat dusky toward apex; 3 dusky yellow, almost half as long as 2; 4 brownish, as thick as 3, one-fifth shorter. Beak reaching hind margins of middle coxæ. Pronotum impunctate, vaguely alutaceous, sides straight. Length, 3.8—4 mm.

Recorded from New York and West Virginia. Resembles *lutescens*, but smaller, head yellow, not red, and pubescence different.

882 (—). *CERATOCAPSUS VICINUS* Knight, 1923, 529.

Head and pronotum tawny- to reddish-yellow; scutellum and apical half of corium dark brown; clavus and basal half of corium yellowish, thickly clothed with appressed silvery scale-like hairs; membrane pale, fuscous toward apex; legs dull yellow; ventrals dark reddish-brown to blackish, shining; genital segment with long yellowish hairs. Joints 1 and 2 of antennæ dull yellow, 1 as long as width of vertex, 2 four times as long as 1; 3 and 4 reddish-brown, 3 slightly more than one-half the length of 2, 4 three-fourths as long as 3. Beak reaching between hind coxæ. Pronotum with side margins straight, calli evident but vague, disk finely alutaceous. Length, 3.4—3.6 mm.

Known only from New York and New Jersey.

883 (—). *CERATOCAPSUS NIGELLUS* Knight, 1923, 528.

Color as in key; scutellum and basal half of elytra with closely appressed pale, scale-like hairs; cuneus usually reddish-brown; membrane and veins uniformly dusky translucent; legs pale to dark reddish-brown, front and middle tibiæ paler; ventrals dark brown to black; genital segment strongly shining, beset with prominent hairs. Antennæ pale to dark reddish-brown, joint 1 one-fourth longer than width of vertex; 2 three and two-third times the length of 1; 3 subfusiform, slightly more

than one-half as long as 2, 4 three-fourths as long as 3. Front of head coarsely alutaceous. Pronotum alutaceous, sides feebly sinuate. Scutellum finely transversely rugose. Length, 4.5 mm.

Kosciusko Co., Ind., July 12 (*W. S. B.*). Galesburg, Ill., June 26 (*Ill. Nat. Hist. Surv. Coll.*). Ranges from New York west to Minnesota and Illinois, and south to Georgia. Occurs from June to August, mainly on trunks and limbs of hickory.

## GROUP II.—CERATOCAPSUS.

### KEY TO EASTERN SPECIES OF GROUP II, CERATOCAPSUS.

- a. Third antennal longer than width of vertex plus the dorsal width of an eye.
  - b. Third antennal shorter than width of head across eyes; brownish-yellow, thickly pubescent, cuneus in part reddish.
    - 884. *PUMILUS*.
  - bb. Length of third antennal subequal to or greater than width of head.
    - c. Smaller, length less than 4 mm.; upper surface with long conspicuous hairs; female ovate, brachypterous.
      - d. General color dark reddish-brown; antennæ of female longer than body; cuneus brown.
        - 885. *SETOSUS*.
      - dd. General color pale brownish-yellow; antennæ of female shorter than body; cuneus of male reddish.
        - 886. *PUNCTULATUS*.
    - cc. Larger, 4.5 mm.; cuneus red, corium yellowish-brown.
      - 887. *DRAKEI*.
  - aa. Third antennal not longer than width of vertex plus dorsal width of an eye.
    - e. Width of vertex of male less than dorsal width of an eye; female with hind femora reddish on apical half; cuneus red.
      - f. Corium yellowish-brown, translucent; under surface brownish-black; fourth antennal four-fifths the length of third.
        - 888. *FUSCINUS*.
      - ff. Corium reddish- to fuscous-brown, not translucent; under surface in great part or wholly red; fourth antennal one-half the length of third.
        - 889. *RUFISTIGMUS*.
    - ee. Width of vertex of male greater than dorsal width of an eye; femora of female greenish or yellowish, not reddish on apical half.
      - g. Upper surface densely clothed with suberect, bristle-like pubescence; apical half of membrane scarcely darker than basal half.
        - 890. *DIGITULUS*.
      - gg. Upper surface more sparsely clothed with semi-erect pubescence; apical half of membrane fuscous.
        - 891. *INCISUS*.

884 (1139). *CERATOCAPSUS PUMILUS* (Uhler), 1887b, 69.

Oblong-oval. Head, pronotum and scutellum more or less fuscous-brown thickly clothed with appressed yellowish scale-like hairs and suberect yellowish ones; head often tinged with reddish; elytra in great part brownish-yellow, embolium and outer third of cuneus yellowish-translucent, inner half of cuneus reddish or fuscous; membrane pale dusky-

translucent, the margins and base adjoining cuneus paler; legs yellow, hind femora often reddish-brown; under surface pale to dark brown, shining; pleura fuscous-brown. Antennæ stout, half the length of body; joints 1—3 yellowish, 1 three-fourths as long as width of vertex; 2 thickly pubescent, more than three times the length of 1; 3 and 4 as thick as apex of 2, 3 one-half the length of 2; 4 and apex of 3 fuscous-brown, 4 one-half as long as 3. Beak reaching apex of middle coxæ. Pronotum and elytra distinctly, finely, sparsely punctate. Length, 3.8—4.2 mm.

Starke, Marion and Posey counties, Ind., July 17—Sept. 6; beaten from ash and wild grape (*W. S. B.*). Staten Island, N. Y., and Jamesburg, N. J., July (*Davis*). Recorded from Sanford and Crescent City, Fla. Ranges from Ontario and New England west to North Dakota and Colorado, and southwest to Florida and Texas, but some of the records doubtless belong to other species. Uhler says that in Maryland it occurs abundantly in June and July on *Cratægus*; also on willows as late as the middle of October.

885 (1140). *CERATOCAPSUS SETOSUS* Reuter, 1909, 70.

*Male*—Elongate-oval. Dark chestnut-brown, thinly clothed with very fine pubescence and with a few scattered suberect yellowish hairs; head, basal portion of hind margin of pronotum, commissure and embolium usually paler; membrane uniform dusky translucent; legs greenish-yellow; under surface fuscous-brown, the genital region paler. Beak reaching first ventral. Antennæ slender, three-fourths the length of body; joints 1 and 2 yellow, 2 as long as head and pronotum united; 3 and 4 fuscous, 3 two-fifths the length of 2; 4 one-half the length of 3. Pronotum finely transversely rugose, finely, unevenly but distinctly punctate, sides straight, basal angle obtuse. Elytra entire, finely, closely and rather deeply punctate. Length, 3.5—3.8 mm. *Female*—Ovate, gradually widened from head backward. Elytra reaching apex of abdomen, their tips separately rounded; clavus scarcely distinct from corium; cuneus absent, membrane very short. Antennæ longer than body. Length, 2.5 mm.

Marion and Knox counties, Ind., June 3—Oct. 30; swept from herbage along the alluvial banks of streams. Dunedin and Sanford, Fla., Nov. 26—April 4. Ranges from New Jersey west to Indiana and southwest to Florida. Recorded also from California. The only previous Florida station records are Lake Worth and Atlantic Beach.

886 (1135). *CERATOCAPSUS PUNCTULATUS* (Reuter), 1876, 82.

*Male*—Elongate, slender, sides subparallel. Pale brownish-yellow, sparsely clothed with long, inclined yellowish hairs; cuneus in great part reddish; membrane pale translucent, iridescent, apical half darker; legs

and antennæ pale yellow. Elytra surpassing abdomen, finely and sparsely punctate. *Female*—Oblong-oval, widest behind the middle. Color and pubescence as in male, front of head, scutellum, apical half of corium and ventrals usually tinged with fuscous. Pronotum trapezoidal, but slightly wider at base than long, at middle, disk finely sparsely punctate; calli large, prominent, well separated. Elytra reaching sixth dorsal, finely and thickly punctate, tips subtruncate, cuneus poorly differentiated, membrane scarcely evident. Antennæ in both sexes with joints 1 and 2 pale yellow, 1 three-fourths as long as width of vertex, 2 three and one-half times the length of 1; 3 and 4 dusky yellow, 3 two-fifths the length of 2, 4 one-half as long as 3. Length, 2—3 mm.

Hillsboro Canal and Dunedin, Fla., Dec. 19—March 24. Beaten from foliage of wax-myrtle and taken from beneath boards. A neotropical species, described from Texas. Known from the West Indies and not before recorded from Florida.

887 (—). *CERATOCAPSUS DRAKEI* Knight, 1923, 533.

Elongate, sides subparallel. Head reddish, vertex darker; pronotum brown, calli piceous; scutellum dark brown, both it and elytra sparsely clothed with erect yellowish hairs, intermixed with short appressed silvery ones; clavus and corium yellowish-brown, translucent; membrane and veins pale, apical half darker; legs yellowish-brown; ventrals brownish-black. Joints 1 and 2 of antennæ dull yellow, apex of 2 darker; 1 one-half longer than width of vertex; 2 three and one-half times the length of 1; 3 and 4 fuscous, 3 three-fifths as long as 2, 4 nearly three-fifths the length of 3. Beak reaching between hind coxæ. Length, 4.5 mm.

Recorded from New York and Alberta.

888 (—). *CERATOCAPSUS FUSCINUS* Knight, 1923, 531.

