

corium dull red, the claval vein and scattered spots on corium yellowish; membrane pale, flecked with small fuscous spots, these merging toward apex, veins reddish; legs dull yellow, femora with small vague reddish spots. Under surface reddish to yellowish, genital region tinged with fuscous. Joint 1 of antennæ dull yellow flecked with reddish, as long as pronotum; 2 much more slender, straw-yellow, brownish toward apex, one and three-fourth times the length of 1; 3 yellowish, dusky at tip, two-thirds as long as 2; 4 pale fuscous, three-fourths the length of 3. Length, 7.4—8 mm.

Known only from Maine and New York.

686 (—). *PHYTOCORIS ULMI*. (Linnæus), 1758, 449.

Elongate, subparallel, male; elytra more oval, female. Brownish-red or reddish-yellow, rather thickly clothed with short yellow appressed hairs intermixed with suberect black ones; pronotum reddish-brown, basal edge yellowish-white, usually preceded by a transverse blackish spot; collar and side margins beset with black bristles; scutellum yellowish, its apical half with a brown spot each side; clavus reddish-brown, its outer margin often paler, tip blackish; corium brownish-yellow, flecked with reddish-brown, its apical fourth with a pale triangular spot; cuneus reddish or fuscous, its basal third paler; membrane smooth, hyaline, thickly flecked with small fuscous spots, veins reddish; front and middle femora pale brown with numerous scattered yellowish spots, hind ones dark brown flecked with whitish dots, the apical half with a pale half ring. Joint 1 of antennæ brownish with pale spots, one-fifth longer than pronotum; 2 and 3 yellowish-brown, 2 more than twice as long as 1, 3 two-thirds the length of 2; 4 fuscous, two-thirds as long as 3. Length, 6—7.5 mm.

Snowdonia and Sussex Co., England, July—Aug. (*British Mus. Coll.*). A European species recorded in this country only from Yarmouth, Nova Scotia. Occurs in Europe on elm, oak, brambles, etc.

687 (928). *PHYTOCORIS ANTENNALIS* Reuter, 1909, 32.

Fuscous to dull yellow; head brownish, base and apex of tylus white; pronotum brownish, basal third darker with hind margin narrowly white and calloused spots as in key; scutellum dull yellow to fuscous with a vague narrow pale median line; corium dull yellow with inner half and a median spot along outer margin fuscous; cuneus blackish along outer margin and apex, the inner basal angle and middle of inner margin each with a tuft of black hairs; membrane fuscous, mottled with numerous paler spots between the cells and opposite apex of cuneus; femora black, paler toward base, hind pair with lower face spotted with paler and upper one with a subapical pale band; front and middle tibiæ reddish to black, the former with three, the latter with four pale rings; hind tibiæ pale tinged with blackish, tarsi fuscous; under surface blackish, the sides unevenly tinged with reddish. Antennæ longer than body, joint 1 brownish-black flecked with paler spots on inner face; 2 twice the length

of 1, with a narrow pale ring in front of base and a broader one beyond middle; 2 brownish, paler at base, about two-thirds as long as 2; 4 fuscous, slightly shorter than 3. Genital segment of male with a broad erect tubercle above base of left clasper. Length, 5—6 mm.

Described from Washington, D. C. Recorded elsewhere only from Massachusetts, New York and New Jersey.

688 (941). *PHYTOCORIS PALMERI* Reuter, 1909, 32.

Sordid white, variegated with fuscous and black; pronotum with sides, narrow antebasal band and three stripes on disk blackish; scutellum shining black, basal angles and apical median line pale; elytra with clavus, inner half of corium and apex of cuneus blackish, margins of scutellum and commissure dirty white; membrane densely flecked with minute fuscous and whitish spots, the veins pale; under surface in great part blackish; femora blackish with pale lines on basal half, hind ones paler at base and with whitish spots on apical half; tibiæ and tarsi blackish, the apical half of tibiæ with three pale rings. Joint 1 of antennæ slender, linear, black, flecked with whitish; 2 with base black, a narrow white band behind middle. Length, 7 mm.

Known only from Quinze Lake, Quebec. Type in Van Duzee collection.

689 (—). *PHYTOCORIS CONSPURCATUS* Knight, 1920, 61.