Oblong-oval. Head dull yellow; pronotum brownish-black, basal fourth of disk yellowish, male, yellowish with only calli dark, female; scutellum brownish-yellow, darker at base, both it and elytra clothed with prominent suberect yellowish hairs, intermixed with shorter, appressed scale-like pubescence; apical half of corium of male often heavily tinged with fuscous; cuneus reddish; membrane pale hyaline, the middle of apical half sometimes darker; legs and ventrals dull yellow, apical half of hind femora reddish. Joints 1 and 2 of antennæ yellow; 1 with a red spot on inner side at base, as long as width of vertex; 2 nearly four times as long as 1; 3 yellowish at base, darker apically, one-half the length of 2; 4 fuscous-brown, as thick as and one-fifth shorter than 3. Beak reaching between middle coxæ. Length, 3.6—3.8 mm.

Marion Co., Ind. July 10 (*W. S. B.*). Batavia, N. Y., Aug. 10; Ramsey Co., Minn., July 11 (*Minn. Univ. Coll.*). Ranges from New York west to Minnesota and south to Maryland. Occurs on the black willow, *Salix nigra* Marsh.

## 889 (—). CERATOCAPSUS RUFISTIGMUS Knight Ms.

Oblong-oval. Head yellow, often tinged with red; pronotum brownish-black, the basal fourth paler; scutellum brownish-yellow, paler toward apex; clavus and corium pale to dark brown, embolium yellow-translucent, cuneus red; membrane a uniform dusky translucent; legs greenish-yellow, the tibiae and basal halves of all the femora more or less tinged with red; under surface greenish-yellow, heavily tinged with red, the pro- and meso-pleura sometimes fuscous-brown. Antennæ stout, half the length of body, of nearly equal thickness throughout; joint 1 yellow with a small red spot near base, longer than width of vertex, male, three-fourths as long, female; 2 yellow, gradually feebly thickened from the base, nearly four times the length of 1; 3 and 4 reddish-yellow, more or less tinged with red, united shorter than 2, 4 one-half the length of 3. Eyes of male very large, their dorsal width greater than that of vertex, coarsely granulated; of female smaller, more narrow than vertex, more finely granulated. Beak reaching between hind coxæ. Entire upper surface, including cuneus, but excepting head and membrane, coarsely, evenly and deeply punctate, each puncture bearing a long conspicuous yellowish inclined hair. Length, 3.2—3.7 mm.

Dunedin, Fla., Nov. 21—April 20. Frequent in fall and spring on ferns and other low herbage in and about the margins of dense hammocks and in low moist grounds; hibernates beneath boards and other cover. The eyes of male are much larger and consequently the width of vertex narrower than in females.

## 890 (—). CERATOCAPSUS DIGITULUS Knight, 1923, 533.

Oblong-oval. Dark brown to piceous with pubescence as in key, on elytra intermixed with appressed silvery scale-like hairs; embolium yellowish-translucent, cuneus reddish or reddish-brown; membrane pale fuscous-brown; legs uniformly greenish-yellow; ventrals dark brown, shining. Antennæ with joints 1, 2 and basal half of 3 yellowish, remainder brownish; joint 1 slightly shorter than width of vertex, male, one-fifth shorter, female; 2 nearly four times the length of 1; 3 one-half as long as 2, 4 three-fourths the length of 3. Beak reaching between hind coxæ. Pronotum and elytra rather coarsely rugosely punctate. Length, 3.4—3.6 mm.

Dubois, Ill., July 2 (*Ill. Nat. Hist. Surv. Coll.*). Recorded only from New York.

## 891 (—). CERATOCAPSUS INCISUS Knight, 1923, 532.

Oblong-oval. Head blackish, reddish beneath; pronotum and scutellum black or brownish-black, the basal half of former often in part paler; elytra brownish-yellow, cuneus reddish or reddish-brown; basal half of membrane and veins dusky, apical half fuscous; legs greenish-yellow; ventrals dark reddish-brown to piceous. Joints 1 and 2 of antennæ dull yellow; 1 tinged with reddish, slightly shorter than width of vertex, male,

subequal thereto, female; 2 slender at base, feebly thickened and dusky apically, nearly four times longer than 1; 3 and 4 brownish, 3 slightly less than half the length of 2, 4 one-fifth shorter than 3. Beak reaching hind margins of middle coxæ. Length, 3.7–4 mm.

Ithaca, N. Y., July 26 (*Minn. Univ. Coll.*). Known only from New York, where it occurs on willow.

Tribe VI. SYSTELLONOTINI Knight, 1923, 497.

This tribe, as characterized in the key, p. 796, is represented in the eastern states by a single genus.

I. SERICOPHANES Reuter, 1876, 79.

Small, elongate, slender, subglabrous species having the head large, its width across the eyes but slightly narrower than base of pronotum, front subvertical, vertex margined behind, merged with the tylus in front; beak reaching hind coxæ; antennæ slender, nearly as long as body, all the joints subequal in thickness; pronotum (macropterous form) campanulate, as wide at base as long, the base nearly twice as wide as apex, disk with sides feebly sinuate, basal portion convex, declivent forward, hind margin truncate, basal angles prominent; elytra

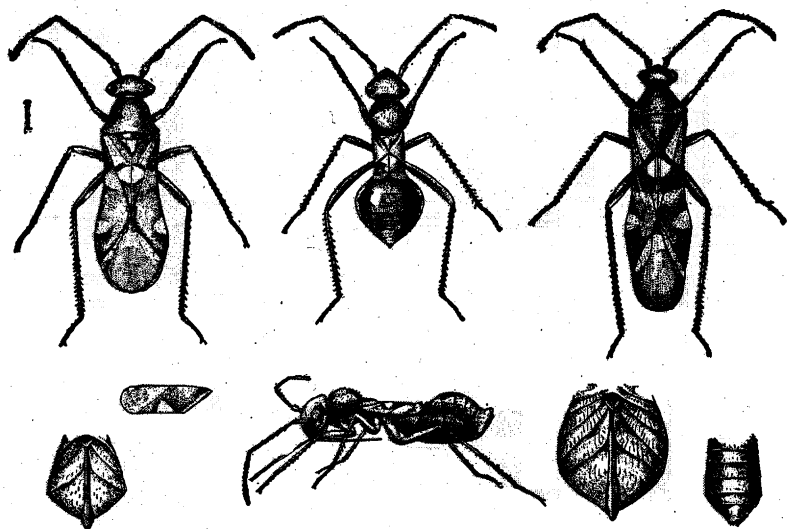


Fig. 180. Above, macropterous female at left, brachypterous female at middle, male at right. Below, abdomen of macropterous female at left; side view of brachypterous female at middle; male abdomen at extreme right. (After Osborn).



dimorphic, in males usually surpassing abdomen, cuneus declivent but fracture weak; legs long, tibiæ finely spinulose, first joint of hind tarsi longer than second. One species occurs in the eastern states.

892 (1097½). SERICOPHANES HEIDEMANNI Poppius, 1914a, 260.

*Male*—Elongate, slender, narrowed at middle. Head, pronotum, scutellum and under surface dark chestnut-brown to blackish; elytra paler brown, with a large rounded pale spot on middle of commissure and two vague oblique silvery-gray blotches on corium, the basal one reaching onto clavus; membrane dusky pubescent, whitish at base; legs reddish-brown, hind coxæ paler. Antennæ with joints 1 and 2 pale brownish-yellow, finely pilose, 1 slightly stouter than the others, a little shorter than width of vertex; 2 cylindrical, nearly five times as long as 1; 3 and 4 fuscous-brown, 3 two-thirds the length of 2, 4 subfusiform, two-thirds as long as 3. Pronotum minutely alutaceous; humeral angles broadly rounded into basal margin. Elytra with costal margins broadly concave, ciliate with minute yellow bristles; disk of corium smooth, beset with a few erect yellowish hairs; membrane surpassing abdomen by more than half its length. *Brachypterous Female*—Ant-like in form. Yellowish brown. Pronotum and abdomen subglobose. Elytra reaching only to base of third dorsal. Length, 3.1—3.5 mm. (Fig. 180).

Marion Co., Ind., Aug. 1; at desk light (*W. S. B.*). Palos Park and Willow Springs, Ill., May 31—June 4 (*Gerhard*). Recorded only from New England, New York and Minnesota, but probably to be found in intervening states north of latitude 40°. Occurs on upland grassy ridges, the males also often at light. Recorded mostly heretofore as *S. ocellatus* Reut., a smaller and much paler Texan species. The *S. noctuans* Knight (1917b, 4) is a synonym of *heidemanni*.

Tribe VII. LOPIDINI Van Duzee, 1916a, 212 (*Lopidearia*).

To this tribe, as characterized in the key, p. 797, belong three of our eastern genera of Orthotylinæ.

#### KEY TO EASTERN GENERA OF LOPIDINI.

- a. Base of vertex without a bristle-bearing ridge across its full width; upper surface not beset with numerous erect black bristles.
- b. Base of tylus below a line drawn through the lower margin of eyes; cheeks not divided by an oblique suture beneath the eyes; elytra in great part green or greenish-yellow.
  - I. ILNACORA, p. 832.
  - bb. Base of tylus above a line drawn through the lower margin of the eyes; cheeks divided by an oblique suture leading from base of antennæ to beneath eyes; elytra usually red and black, never green.
  - II. LOPIDEA, p. 834.

- aa.* Base of vertex with a high carina or ridge extending from eye to eye, this beset with bristles; pronotum and elytra with numerous erect black bristle-like hairs; color fuscous-brown.

III. HADRONEMA, p. 843.

# I. ILNACORA Reuter, 1876, 85.

Elongate, slender, subparallel species having the head wider across eyes than apex of pronotum, its front nearly vertical; vertex flattened, its base carinate at middle; cheeks strongly convex; antennæ about two-thirds the length of body, joints 1 and 2 of nearly equal thickness, 3 and 4 much more slender; pronotum trapezoidal, without subapical stricture, but with a transverse ridge before the calli; scutellum flat, triangular, equilateral; mesoscutum concealed; elytra entire, surpassing abdomen. Three species have been recorded from the eastern states.

## KEY TO EASTERN SPECIES OF ILNACORA.

- a.* Under surface green or greenish-yellow; head wholly dull yellow. 893. STALII.
- aa.* Under surface in great part or wholly black; head black, or yellow with black lines or stripes.
  - b.* Pronotum with a conspicuous round black spot behind each callus; eyes distant from front of pronotum; membrane dark brown. 894. MALINA.
  - bb.* Pronotum with at most a small spot of black pubescence behind each callus; eyes almost contiguous with front of pronotum; membrane dusky hyaline, the veins yellow. 895. DIVISA.

893 (1184).<sup>\*</sup> ILNACORA STALII Reuter, 1876, 86.

Color a nearly uniform pale green, fading to greenish-yellow, sparsely pubescent with inclined whitish hairs and usually with a small spot composed of black scale-like hairs behind each callus, another on base of scutellum and one at inner basal angle of cuneus, these easily abraded and often wanting; membrane pale hyaline with a vague transverse fuscous bar behind the cells; legs and under surface greenish-yellow, the tips of beak and tibiæ and joint 3 of tarsi fuscous. Joint 1 of antennæ slightly longer than width of vertex, pale yellowish with a ring near base and a broader one behind apex, blackish; 2 reddish-brown, usually fuscous at base and toward apex, three and a half times longer than 1; 3 and 4 fuscous, united subequal in length to 2, 4 one-half as long as 3. Length, 5.3—5.7 mm.

Marion, Putnam and Crawford counties, Ind., June 19—Sept. 5; probably occurs throughout the State. Swept from cocklebur, ragweed and other herbage, mainly in low, moist places, though sometimes on high wooded ridges. Ranges from New

York west to the Dakotas, Colorado and Texas. Not recorded in the east south of New Jersey. The pubescence of upper surface is easily abraded and older examples are almost wholly glabrous. In those just emerged the black scale-like hairs form spots as mentioned in the description; often, also, numerous smaller spots on the elytra.

894 (1185). *ILNACORA MALINA* (Uhler), 1877, 419.

Head black, shining, the vertex in part dull yellow; elytra and basal half of pronotum bright green; front half of pronotum a broad stripe each side of scutellum and legs greenish-yellow; a large round spot behind each callus, middle of scutellum and under surface in great part blackish; membrane dark brown, veins in part paler. Joint 1 of antennæ stoutest, slightly longer than width of vertex, fuscous-brown, pale at base; 2 fuscous, three times as long as 1; 3 and 4 dusky, subequal in length, united slightly longer than 2. Calli more prominent with impression between them deeper than in *stalii*. Elytra smooth, when fresh sparsely pubescent with very fine prostrate hairs; middle of corium often with an elongate patch of black deciduous scale-like hairs and sometimes with a vague fuscous stripe along its apical half. Length, 5.5—6 mm. (Fig. 181).

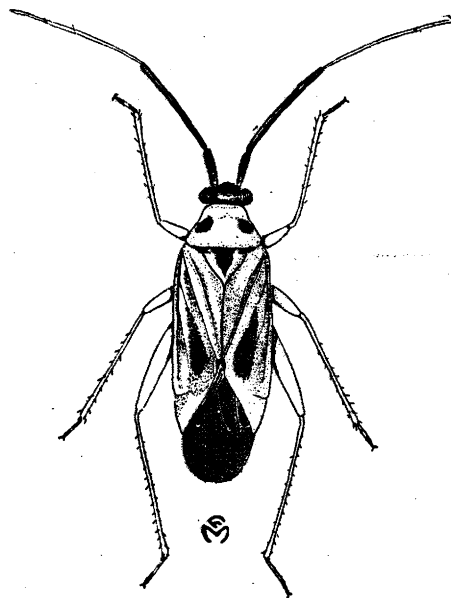


Fig. 181, X 7. (Original).

Common throughout Indiana, May 19—Aug. 20. Swept from foliage of Virginia creeper and poison ivy growing in low alluvial soil; also from herbage in dense woodland. Henderson, Ky., June 15 (*Marshall*). Ranges from New England west to South Dakota and Kansas and south to Maryland. Recorded also from Texas and Mexico. The food plant, according to Knight, is the rough-leaved goldenrod, *Solidago rugosa* Mill., growing in shaded damp places.

895 (1181). *ILNACORA DIVISA* Reuter, 1876, 86.

Pale greenish-yellow, vertex and front of pronotum often paler; head with tylus, a median stripe on vertex and three lines or narrow stripes on front, blackish; disk of pronotum with two small transverse spots of

dense black pubescence; base of scutellum often with a triangular median spot of similar pubescence; antennæ yellowish, joint 1 with a basal and apical black ring, 2 black at base, its apical portion and all of 3 and 4 fuscous-brown; legs yellow, apex of tibiæ and tarsi black; joints 1 and 2 of beak yellow, 3 and 4 piceous; under surface black, opaque, clothed with pale pubescence. Vertex distinctly wider and more flattened than in our other species. Pronotum shorter with sides less convergent from the base. Length, 5 mm.

Marshall and Ft. Snelling, Minn., June 19—July 12 (*Minn. Univ. Coll.*). Described from Texas. Recorded from New Jersey and Colorado.

## II. LOPIDEA Uhler, 1872, 411.

Elongate, subparallel, impunctate, almost glabrous species having the head broader across eyes than apex of pronotum, twice as long as broad, its front vertical, vertex subdepressed and with an indistinct median basal carina; tylus prominent, curved; eyes rather small, rounded, slightly protuberant, contiguous to pronotum, finely faceted; antennæ about two-thirds as long as body, variable in length as to species, joint 1 usually the stoutest, 3 and 4 much more slender than either 1 or 2; beak reaching or surpassing middle coxæ; pronotum subtrapezoidal, about one-half wider at base than long, sides sinuate, disk with a vague but evident constriction in front of middle and a transverse ridge in front of calli, basal portion convex, humeral angles rounded, basal margin subtruncate; scutellum triangular, equilateral; elytra entire, cuneus moderately deflexed. Males with left clasper broad, more or less flattened, tip bifurcate.

The genus is closely allied to *Ilmacora*, but the species are stouter of body with color never green as there. The genus *Lomatopleura* Reut. has been united with *Lopidea* by Knight (1917c, 455) as he found the antennal characters upon which it was chiefly based would not hold good in some of the western forms. He has described 30 or more new species of *Lopidea* since the Van Duzee Catalogue was issued, basing them mainly upon the differences in the genital claspers of the males. The student who wishes to identify them along this line is referred to his papers on the genus as cited in the bibliography. Of the 50 species described from North America up to the present writing, 18 are either recorded or known from the eastern states. The original descriptions of these are widely scattered

and a key leading up to their names very difficult to form. Knight did not attempt one even for the 12 species he included in the Hemiptera of Connecticut. The following will perhaps enable the student to correctly identify the majority of our eastern species:<sup>86</sup>

## KEY TO EASTERN SPECIES OF LOPIDEA.

- a. Joints 1 and 2 of antennæ very stout, joint 1 subclavate, 2 distinctly thicker just behind middle than at apex. (Subgenus *Lomatopleura*).
  - b. Femora black or brown; head in part black; length, 7 or more mm.
  - c. Calli red; scutellum not or but slightly tinged with fuscous.
    - 896. CÆSAR.
  - cc. Calli fuscous; scutellum strongly tinged with fuscous; host plant witch-hazel, *Hamamelis virginiana* L.
    - 898. REUTERI.
  - bb. Femora red; head mostly pale, sometimes tinged with fuscous, the base and rarely the front of vertex black or fuscous; length not more than 6.5 mm.
  - d. Embolium and pronotum wholly red; head wholly pale; calli red.
    - 899. INSTABILE.
  - dd. Embolium and usually the basal angles of pronotum straw-yellow; front of head usually blackish; calli fuscous.
    - 900. MARGINALIS.
- aa. Joints 1 and 2 of antennæ slender, joint 1 cylindrical, 2 not distinctly thicker just behind middle than at apex. (Subgenus *Lopidea*).
  - e. Larger, length 6 or more mm.
  - f. Pronotum without a distinct blackish cross-bar on apical half; coxæ and trochanters in great part or wholly pale; head usually with two fuscous stripes which are more or less confluent behind.
  - g. Joint 1 of antennæ shorter than width of vertex; color orange- or brick-red; scutellum and inner apical halves of clavus and corium at most but slightly tinged with fuscous; host plant, leaf-cup, *Polymnia uvedalia* L.
    - 901. CONFLUENS.
  - gg. Joint 1 of antennæ as long as or slightly longer than width of vertex.
    - h. Scutellum, clavus and corium heavily tinged with black or fuscous.
    - i. General color deep red; middle of basal half of pronotum heavily tinged with fuscous; length, 6—6.2 mm.; host plant, the veiny pea or vetchling, *Lathyrus venosus* Muhl.
      - 902. LATHYRÆ.
    - ii. General color orange- or dull clay-yellow; basal half of pronotum not or lightly tinged with fuscous; length, 6.5—6.8 mm.; host plant, black locust, *Robinia pseudacacia* L.
      - 903. ROBINIÆ.
  - hh. Scutellum, clavus and corium not at all or but lightly tinged with fuscous; length, 6.5—7 mm.; host plant, American bladdernut, *Staphylea trifolia* L.