Elongate, slender. Dull grayish-yellow mottled with fuscous and blackish spots and dots, and thickly clothed with black deciduous scale-like hairs, intermixed with small patches of yellowish floccose ones; corium with a triangular pale spot adjoining base of cuneus; membrane thickly flecked with dark fuscous spots; femora blackish with numerous white spots, the hind ones with two interrupted pale rings on apical half; tibiæ annulated with fuscous and pale; ventrals dark fuscous to blackish, the basal ones somewhat paler. Joint 1 of antennæ black, flecked with white, beset with numerous pale setæ, about four-fifths as long as pronotum; 2 black with a pale ring at base and another at middle, slightly more than twice as long as 1; 3 pale at base and again at middle, three-fifths the length of 2; 4 black, three-fourths the length of 3. Male with a long tubercle above base of left clasper, as shown in fig. 16. Length, 5.8—6 mm.

St. Anthony Park, Minn., Aug. 5 (*Minn. Univ. Coll.*). Ranges from Ontario and New England west to Michigan and South Dakota. Occurs from June to September on the bark of maple, linden and pear.

690 (—). *PHYTOCORIS DAVISI* Knight, 1923, 624.

Head dull white with a band across front and a line behind each eye, blackish; pronotum with side margins broadly black, calli, center of disk and collar in great part, pale brownish-yellow, hind margin narrowly

pale, preceded by a transverse row of black spots; scutellum yellowish tinged with fuscous and with a vague paler median line; clavus fuscous, its margin paler; corium dull yellow, its inner apical angle blackish, outer one paler; embolium blackish alternated with white spots; cuneus pale, apex and spot on middle of inner margin black; upper surface clothed with pale silky pubescence, intermixed with short black hairs; legs dull yellow, apical halves of femora with large black spots, front and middle tibiæ each with three black rings; hind tibiæ mottled with fuscous; ventrals yellowish-white, with pale pubescence. Joint 1 of antennæ black with a few pale spots, one and three-fourths times the length of pronotum; 2 black with a broad pale band at base and another at middle, nearly twice as long as 1; 3 blackish, paler at base and in front of middle, three-fifths as long as 2; 4 fuscous, two-thirds the length of 3. Length, 6.3 mm.

Known only from Long Island, N. Y., and Lakehurst, N. J.

691 (927). *PHYTOCORIS MINUTULUS* Reuter, 1909, 24.

Elongate, slender, subparallel. Brownish-yellow to fuscous, clothed with yellowish silken pubescence intermixed with short black hairs; basal edge of pronotum whitish preceded by dark fuscous; scutellum with a small fuscous dot each side near apex; elytra chiefly pale fuscous, flecked with minute spots of pale pubescence; clavus often paler on sides, corium with outer margin and anal ridge pale; embolium with small pale spots; cuneus with apex, spots on base and near middle of inner margin blackish; membrane flecked with fuscous and with two paler spots on outer margin, veins brownish; femora brownish-black, their base, numerous spots and subapical band paler; tibiæ fuscous, each with two or more pale rings; tarsi pale, their tips and basal segment dusky. Joint 1 of antennæ two-thirds longer than pronotum, reddish-brown flecked with paler, and beset with several pale setæ; 2 brownish-yellow, darker at tip and in front of basal pale ring, nearly twice as long as 1; 3 and 4 very slender, 3 pale at base, darker apically, two-thirds the length of 2; 4 pale fuscous, but little shorter than 3. Length, 5—5.5 mm.

Chautauqua, N. Y., Sept. 14 (*Van Duzee*). Known only from Massachusetts, Connecticut, New York and Maryland.

692 (—). *PHYTOCORIS JUNCEUS* Knight, 1923, 621.

Head shining black beset with prominent brownish-black hairs, median line pale, vertex alutaceous each side; color of pronotum as in key; scutellum black, basal angles whitish; clavus dull yellow, its margins and claval vein black; corium black, a spot on middle and some streaks on inner apical half yellowish; embolium a uniform fuscous; cuneus black, paler on base; membrane dark fuscous, its middle paler with numerous more or less coalescent fuscous spots; ventrals brownish-black; femora blackish with pale spots, hind pair with an irregular pale subapical yellowish bar. Antennæ fuscous to black, joint 1 flecked with pale spots, finely pubescent and with several black setæ, but slightly longer than pronotum; 2 slender, cylindrical, two and three-fifth times as long as 1; 3 two-thirds the length of 2, twice as long as 4. Length, 8.5—9.2 mm.