<sup>86</sup>Three species, *L. hesperia* (Kirk.), *sayi* Knight and *floridana* (Walker) are not included in the key, as no examples of them have been seen, and the original descriptions, copied farther on in the text, contain no definite characters of sufficient importance to readily separate them from their allies.

- j. General color dull clay-yellow. 905. STAPHYLEÆ.  
 jj. General color bright red. 905a. var. SANGUINEA.  
 ff. Pronotum with a more or less distinct blackish cross-bar on or just behind the calli, sometimes almost wholly blackish; middle and hind coxæ and trochanters in great part or wholly black, front ones sometimes pale; head with front in great part black, rarely with two distinct black stripes.  
 k. Basal half of pronotum pale or but feebly tinged with fuscous.  
 l. General color dark red; elytra rarely tinged with fuscous; female with embolium usually pale yellow; host plants, elm, yarrow and probably goldenrod. 906. HEIDEMANNI.  
 ll. General color orange-yellow; apical halves of clavus and elytra always heavily tinged with fuscous; host plant, false indigo, *Amorpha fruticosa* L. 907. AMORPHÆ.  
 kk. Pronotum, except narrow front and side margins, heavily tinged with fuscous; general color fuscous-brown, the narrow costal margin and inner half of cuneus usually orange-red; host plants the balsam poplar, *Populus balsamifera* L., and cottonwood, *P. deltoides* Marsh. 908. CUNEATA.  
 ee. Smaller, length less than 5.8 mm.  
 m. General color red or orange-yellow.  
 n. Pronotum wholly red; coxæ pale yellow; embolium of female pale translucent yellow; host plant, rough-leaved goldenrod, *Solidago rugosa* Mill. 909. MEDIA.  
 nn. Pronotum with calli and base fuscous; coxæ fuscous; embolium of female concolorous with corium; host plant, wild and cultivated phlox. 910. DAVISI.  
 mm. General color black or fuscous-brown.  
 o. Smaller, length, 4.8—5 mm.; legs pale fuscous, basal half of femora and coxæ straw-yellow with a pinkish tinge; host plant, honey locust, *Gleditsia triacanthos* L. 911. INCURVA.  
 oo. Larger, length, 5.7 mm.; legs black, trochanters and coxæ paler; host plant, black willow, *Salix nigra* Marsh. 912. SALICIS.

896 (1143). LOPIDEA CÆSAR (Reuter), 1876, 67.

Deep carmine-red; tylus, joints 1 and 2 of antennæ, tibiæ and genital region black; two vague stripes on front of head, base of vertex, membrane and femora fuscous-brown; scutellum and inner apical half of clavus often slightly tinged with fuscous. Joint 1 of antennæ stout, narrowed at base, about as long as width of head; 2 densely clothed with short stiff inclined black hairs, three and a half times as long as 1, the apical half tapering from the middle toward apex; 3 and 4 finely pubescent with grayish hairs, 3 three-fifths as long as 2, 4 more slender than and two-fifths the length of 3. Pronotum and scutellum smooth, glabrous; clavus and corium very finely and sparsely pubescent, finely rugose. Length, 7—8 mm.

Ft. Montgomery, N. Y., July 26 (*Davis*). The recorded range extends from New England west to Michigan and Colorado and southwest to North Carolina. The only mention of its habits is

that of Hussey who says it is "One of the characteristic Hemiptera of the black oak association on the dunes of southeastern Michigan. Nymphs were numerous early in July and the first adults were taken July 20."

897 (1144). *LOPIDEA HESPERIA* (Kirkaldy), 1902b, 252.

"*Male*—Bright red, fusiform, very finely punctured. Head triangular. Eyes piceous, slightly prominent; rostrum piceous, extending to middle coxæ. Antennæ black, shorter than body; first and second joints slightly dilated; first as long as head; second more than twice the length of first; third a little longer than first; fourth much shorter than third. Prothorax with a callus on each side near fore border. Scutellum, legs, membrane and hind wings black. Legs slender. Length of body,  $2\frac{3}{4}$  lines (4.5 mm.). St. John's Bluff, East Florida. Presented by E. Doubleday, Esq."

The above is the original description of the *Capsus coccineus* Walker (1873, 93). As the name *coccineus* was preoccupied, it was changed to *hesperia* by Kirkaldy and was placed in the genus *Lomatopleura* by Distant (1904, 109).

898 (—). • *LOPIDEA REUTERI* Knight, 1917c, 459.

Deep carmine red; scutellum and margins of commissure reddish-fuscous; corium and cuneus with fuscous marks more narrow than in *cæsar*, sparsely clothed with blackish pubescence; legs black; sternum, ventrals 4—6 and genital segment blackish. Antennæ as in *a* of key, joint 1 slightly shorter than width of head, 2 three and three-fourths times as long as 1, 3 two-thirds the length of 2, 4 three-fifths as long as 3. Length, 7 mm.

Ramapo, N. Y., and Hollister, Mo., July 22 (*Davis*). The known range extends from Massachusetts and New York, west to Missouri and south to Virginia, but as its food plant, witch hazel, is distributed throughout the entire eastern United States and Canada, the range of the insect will probably be found to be almost coextensive.

899 (1145). *LOPIDEA INSTABILE* (Reuter), 1909, 72.

Elongate, suboval. Bright carmine-red; scutellum in part, clavus except the basal fourth, membrane and inner half of corium blackish-fuscous; tibiæ and tarsi black. Antennæ black, joints 1 and 2 thickly clothed with stiff inclined bristle-like hairs; 1 as long as width of vertex, strongly narrowed at base; 2 gradually thickened from base to middle, thence narrowed to apex, three times longer than 1; 3 and 4 thickly clothed with very fine grayish hairs, 3 two-thirds the length of 2, 4 more slender, two-fifths as long as 3. Costal margin very broadly but visibly curved. Length, 5.5—6 mm.

Dunedin, Fla., April 8—20 (*W. S. B.*). Tarboro and Laurel Hill, N. Car., June—July (*Brimley*). Ramsey, N. J., July

(Davis). About Dunedin it occurs in some numbers on the foliage of the scurfy ericad, *Xolisma fruticosa* Michx., and other shrubs in pine woods. Recorded from Crescent City and Sanford, Fla. Ranges from New York west to North Dakota and southwest to Florida.

900 (1145a). *LOPIDEA MARGINALIS* (Reuter), 1909, 72.

Closely allied to *instabile*. Front of head with a black spot, sometimes in great part fuscous; elytra widely and obscurely fuscous; scutellum and calli heavily tinged with fuscous; embolium pale yellow, rarely bright red. Length, 6—6.5 mm.

Willow River, Minn., Aug. 7 (*Minn. Univ. Coll.*). Originally described from Maryland as a variety of *instabile*. Raised to specific rank by Knight on account of distinctions in the male claspers. Recorded by him from Connecticut. Readily known from other species of the subgenus by the pale embolium.

901 (1147). *LOPIDEA CONFLUENS* (Say), 1832, 23; I, 343.

Orange-red to dull orange-yellow; head with antennæ, tylus, beak, base of vertex and two stripes on front, fuscous-black; pronotum vaguely, scutellum, apical two-thirds of clavus and inner third of corium more or less tinged with fuscous; narrow edge of embolium often yellowish translucent; membrane blackish-fuscous; legs fuscous-brown to blackish, the coxæ pale; under surface orange-red, mesosternum and genital region usually darker. Joint 1 of antennæ cylindrical, about one-fifth shorter than width of vertex; 2 linear, of nearly equal thickness throughout, about three times the length of 1; 3 three-fifths the length of 2, nearly twice as long as 4. Form longer, with sides more parallel than in our other species except *staphyleæ* and *robinix*. Length, 6.3—6.5 mm.

Frequent throughout Indiana, June—August. Palos Park, Ill., July 16 (*Gerhard*). Blowing Rock, N. Car., September (*Brimley*). In Indiana it has been taken from the foliage of *Cratægus*; horse gentian, *Triosteum perfoliatum* L.; and other plants along the margins of woods. The recorded range extends from Quebec and New England west to Montana, Colorado and Kansas, and southwest to Texas, but many of the older records doubtless refer to species lately described by Knight.

902 (—). *LOPIDEA LATHYRÆ* Knight, 1923b, 66.

Head, except cheeks, loræ and a vague spot on each side of vertex, black; disk of pronotum fuscous-brown, the narrow front edge and side margins red; scutellum, clavus, membrane and inner half of apical two-thirds of corium dark fuscous-brown; legs fuscous-brown, the tibiæ black, coxæ and trochanters in great part dull yellow; under surface red, the mesosternum and genital region fuscous. Joints 1 and 2 of antennæ black, 1 as long as width of vertex; 2 cylindrical, three times as long as



1; 3 and 4 clothed with a very short pale pubescence, 3 three-fourths the length of 2, 4 two-fifths as long as 3. Length, 6—6.5 mm.

Palos Park, Ill., July 2; Anoka Co., Minn., July 6 (*Gerhard*). Recorded by Knight from Minnesota, North Dakota, Manitoba and Saskatchewan. In Anoka County, Minn., he found it so numerous in July in spots that the host plant, *Lathyrus venosus* Muhl., was largely killed. As this plant occurs in the northern third of Indiana the bug will probably be found in that region. In the Illinois specimens at hand both sexes have the embolium and outer third of cuneus pale translucent yellow, not the females alone, as stated by Knight.

903 (1149). *LOPIDEA ROBINIÆ* (Uhler), 1861, 24.

Dull orange- or clay-yellow; tylus, usually two stripes on vertex, scutellum, clavus, inner apical half of corium and entire membrane fuscous; legs fuscous, the coxæ and basal halves of femora dull yellow; under surface orange- to clay-yellow, the middle of ventrals usually darker; antennæ and beak dark fuscous-brown to black, the segments of the former of the same relative length as in *confluens*. Length, 6.5—6.8 mm.

Vermilion, Marion, Putnam and Knox counties, Ind., July 17—Aug. 15; probably occurs on the black locust wherever that tree is found in the State. Washington, D. C., July (*Gerhard*). Its known or recorded range extends from Ontario and New England west to Indiana and southwest to North Carolina, though the records are few.

904 (—). *LOPIDEA SAYI* Knight, 1918, 212.

"*Male*—Slightly smaller than *staphyleæ*, but very similar in coloration, the antennæ being more nearly linear; bright yellow to light orange, the scutellum and more or less on each side of commissure, fuscous; base of head and each side of median line of front, tylus, rostrum, antennæ, membrane, femora and tibiæ, black. Sternum and sometimes part of the venter, fuscous; genital claspers distinctive of the species. *Female*—Very similar to the male but with more fuscous and less orange in the yellow. Length, 6.1 mm.; width, 2.1 mm." (*Knight*).

The above is the original description. Described from Brown's Ferry on Savannah River, S. Car., and Plummer's Island, Md.

905 (—). *LOPIDEA STAPHYLEÆ* Knight, 1917c, 460.

Dull clay-yellow; calli, narrow base of pronotum, scutellum, apical two-thirds of clavus, membrane and inner half of corium more or less tinged with fuscous; antennæ, tylus and two stripes on vertex, dark brown to blackish; legs and beak in great part blackish-fuscous, coxæ, trochanters and basal joint of beak yellowish; under surface dull orange-yellow, the mesosternum and genital region often darker. Joint 1 of

antennæ equal to width of vertex, male, slightly longer, female; 2 three and a half times the length of 1, its apical third very slightly tapering; 3 linear throughout, three-fourths the length of 2; 4 one-fourth as long as 3. Length, 6.5—6.8 mm.

Marion and Floyd counties, Ind., May 31—June 23; swept from its host plant, the bladder-nut. Recorded from New York, Maryland, Virginia and Michigan. Knight found it common near Batavia, N. Y., the adults maturing July 18. Many of them soon afterward left the host plant, congregating and mating on nearby hickory trees. Hussey records it as very common in late June on *Staphylea* in southwestern Michigan.

905a (—). *LOPIDEA STAPHYLEÆ SANGUINEA* Knight, 1917c, 461.

"Size, structure of antennæ and male genital claspers not differing appreciably from typical *staphyleæ* but the yellow coloration replaced by bright red. Females much resembling those of *reuteri* and *cæsar*, but distinguished from them by the slender form of antennæ." (*Knight*).

Willow Springs, Ill., Aug. 2 (*Gerhard*). Recorded from Massachusetts, Connecticut and Minnesota.

906 (—). *LOPIDEA HEIDEMANNI* Knight, 1917c, 456.

*Male*—Dark red, antennæ, tylus, front of head or two stripes thereon and bar across calli, black or blackish-brown; scutellum, membrane, legs, metasternum and genital region fuscous-brown; remainder of under surface red. Joint 1 of antennæ feebly curved, one-half longer than width of vertex; 2 three and one-half times the length of 1; 3 two-thirds as long as 2, 4 one-fourth the length of 3. Elytra often slightly but visibly tapering from base to apex, the clavus and corium usually with numerous vague oblique rugæ, very sparsely clothed with short fine yellowish-hairs; costal margin with longer suberect blackish ones. Length, 6.7—7 mm. *Female*—Slightly more robust than male, the elytra feebly broadly curved from base to apex. Color somewhat paler, sometimes dull orange-red, the dark cross-bar of pronotum rarely wanting; inner apical halves of clavus and corium often lightly tinged with fuscous; embolium usually wholly pale yellowish. Length, 6.2—6.5 mm.

Marion and Putnam counties, Ind., June 1—July 5; beaten from elm (*W. S. B.*). Columbus, Ohio, July 12; Palos Park, Ill., June 7 (*Gerhard*). Swannanoa, N. Car., June 22 (*Brimley*). The known range extends from New England west to Illinois and southwest to North Carolina. Near Batavia, N. Y., Knight found it breeding on elm, the nymphs feeding and maturing on the tender terminal growth, usually of young trees. Other nymphs were taken from yarrow, *Achillea millefolium* L., and reared to maturity. The vertex of male is more concave, with eyes more prominent and set more obliquely than in the female or in any of our other species.

907 (—). *LOPIDEA AMORPHÆ* Knight, 1923b, 65.

Elongate, subparallel, feebly tapering behind, male; slightly sub-oval, female. Dull orange-yellow with dark markings of head, pronotum, legs and under surface as in *heidemanni*; elytra clothed with fine yellowish pubescence, the inner apical halves of clavus and corium strongly tinged with fuscous; front coxæ dull yellow. Joint 1 of antennæ nearly twice as long as width of vertex, 2 three and one-half times the length of 1; 3 and 4 densely clothed with very fine grayish pubescence, 3 one-half the length of 2, 4 one-third as long as 3. Length, 6–6.3 mm.

Ramsey Co., Minn., July 8–18' (*Gerhard*). Recorded as yet only from the type locality, but as the host plant occurs in Indiana and ranges west of Ohio from Manitoba to Florida, the known range of the insect will probably be much extended.

908 (1152). *LOPIDEA CUNEATA* Van Duzee, 1910, 79.

Oblong-ovate. Fuscous-brown; head dull brownish-yellow to fuscous, base of vertex black, front fuscous with a broad pale median stripe; base of radial vein reddish; outer half of cuneus pale, tip black, inner half red; membrane pale fuscous; legs brown, coxæ, trochanters and sometimes the base of femora, pale yellow; ventrals brown, their sides paler, sometimes with reddish spots. Antennæ black, joint 1 as long as width of vertex, 2 as long as head and pronotum united, 3 two-thirds the length of 2, 4 slightly shorter than 1. Beak reaching hind coxæ. Pronotum with sides broadly reflexed, calli strongly elevated, separated by a deep impression; basal half of disk minutely transversely rugose. Length, 6 mm.

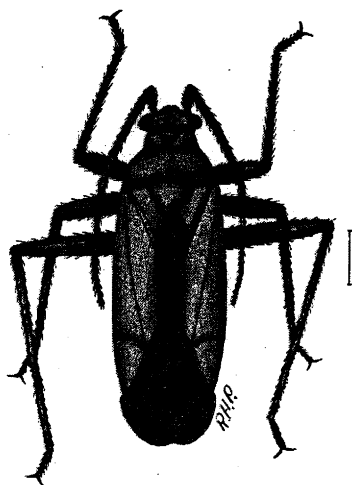


Fig. 182, X 7. (After Lugger).

Gray Cloud and Ramsey county, Minn., July 12–20 (*Minn. Univ. Coll.*). Recorded also from Lancaster, N. Y., and Illinois, the host plants as given in key. Some specimens are almost wholly fuscous-black.

909 (1146). *LOPIDEA MEDIA* (Say), 1832, 22; I, 341.

Bright red to orange-red; tylus and two stripes on front of head blackish; scutellum, apical half of clavus and inner apical third of corium more or less tinged with fuscous, the reddish always showing through the infuscation; membrane and femora fuscous-brown; tibiae black, coxæ pale yellow; under surface red, the mesosternum and genital region blackish.

Joint 1 of antennæ subequal in length to width of vertex, one-third as long as 2; 3 two-thirds the length of 2; 4 one-third as long as 3. Female with the embolium and outer third of cuneus pale translucent yellow. Length, 5.6—5.7 mm. (Fig. 182).

Marion Co., Ind.; June 30 (*W. S. B.*). Swannanoa and Aberdeen, N. Car., June (*Brimley*). Described from Indiana. The recorded range extends from Quebec and New England west to North Dakota, Colorado and Kansas and south to New Jersey, but many of the records are doubtful as to identity. For example, Prof. Uhler once identified for me as *media* what is now recognized as *confluens*, and the name *media* which he made the type of the genus, served for years as a "catch-all" for almost all specimens of *Lopidea* taken from Colorado eastward. In founding the genus (1872, 411) and again (1878, 406) Uhler mentioned his *robinea*, described in 1861, as a variety of *media*, whereas if it is a variety of anything it is *confluens*. It would not be surprising, therefore, if *confluens* was the species he had in hand and therefore the generic type. However, Say's description will fit any one of several species since described more in detail, and calls for a species "one-fourth of an inch (6.2 mm.) in length to tip of hemelytra," whereas what Knight calls *media* is smaller with length as above given.

910 (—). *LOPIDEA DAVISI* Knight, 1917c, 458.

Elongate-oblong, more robust than *media*. General color reddish-orange; antennæ, tylus, front of head and legs black; calli and base of pronotum, scutellum, clavus, inner half of corium and membrane dark fuscous-brown; under surface with middle fuscous-brown to black, sides pale. Joint 1 of antennæ slightly shorter than width of vertex; 2 three and a fourth times longer than 1, 3 two-thirds the length of 2, 4 two-fifths as long as 3. Female more robust than male, with costal margin of elytra very slightly but visibly curved. Length, 5.5—5.7 mm.

Marion, Knox and Posey counties, Ind., June 19—Sept. 19; swept from *Phlox divaricata* L. growing in dense wooded ravines; also taken from the garden phlox, *P. paniculata* L. The known range extends from New York west to Minnesota and Arkansas and south to Virginia. "A serious pest on cultivated *Phlox* and may very well be called the phlox plant bug" (*Knight*).