Recorded only from Mt. Washington, N. Hamp., and Nordegg, Alberta.

693 (932). *PHYTOCORIS FENESTRATUS* Reuter, 1909, 24.

Elongate, slender, subparallel. Pale reddish-brown flecked with dull yellow; above thickly clothed with long yellowish prostrate hairs, intermixed with suberect blackish ones; scutellum with a large shining yellowish spot each side; corium with an elongate yellow spot near base, a larger one at middle and a smaller oval one near outer apical angle; embolium with numerous small yellow spots; cuneus yellowish at base; membrane with cells and apex fuscous, middle paler with numerous fuscous spots, veins reddish; prosternum, coxæ and middle of ventrals, yellow, remainder of under surface reddish-brown; femora yellow with numerous dull red dots. Joint 1 of antennæ as long as pronotum, dull yellow, rather thickly beset with short blackish hairs; 2 fuscous-brown, its extreme base paler, two and one-third times as long as 1; 3 and 4 fuscous brown, 3 three-fifths as long as 2, twice the length of 4. Length, 7—7.8 mm.

Clayton, Ga., May 18, beaten from pine (*Cornell Univ. Coll.*). Recorded elsewhere only from Connecticut, Washington, D. C., and North Carolina. The long slender form with antennals 2—4 fuscous-brown and without pale rings, except at base of 2, three yellow spots on corium and tibiæ devoid of pale rings, distinguish this species from its allies.

694 (—). *PHYTOCORIS CORTICEVIVENS* Knight, 1920, 63.

Elongate-oval. Head grayish-yellow with reticulate marks on vertex and several cross-bars each side of front, fuscous; pronotum in great part fuscous-brown, more distinctly so along basal margin, calli and middle of disk often paler; scutellum and elytra dull grayish-yellow with numerous vague irregular fuscous marks; embolium with numerous rather distinct cross-bars and tip of cuneus fuscous; membrane dull yellow, thickly flecked with fuscous dots, except on margins beyond tip of cuneus; femora fuscous-brown, narrowly pale at base, often with scattered pale dots; hind ones with a distinct oblique pale preapical ring; under surface fuscous-brown; lower half of head blackish, a pale spot at base of loræ. Antennæ fuscous-brown, with pale rings as in key, joint 1 three-fourths as long as head and pronotum united; 2 two and a half times as long as 1, 3 one-half as long as 2, 4 two-thirds the length of 3. Upper surface rather thickly clothed with short, prostrate yellowish hairs. Male genitalia as in fig. 6. Length, 6.5—7 mm.

Ramsey Co., Minn., June 2 (*Minn. Univ. Coll.*). Ranges from Quebec and New England west to Minnesota and southwest to Maryland; occurring in June and July in the crevices of the bark of sugar maple, *Acer saccharum* Marsh.

695 (937). PHYTOCORIS VITTATUS Reuter, 1909, 28.

Head dull yellow or pale fuscous with front obliquely marked with brown lines, both it and entire upper surface except membrane clothed with white sericeous scale-like pubescence; pronotum dull yellow to grayish, its sides fuscous with a sinuate black line next the pale outer edge, the pubescence of disk forming three pale stripes; scutellum fuscous with basal angles and side margins paler; clavus fuscous, paler along commissure; corium as in key; embolium pale yellow, its apex blackish; cuneus fuscous, its apex and inner margin blackish; membrane brownish-fuscous, its middle flecked with pale spots; middle and hind femora blackish, paler at base, the hind ones flecked with white dots; front tibiæ blackish with two pale rings. Joint 1 of antennæ reddish-fuscous marked with white spots, its length as in key; 2 fuscous with pale spots near base and a pale ring at middle, one and two-fifths times as long as 1; 3 fuscous with pale ring at base, as long as 1. Beak reaching fifth ventral.

Known only from Lake Placid, N. Y.

696 (—). PHYTOCORIS DIMIDIATUS Kirschbaum, 1855, 199, 282.