911 (—). *LOPIDEA INCURVA* Knight, 1918, 214.

Fuscous-brown, often with a reddish tinge; cheeks, loræ, median stripe on vertex, narrow front and side margins of pronotum, embolium and outer margin of cuneus reddish-yellow; membrane, antennæ, beak and tarsi dark fuscous. Joint 1 of antennæ two-thirds as long as width

of vertex; 2 slightly thickest at middle, tapering toward base and apex, nearly four times as long as 1; 3 linear, two-thirds the length of 2; 4 one-third as long as 3. Length, 4.8—5 mm.

Marion and Vigo counties, Ind., June 22—Aug. 1; common July 5 in all stages on foliage of honey locust. Recorded only from Langdon, Mo., and Galesburg, Ill. It is the smallest of our eastern species.

912 (—). *LOPIDEA SALICIS* Knight, 1917c, 457.

Head, calli, scutellum, cuneus and clavus in great part reddish-fuscous; prosternum, propleura and basal angles of pronotum yellowish; remainder of upper surface red. Antennæ dark brown, joint 1 as long as width of head, 2 three times as long as 1, 3 three-fifths the length of 2; 4 one-half as long as 3. Length, 5.7 mm.

Ramsey Co., Minn., June 27 (*Minn. Univ. Coll.*). Known elsewhere only from New York, where it occurred in June on the black willow.

913 (1148). *LOPIDEA FLORIDANA* (Walker), 1873, 97.

"*Female*:—Red, fusiform, very finely punctured. Head triangular. Eyes piceous, prominent. Rostrum extending to hind coxæ. Antennæ black, slender, as long as body; first joint red, as long as head; second more than twice the length of first; third much shorter than second; fourth less than half the length of third. Prothorax with a callus on each side in front. Legs piceous, slender. Membrane blackish. Hind wings cinereous. Length of body, 2 lines. "St. John's Bluff, East Florida. Presented by E. Doubleday, Esq."

The above is the original description of Walker's *Capsus floridanus* and if it refers to a *Lopidea* may be applied to any one of a half dozen or more known species. Only a study of the type will show its present status.

### III. *HADRONEMA* Uhler, 1872, 412.

Elongate, subparallel species having the head wider across eyes than apex of pronotum, its front subvertical; vertex convex without median groove, its base with a prominent, slightly curved carina across its full width; beak reaching middle coxæ; pronotum with a transverse impression behind the calli but without a ridge in front of them as in *Ilnacora* and *Lopidea*; mesoscutum narrowly exposed; elytra entire, cuneus scarcely distinct from corium; entire upper surface beset with numerous erect black bristle-like hairs. Other characters as in *Lopidea*. One of the five known North American species occurs in our territory.

914 (1153). *HADRONEMA MILITARIS* Uhler, 1872, 471.

Black, opaque, with a leaden tinge; flanks and basal half of pronotum in part reddish-yellow; embolium and outer half of cuneus pale yellow; membrane blackish-fuscous; legs and under surface bluish-black, the ventrals sparsely clothed with rather long appressed yellowish hairs, their lateral edges pale. Antennæ black, half the length of body; joint 1 two-thirds as long as width of vertex; 2 cylindrical, three and one-half times the length of 1; 3 and 4 thinner than 2, subequal in thickness, densely clothed with fine yellowish hairs; 3 three-fifths the length of 2, 4 one-third as long as 3. Hind lobe of pronotum conspicuously transversely rugose, its basal angles broadly rounded. Length, 5—6 mm.

Lake Co., Ind., May 29; swept in some numbers from the white false-indigo, *Baptisia leucantha* Torr. & Gray. Ranges from New York west to the Pacific, feeding on several species of *Baptisia*. Recorded also by Distant from Mexico.

Tribe VIII. ORTHOTYLINI Van Duzee, 1916a, 211 (*Orthotylaria*).

To this tribe, as characterized in the key, p. 797, belong eleven of our eastern genera of the subfamily Orthotylinæ.<sup>87</sup>

KEY TO EASTERN GENERA OF TRIBE ORTHOTYLINI.

- a. Disk of pronotum transversely sulcate behind the calli, the sulcus extending over the sides; calli distinctly arched, separated by a depression.
  - b. First antennal not or but slightly longer than width of vertex; female usually suboval, brachypterous, with second antennal distinctly thickened toward apex; color black with pale markings.
    - I. GLOBICEPS, p. 845.
  - bb. First antennal nearly as long as width of head across eyes, thicker on basal half and tapering apically; second antennal linear in both sexes; color green or greenish-yellow.
    - II. BLEPHARIDOPTERUS, p. 847.
- aa. Disk of pronotum without a transverse sulcus; calli not so distinctly arched.
  - c. Pronotal disk margined at sides; second antennal swollen, fusiform; vertex with a distinct basal margin; upper surface sparsely clothed with whitish scales; general color dull red or black.
    - III. HETEROCORDYLUS, p. 847.
  - cc. Pronotal disk without marginal carinæ, the sides sometimes obtusely rounded; second antennal linear, rarely (*Heterotoma*) much thickened and fusiform; basal margin of vertex often feeble or wanting.
    - d. Eyes placed near or before the middle of sides of head; elytra in great part translucent hyaline; costal margin of elytra fringed with fine hairs.

<sup>87</sup>The European species, *Cyllocoris histrio* (Linn.), Van Duzee number 1158, has no definite station record for this country, and Knight (1922, 281) doubts its occurrence. The genus is therefore not included in the key.

- e. Form oblong-oval; membrane of nearly the same texture as corium and with only one cell; base of vertex carinate.

IV. HYALOCHLORIA, p. 848.

- ee. Form elongate, subparallel; membrane differing in texture from corium and with two cells; base of vertex not carinate, male, very obtusely so, female.

V. DIAPHNIDIA, p. 849.

- dd. Eyes placed near hind margin of head, close to pronotal angles; elytra rarely in great part hyaline.

- f. First antennal with a black line on each side, these connected beneath near apex; eyes, viewed from above, elongate, their inner margins parallel; color white or greenish, clothed with rather long white pubescence.

VI. REUTERIA, p. 851.

- ff. First antennal without black lines; eyes not so elongate, their inner margins diverging.

- g. Joints 1 and 2 of antennæ strongly swollen, 2 fusiform; membrane finely rugose; third and fourth antennals united only half the length of second.

VII. HETEROTOMA, p. 851.

- gg. Joint 2 of antennæ linear; membrane not rugose; third and fourth antennals united distinctly more than half as long as second.

- h. Head vertical, viewed from above not prolonged in front of eyes; pronotum of male campanulate, sinuate at base, the humeral angles prominent; female usually brachypterous, the abdomen very broad.

VIII. MECOMMA, p. 852.

- hh. Head declivent, viewed from above prolonged before the front margin of eyes; pronotum trapezoidal, humeral angles not abruptly prominent; sexes similar.

- i. Head strongly compressed apically; vertex declivent behind, not margined at base, usually with a small pale spot each side; basal width of pronotum very little greater than width of head.

IX. CYRTORHINUS, p. 853.

- ii. Head not distinctly compressed apically; vertex usually margined at base, when black never with a pale spot each side; base of pronotum distinctly wider than head.

- j. Base of vertex carinate, sometimes obtusely so, the carina never beset with bristly hairs; beak usually reaching hind coxæ; xyphus moderately sulcate, its sides V-shaped.

X. ORTHOTYLUS, p. 854.

- jj. Base of vertex not carinate, the basal margin beset with bristly hairs and with an alutaceous glabrous spot adjoining the eye each side; beak not passing hind margin of mesosternum; xyphus deeply excavated, its sides U-shaped.

XI. NOCTUOCORIS, p. 865.

# I. GLOBICEPS LePeletier & Serville, 1825, 326.

Elongate, narrow, subparallel species (male) or suboval (female), having the head wider across eyes than long, its front vertical; beak reaching middle coxæ; antennæ shorter

than body, joint 1 stout, subcylindrical, 2 thickened toward apex, more so in female; pronotum elongate-trapezoidal, broader at base than long, otherwise as in key; scutellum triangular, equilateral, convex, with a transverse groove across basal third; elytra dimorphic, in macropterous male longer than abdomen, clavus deflexed to corium, the latter subconvex, cuneus long triangular, feebly deflected; hind tarsi with joint 2 longest, 1 shortest. Three species have been recorded from North America, two of them from our territory.

KEY TO EASTERN SPECIES OF GLOBICEPS.

- a. Elytra of female reaching behind middle of abdomen with membrane short but distinct; second antennal thickened toward apex in both sexes; base of vertex margined in male, not margined in female. 915. FLAVOMACULATUS.
- aa. Elytra of female reaching only base of third dorsal, devoid of clavus, cuneus and membrane; second antennal of male but slightly thickened toward apex; base of vertex not margined in either sex. 916. DISPAR.

915 (1161). GLOBICEPS FLAVOMACULATUS (Fabricius), 1794, 182.

Black, sparsely clothed with short silvery-white hairs; elytra with costal margin pale dull yellow, blackish at base; corium with a large triangular yellowish-white spot on basal half, and a dark brown band across apical fourth, cuneus with basal half yellowish-white; membrane blackish, iridescent, inner cell and spot near tip of cuneus whitish; legs reddish-brown, tibiæ and tips of femora usually paler. Joint I of antennæ brownish-yellow, as long as width of vertex; 2 black, male, paler at base, female, four times as long as 1; 3 and 4 piceous, 3 two-fifths the length of 3, twice as long as 4. Length, 5—6 mm.

(*British Mus. Coll.*). A palæarctic European species recorded in this country from Ontario and doubtfully from Pennsylvania, but Knight (1922, 281) states that these records require verification. Common in England in July on *Umbellifera* and amongst roots of grasses.

916 (—). GLOBICEPS DISPAR (Boheman), 1852, 72.

*Male*—Elongate, subparallel. Black, vertex often with a pale spot each side; clavus and apical half of corium pale fuscous, cuneus and basal half of corium pale translucent, the former with apex and inner margin dusky; membrane pale fuscous, cells whitish, iridescent, veins darker; legs straw-yellow, hind tibiæ and third joint of tarsi dusky; ventrals black, shining. Joint 1 of antennæ dull yellow, as long as width of vertex; 2 black, paler at base, four times as long as 1; 3 yellowish, dusky toward apex, three-fifths the length of 2; 4 fuscous, one-half as long as 3. Pronotum with disk strongly widened across humeral angles. Elytra



surpassing abdomen by one-half the length of membrane. *Brachypterous female*—Suboval. Black, shining; elytra whitish-translucent, with base and cross-bar on apical third fuscous. Head and abdomen subglobose. Second antennal strongly clavate. Elytra oblong, narrowed at base, their tips upcurved. Length, 3.2—4.3 mm.

Fritton and Gimingham, Norfolk, England, August (*British Mus. Coll.*). An introduced European species, known in this country from Glen House, N. Hamp.; Parry Sound, Ontario, and Colorado.

## II. \*BLEPHARIDOPTERUS Kolenati, 1845, 107.

Elongate, narrow, somewhat delicate species having the head wider across eyes than long, its front vertical; beak reaching hind coxæ; antennæ longer than body; pronotum subcampanulate, broader at base than long, humeral angles elevated, hind margin concave; scutellum as in *Globiceps*; elytra entire, longer than abdomen, inner half of clavus flat, outer half deflexed to corium, cuneus long, triangular, feebly deflexed; hind tarsi with joints 2 and 3 subequal, 1 shorter. One palæarctic European species occurs in our territory.

917 (—). BLEPHARIDOPTERUS ANGULATUS (Fallen), 1807, 76.

Elongate, narrow, subparallel. Green or yellowish-green, fading to dull yellow, sparsely clothed with fine suberect dusky hairs; hind angles of pronotum black; elytra subtranslucent, clavus piceous along the commissure, its disk and that of corium with numerous minute dark green dots; membrane whitish-hyaline, iridescent, darker between tips of cells and apex, veins green; legs greenish-yellow, knees of tibiæ black, tarsi brown. Joint 1 of antennæ yellowish, base and sometimes apex black, two-thirds as long as head and pronotum united; 2 more than twice as long as 1, yellowish, with a black ring near base, apex brownish; 3 and 4 piceous-brown, 3 almost as long as 2, 4 one-third the length of 3. Length, 5—5.5 mm.

Cheshunt, England, Aug. 29 (*British Mus. Coll.*). Known in this country only from Halifax, Nova Scotia. Common in England on alders in July and August.

## III. HETEROCORDYLUS Fieber, 1858, 316.

Elongate, rather robust species having the head triangular, slightly wider across eyes than apex of pronotum, its front declivent; beak reaching hind coxæ; antennæ shorter than body; eyes large, prominent; pronotum trapezoidal, sides straight, disk but slightly declivent from the base forward, hind margin truncate; mesoscutum exposed; elytra entire, sur-

passing abdomen, cuneus long, triangular, but little deflexed; hind tarsi with joints 2 and 3 subequal, 1 two-thirds the length of 2. One species occurs in our territory.

918 (1127). *HETEROCORDYLUS MALINUS* Reuter, 1909, 71.

Dark red to fuscous-black, thinly clothed with white closely appressed scales and very fine yellowish hairs. Males usually fuscous-black with basal angles of pronotum and elytra red, embolium and cuneus with a reddish tinge; antennæ, legs and under surface dark fuscous-brown, the ventrals tinged with reddish. Females usually with head, apical half of pronotum, scutellum, inner half of clavus and membrane fuscous-black, remainder of upper surface red; sometimes nearly wholly fuscous. Joint 1 of antennæ subclavate, subequal in length to width of vertex; 2 subfusiform, clothed with bristle-like hairs, three times longer than 1; 3 and 4 linear, clothed with short fine brown hairs, 3 two-fifths the length of 2, 4 one-half as long as 3. Last ventral of male with a deep V-shaped notch. Length, 5.7—6.5 mm. (Fig. 183).

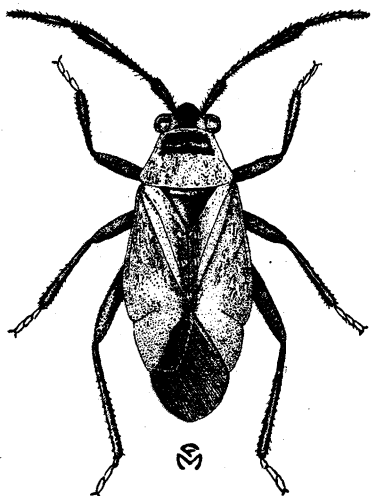


Fig. 183, Female, X 7. (Original).

Vermilion, Fountain, Marion and Harrison counties, Ind., May 10—June 17. Beaten in numbers from the flowers and foliage of the large-fruited thorn or red-haw, *Crataegus punctatus* Jacq. Henderson, Ky., June 1 (*Marshall*). Recorded only from New Hampshire, New York and Glen Ellyn, Ill. Occurs with *Lygidea mendax* Reut. on apple trees in New York, often doing much damage by deforming with their punctures a large proportion of the fruit.

#### IV. *HYALOCHLORIA* Reuter, 1907b, 18.

Small oval, greenish hyaline species having the head narrower than base of pronotum, its front vertical, truncate above, not produced in front of eyes; vertex broadly concave between the eyes and with an impressed median line, its basal margin curved, feebly carinate; antennæ very slender, pilose, half the length of body; pronotum subtrapezoidal, twice as wide at base as long, sides feebly sinuate, apex one-half the width of base, disk with a transverse impression behind the calli which are united at middle to form a preapical collar-like ridge, hind mar-

gin broadly concave, impressed each side near basal angles; scutellum triangular, convex, as long as pronotum with transverse groove in front of the exposed elevated mesoscutum; elytra entire, surpassing abdomen, conjointly oval, costal margin broadly curved; legs slender, tibiæ without spines, finely setose. One of the three known species occurs in Florida.

919 (1168¼). *HYALOCHLORIA CAVICEPS* Reuter, 1907b, 20.

Oblong-oval. Color uniform pale greenish- or greenish-yellow, shining, sparsely clothed with suberect yellowish hairs; eyes brown; apex of scutellum green; tarsal claws fuscous. Joint 1 of antennæ stout, yellow, about one-half as long as width of vertex; 2 greenish, usually fuscous at base and apex, one-fourth shorter than basal width of pronotum; 3 and 4 blackish, subequal in length, united about three-fourths the length of 2. Length, 2—2.2 mm.

Dunedin and Royal Palm Park, Fla., Dec. 1—April 8; swept from low roadside herbage. Described from Jamaica. Recorded heretofore in this country only from Biscayne Bay, Fla.

#### V. DIAPHNIDIA Uhler, 1895, 43.

Elongate, subelliptical, delicate, opaque species having the front of head subvertical, slightly longer than width of vertex, tylus projecting beyond the line of face, curving beneath; beak usually reaching hind coxæ, its basal joint shorter than under side of head; antennæ slender, nearly as long as body; pronotum trapezoidal, side margins almost straight, oblique, disk usually with a shallow impressed line behind the calli; elytra long and wide, nearly flat, subhyaline, the costal margin reflexed; abdomen very narrow. Four species are recorded from the eastern states.

#### KEY TO EASTERN SPECIES OF DIAPHNIDIA.

- a. Larger, length 4 or more mm.; head not black.
  - b. Beak reaching between front coxæ; color green or greenish-white; length, 5.5 mm. 920. *DEBILIS*.
  - bb. Beak reaching beyond middle coxæ.
    - c. Antennæ almost wholly greenish-white; length, 4—4.3 mm. 921. *PELLUCIDA*.
    - cc. Second antennal fuscous or black, third and fourth fuscous; length, 5 m. 922. *PROVANCHERI*.
- aa. Smaller, length 3—3.5 mm.; head black. 923. *CAPITATA*.

920 (1165). *DIAPHNIDIA DEBILIS* Uhler, 1895, 43.

Elongate-oblong. Uniform pale green or greenish-white; pronotum, sides of head and under surface minutely pubescent; beak yellowish, black at tip; legs pale green, tibiæ tinged with yellowish, their spines dark,

base and apex of tarsi piceous; ventrals silvery-greenish. Antennæ yellowish, joint 1 longer than head, stouter than 2, narrowed toward base; 2 cylindrical, as long as outer margin of corium. Pronotum one-third wider than long, disk flat, finely rugose, side margins feebly sinuate in front of humeral angles. Elytra minutely scabrous. Length, 5.5 mm.

Ranges from Ontario and New England west to Colorado and California. Host plant as yet unknown.

921 (1166). *DIAPHNIDIA PELLUCIDA* Uhler, 1895, 44.

Pale green fading to yellowish-white, sparsely clothed with very fine suberect whitish hairs; under surface and legs more yellowish, the genital region, tarsal claws and fourth antennal often tinged with fuscous. Joint 1 of antennæ longer than head, narrowed at base, 2 four times as long as 1, 3 two-thirds the length of 2, 4 one-third as long as 3. Pronotum one-third wider at base than long, calli rather prominent, with an impressed space between them, basal margin straight, hind angles subacute. Clavus and corium minutely scabrous. Length, 4—4.3 mm.