Grayish-yellow clothed with short yellowish and blackish pubescence; head brownish-yellow, its front with oblique brownish lines each side and cheeks with a black spot at base; pronotum dull greenish-yellow, hind margin pale; median line behind calli and narrow side and subbasal margins blackish; scutellum brown, basal angles and subapical spot each side darker, median line and tip pale; elytra blackish, the base and middle of corium and inner margins of clavus paler, embolium pale, with black spots; cuneus yellowish with apex and spots on inner margin blackish; membrane pale, irregularly and thickly flecked with fuscous, the base of large cell black; hind femora black with numerous spots and subapical band pale; tibiæ black with pale rings. Joint 1 of antennæ about one-third longer than pronotum, brownish black with numerous pale glabrous spots; 2 nearly twice as long as 1, blackish with pale ring at base and another slightly beyond middle; 3 black, pale at base, three-fifths the length of 2; 4 black, two-thirds as long as 3. Length, 6.4—7 mm.

A European species known in this country only from Nova Scotia.

697 (—). PHYTOCORIS SULCATUS Knight, 1920, 64.

Elongate-oval. Dull brownish-yellow, more or less tinged with fuscous; pubescent as in *fumatus*; outer half of clavus, inner half or less of corium and inner half of cuneus fuscous or blackish; femora pale at base, their apical halves flecked with large pale spots. Joint 1 of antennæ blackish with pale dots, as long as pronotum; 2 with distinct pale annulations at base and middle, twice as long as 1; 3 brownish-yellow, with a narrow pale ring at base, two-thirds as long as 2; 4 yellowish, two-fifths the length of 3. Male genitalia as in fig. 15; a large thick tubercle above base of left clasper. Length, 6 mm.

St. Anthony Park, Minn., Aug. 5 (*Minn. Univ. Coll.*). Ranges from New England west to Minnesota. Occurs on the bark of linden and bur oak.

698 (938). *PHYTOCORIS FUMATUS* Reuter, 1909, 25.

Grayish-fuscous clothed with short subappressed blackish hairs and with scattered spots of longer whitish ones; vertex with a large alutaceous spot each side, front with oblique lines each side and a bar between bases of antennæ, reddish or blackish; pronotum fuscous-brown, calli paler, narrow basal margin pale, preceded by a transverse row of four or six small blackish pilose spots; scutellum fuscous-brown with apex pale, basal angles, and a subapical spot each side, blackish; elytra fuscous to blackish, corium with a rhomboid translucent yellowish spot near inner apical angle, this preceded by an oblique black bar; membrane pale, thickly and rather evenly flecked with brownish-fuscous spots, the apex and a spot near tip of cuneus pale; under surface blackish, paler at middle, coxæ yellow; femora pale at base, their apical halves blackish with pale spots, front and middle tibiæ dull yellow, annulate near knees

with black, hind ones black, the middle third pale, tarsi fuscous. Antennæ blackish-brown joint 1 as long as pronotum and half of head, its upper face with pale spots; 2 almost twice the length of 1, its extreme base and often a spot near middle pale; 3 pale at base, about three-fifths as long as 2; 4 nearly one-third shorter than 3. Male genitalia as in fig. 8. Length, 7—7.6 mm.

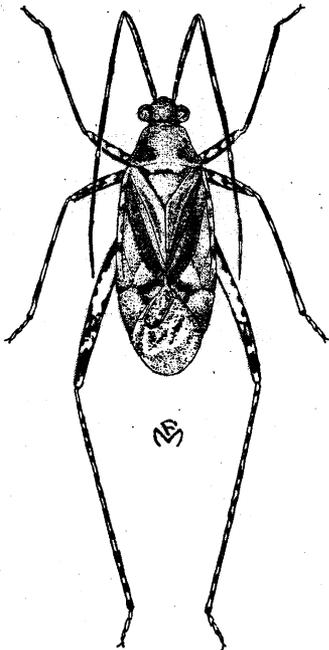


Fig. 168. *Phytocoris tuberculatus* Knight., X 5. (Original).

Sherborn, Mass., Sept. 6 (*Frost*). Ranges from Massachusetts and New York southwest to Washington, D. C. Knight (1920, 64) states that the type of *Phytocoris subnitidulus* Reut. (1909, 26) in the U. S. National Museum is identical with that of *P. fumatus* Reut., the latter name having page priority.

699 (—). *PHYTOCORIS TUBERCULATUS* Knight, 1920, 64.

Brownish-yellow, more or less thickly mottled with fuscous; disk of pronotum with some vague spots and a distinct zig-zag transverse line just in front of hind margin, fuscous, edge of hind margin white; clavus, inner half of corium, and apical half of cuneus clouded with fuscous;

membrane dusky with numerous minute white dots; basal joint of antennæ and apical three-fourths of femora fuscous, thickly flecked with small yellow spots; tibiæ and second antennal annulate with pale yellow and fuscous; lower part of face, middle of prosternum and basal third of femora ivory-white. Joint 1 of antennæ equal in length to distance be-

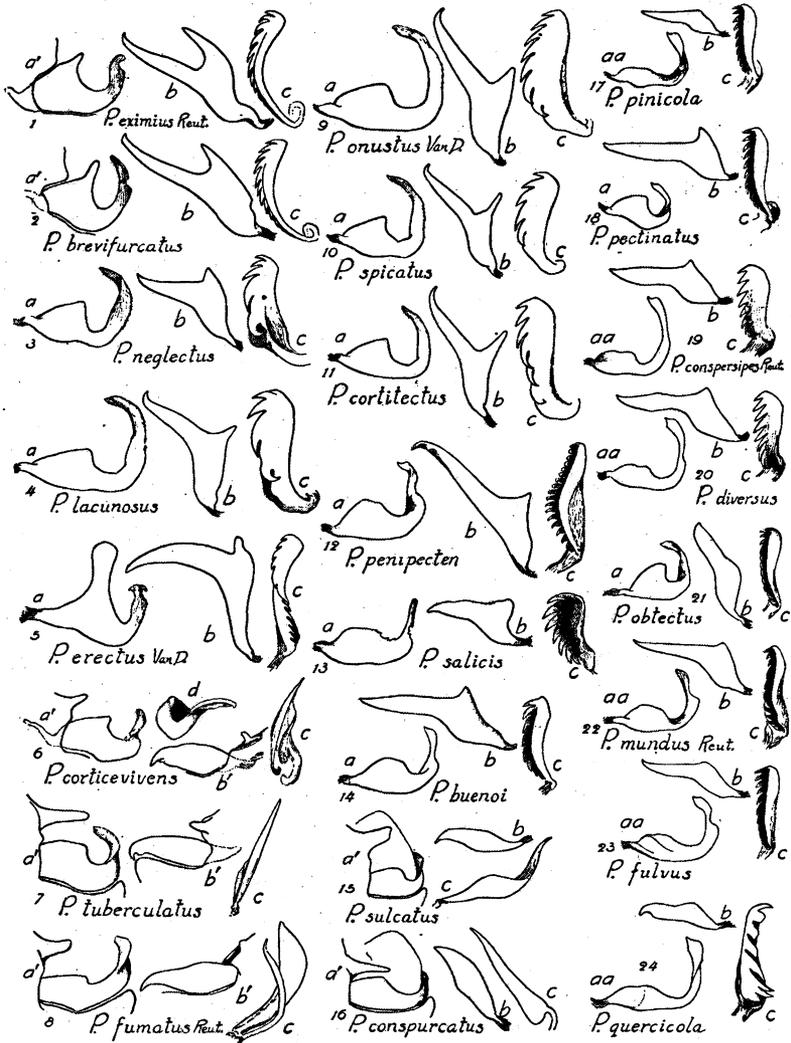


Plate XI. MALE GENITALIA OF SPECIES OF PHYTOCORIS.

a, Left clasper, side view; aa, left clasper, dorsal view; b, right clasper, side view; c, flagellum; d, left clasper, caudal view.

(After Knight, Hemiptera of Connecticut).

tween base of pronotum and a line drawn through middle of eyes, 2 twice the length of 1, 3 two-thirds the length of 2, one-third longer than 4. Disk of pronotum finely and sparsely granulate. Male genitalia as in fig. 7. Length, 6.5—7.5 mm. (Fig. 168).

Marion Co., Ind., June 14—Aug. 19, swept from herbage in dense woodland. Recorded from New York, Michigan and North Carolina.

GROUP II.—PHYTOCORIS.

In this group the membrane is wholly pale or dusky translucent without distinct spots or dots, and the basal joint of antennæ is shorter than the width of head across the eyes. It corresponds to the Group III of Knight in the "Hemiptera of Connecticut," and comprises eight of our eastern species. They average smaller than those of Group I and for the most part breed on pine.

KEY TO EASTERN SPECIES OF GROUP II, PHYTOCORIS.