Washington, D. C., July 14 (*Gerhard*). Ranges from Quebec and New England west to the Pacific; in the east not recorded south of Maryland. Host plants, apple, hop hornbeam, maple, hazelnut and hickory. Van Duzee (1912a, 489) says that: "It seems to be common throughout the eastern United States and Canada. It occurs most frequently on hickory trees and has a most annoying habit of biting sharply should it land where the skin is wet with perspiration."

922 (1167). *DIAPHNIDIA PROVANCHERI* (Burque), 1887, 144.

Pale translucent greenish-yellow, sometimes with calli and basal half of pronotum in part vaguely brownish; tibiæ and tarsi usually lightly tinged with fuscous. Antennæ as in key, joint 1 dull yellow, slightly longer than width of vertex, 2 four times as long as 1, 3 three-fourths as long as 2, 4 one-third the length of 3. Length, 5 mm.

St. Anthony Park and Two Harbors, Minn., June 18—Aug. 20 (*Minn. Univ. Coll.*). Ranges from Quebec and New England west to California; in the east rarely found south of latitude 42°. Occurs on hickory, oak, willow, beech and yellow birch.

923 (1168). *DIAPHNIDIA CAPITATA* Van Duzee, 1912a, 490.

Pale greenish-yellow, translucent; head shining black, eyes brown or gray; membrane pale hyaline, feebly iridescent. Joint 1 of antennæ blackish-fuscous, as long as width of vertex, 2 brown, paler at middle, three and one-half times the length of 1. Head smaller, vertex relatively wider and more convex than in our other species. Beak reaching hind coxæ. Length, 3—3.5 mm.

Ottawa, Ont., July 2 (*Van Duzee*). Cloquet, Minn., Aug. 1

(*Minn. Univ. Coll.*). Recorded elsewhere only from New York. Breeds on witch hazel; occurs also on beech and yellow birch.

#### VI. REUTERIA Puton, 1875, 519.

Elongate-subparallel, pubescent species having the head porrect, wider across eyes than apex of pronotum, its front declivent, base of vertex not carinate; eyes large, coarsely granulated; beak reaching hind coxæ; antennæ moderately stout, shorter than body; pronotum trapezoidal, nearly as wide at base as long, sides straight, apex half the width of base, hind margin truncate, basal angles rounded; elytra entire, almost flat, surpassing abdomen; cuneus deflexed, fracture weak, legs long and slender. One species is known.

924 (1169). REUTERIA IRRODATA (Say), 1832, 25; I, 346.

Pale white; elytra and hind femora, when fresh, usually marbled with greenish-black spots; apical fourth of embolium and outer margin of cuneus usually more or less tinged with fuscous; tarsi fuscous-brown. Joint 1 of antennæ with black lines as in key, subequal in length to width of vertex; 2 pale straw-yellow, fuscous at base, three and a half times longer than 1. Commissure longer than scutellum. Entire upper surface sparsely clothed with long whitish hairs; costal margin ciliate with same. Length, 4.3—4.5 mm.

Staten Island, N. Y., Aug. 6 (*Davis*). Swannanoa, N. Car., July (*Brimley*). Described from Indiana. Ranges from Ontario and New York west to North Dakota, Iowa and Kansas and south to Maryland and North Carolina. Recorded also from Europe and Mexico. Breeds on linden and white oak.

#### VII. HETEROTOMA Latreille, 1829, 199.

Elongate, slender species having the head one-half wider across eyes than long, front vertical; antennæ shorter than body, joints 1 and 2 very strongly swollen, 3 and 4 filiform; eyes large, prominent, subglobose; beak reaching first ventral; pronotum trapezoidal, one-third wider at base than long at middle, declivent forward, calli distinct, sides feebly concave, not carinate, front angles rounded, hind ones acute; scutellum triangular, equilateral; elytra surpassing abdomen, clavus deflected to corium, cuneus long, triangular; joints of hind tarsi subequal in length. One species is known.

925 (1180½). HETEROTOMA MERIOPTERUM (Scopoli), 1763, 131.

Olive-gray or dark brown, thickly clothed with appressed whitish hairs and suberect darker ones; inner margin of clavus and costal mar-

gin of corium blackish, the latter ciliate; cuneus tinged with reddish, its outer margin fuscous; membrane blackish with a subtriangular white spot opposite tip of cuneus, veins reddish-brown; legs yellowish-white, joint 3 of tarsi and claws brown; ventrals black. Joints 1 and 2 of antennæ black, thickly pilose with black hairs; 1 cylindrical, as long as head, 2 fusiform, flattened on sides, stouter and three times longer than 1; 3 and 4 fuscous, pale at base, much more slender, united about one-half the length of 2, 4 three-fifths as long as 3. Pronotum finely transversely rugose. Length, 4.5—5 mm.

Horcham Road, Sussex and Muswell Hill, England, July—August (*British Mus. Coll.*). Recorded in this country only from Honeoye Falls, N. Y., where it was taken in a nursery. In England it is said to be common in summer on nettles and other plants along hedges.

#### VIII. MECOMMA Fieber, 1858, 313.

Elongate, sides subparallel, male, oblong-oval, female; head wider across eyes than long, vertex feebly convex, its base not carinate; beak reaching hind coxæ; eyes large, prominent; scutellum triangular, equilateral, with transverse channel near base; elytra of male entire, surpassing abdomen, clavus convex, corium flat; of female, short, reaching middle of abdomen, their tips rounded, the corium only present; hind tarsi with joint 2 longest, 1 shorter than 3.

But one species occurs in our territory, the records of *M. ambulans* (Fall.) from British America belonging to *gilvipes* (Stal), as pointed out by Knight.

926 (1188). MECOMMA GILVIPES (Stal), 1858, 187.

*Male*—Black, elytra in great part dull yellowish-translucent, feebly tinged with fuscous, clavus more strongly fuscous; membrane pale hyaline, veins pale brown; antennæ fuscous-brown, thickly pilose; legs dull yellow. Pronotum campanulate, broader at base than long, its hind margin slightly concave, exposing the mesoscutum. Elytra surpassing abdomen by the full length of membrane, their costal margins finely ciliate. *Female*—Black, shining; elytra dull yellow; legs pale straw-yellow. Antennæ as long as body, joint 1 and base of 2 yellow, remainder piceous; 1 as long as width of vertex, 2 three and one-half times as long as 1, feebly thickened toward apex; 3 three-fourths the length of 2, 4 three-fifths as long as 3. Pronotum subquadrate, front angles rounded, calli large, rather low, separated by a shallow fovea. Elytra obovate, reaching fourth dorsal, their tips broadly obliquely rounded. Length, male, 4.3—4.5 mm.; female, 2.7—3 mm. (Fig. 176, a).

Machias, Me., July 22; Wanakena, N. Y., Aug. 3 (*British Mus. Coll.*). Selkirk Mountains, British Columbia, Aug. 9 (*Minn.*

*Univ. Coll.*). Ranges from Ontario and New England west to the Pacific, north of latitude 42°. Occurs upon rank herbage in moist shaded locations.

# IX. CYRTORHINUS Fieber, 1858, 313.

In addition to the characters given in generic key, the members of this genus have the beak reaching between middle coxæ; antennæ finely pilose, joint 1 three-fourths or more as long as width of vertex; elytra in both sexes entire, longer than abdomen in males, the cuneal fracture subobsolete. Two species occur in the eastern states.

## KEY TO EASTERN SPECIES OF CYRTORHINUS.

- a. Pronotum wholly black; elytra fuscous. 927. *CARICIS* var. *VAGUS*.
- aa. Apical half of pronotum in part pale yellow; elytra sordid white.

928. *PYGMÆUS*.

927 (1186¼). *CYRTORHINUS CARICIS VAGUS* Knight, 1923, 511.

Elongate-oblong. Head, pronotum and scutellum black, shining; elytra a nearly uniform pale subhyaline fuscous, minutely and sparsely pubescent, embolium somewhat paler; clavus sometimes tinged with fuscous; legs greenish-yellow, coxæ and hind femora often in part fuscous. Antennæ fuscous-black, the incisure between joints 1 and 2 pale; joint 1 slightly shorter than width of vertex; 2 three times longer than 1; 3 two-thirds the length of 2, 4 one-third as long as 3. Pronotum minutely transversely rugose. Length, 2.8—3 mm.

Raleigh, N. Car., Aug. 10 (*Brimley*). Recorded elsewhere only from New York, New Jersey and Virginia. Knight (1917b, 250) first recorded this as the European *C. caricis* (Fall.), but later described it as a variety of that species. The typical *caricis* is known from Colorado and in Europe occurs amongst sedges in damp places.

928 (1186½). *CYRTORHINUS PYGMÆUS* (Zetterstedt), 1838, column 279.

Elongate, sides subparallel, male; suboval, female. Head black, shining; pronotum and scutellum fuscous, the former with area in front of and between calli dull yellow; elytra dull whitish-translucent; membrane pale hyaline, iridescent; legs straw-yellow; ventrals dull yellow with a fuscous stripe at sides. Joint 1 of antennæ as long as width of vertex, shining black, its apical fourth yellow; 2 fuscous-black, three times as long as 1; 3 and 4 dusky yellow, subequal in length, united one-third longer than 2. Upper surface sparsely clothed with very fine inclined dusky hairs. Elytra of male slightly surpassing abdomen; of female reaching sixth dorsal. Length, 3—3.2 mm.

Carmarthen and Poole Harbor, England, August (*British Mus.*