- a. Elytra a nearly uniform pale reddish or reddish-yellow; embolium and cuneus yellowish-translucent; length, 4.2—4.7 mm.
 - 700. MUNDUS.
- aa. Elytra not uniformly reddish-yellow.
 - b. Elytra pale yellow to fulvous; clavus not darker than corium.
 - c. Femora with pale spots very small or subobsolete; color pale yellowish, the outer half of clavus and inner half of corium reddish-yellow; cuneus yellowish-translucent, reddish-yellow toward apex; length, 5.5—6 mm.
 - 701. FULVUS.
 - cc. Femora with distinct pale spots, but if not, then inner half of cuneus distinctly rosaceous.
 - d. Scutellum almost wholly yellowish to reddish, never distinctly paler on median line or apex.
 - e. Upper surface in great part rosaceous, outer half of corium pale translucent; smaller, length not more than 4.5 mm.
 - 702. RUFUS.
 - ee. Upper surface in great part a pale yellowish-brown, the base of cuneus sometimes tinged with reddish; larger, length, 5.2 or more mm.
 - f. Second antennal distinctly darker near apex; width of vertex in male greater than longer diameter of eye.
 - 703. UNIFORMIS.
 - ff. Second antennal a uniform pale brown; width of vertex in male distinctly less than longer diameter of eye. 704. MEGALOPSIS.
 - dd. Scutellum reddish-yellow each side of middle, its median line and apex distinctly paler; clavus and inner half of corium reddish or reddish-brown; cuneus with inner half rosaceous.
 - 705. DIVERSUS.

bb. Elytra more nearly brown or fuscous than yellowish, irregularly tinged with reddish; clavus darker than outer portion of corium.

g. Hind femora fusco-reddish, flecked with distinct small whitish spots, these never forming a distinct subapical band.

706. CONSPERSIPES.

gg. Hind femora fuscous with small yellowish spots, the dorsal surface with a rather broad subapical band or transverse pale spot.

707. PINICOLA.

700 (958). PHYTOCORIS MUNDUS Reuter, 1909, 18.

Elongate-oblong, subparallel. Color a nearly uniform pale dull yellow, more or less tinged with reddish, rather thickly clothed with fine silken yellowish appressed pubescence; embolium and disk of cuneus pale yellow, the margins of cuneus reddish; membrane pale dusky translucent, its veins yellowish; tarsal claws, tip of beak, apical two-thirds of second antennal and all of third and fourth antennals fuscous. Joint 1 of antennæ about as long as pronotum behind the collar, 2 nearly three times as long as 1, 3 about two-fifths shorter than 2, one-fifth longer than 4. Male genitalia as in fig. 22. Length, 4.2—4.7 mm.

District of Columbia, June 25—July 6 (*Gerhard*). Recorded only from there, New Jersey and Maryland. Breeds on the Jersey or scrub pine, *Pinus virginiana* Mill.

701 (—). PHYTOCORIS FULVUS Knight, 1920, 59.

Larger, more elongate and somewhat paler than *mundus*. Color as in key; apex of second antennal fuscous, third and fourth wholly blackish; membrane a uniform pale translucent with a faint dusky tinge. Male genitalia as in fig. 23. Length, 5.5—6 mm.

Wanakena, N. Y., Aug. 1—7 (*Gerhard*). Pineland, Long Island, N. Y., Aug. 11 (*Davis*). Recorded only from Maine and New York. Occurs on the white pine, *Pinus strobus* L.

702 (957). PHYTOCORIS RUFUS Van Duzee, 1912a, 477.

Elongate-oval. General color rosaceous on a pale yellow background, sparsely clothed with suberect brownish hairs; vertex and front yellow with red markings; pronotum with disk dull yellow, basal submargin with a transverse dusky line, the hind edge paler; scutellum with a few small vague yellowish spots; embolium and basal half of cuneus yellowish translucent, the costal edge with red markings; membrane a uniform pale dusky hyaline; legs and first antennal in great part dark reddish, mottled with yellow, remainder of antennæ fuscous-brown, the extreme base of segments 2 and 3 pale; basal third of femora and coxæ yellow; ventrals pale brown tinged with reddish. Joint 1 of antennæ about as long as width of vertex and one eye; 2 three times longer than 1, 3 two-fifths as long as 2; 4 slightly shorter. Length, 4.3—4.5 mm.

Dunedin, Fla., Jan. 17; beaten from foliage of bay. The types were from Sevenoaks, near Clearwater, Fla., and were

"swept from coarse grasses in a swampy opening in the pine forest." Not recorded elsewhere.

703 (—). *PHYTOCORIS UNIFORMIS* Knight, 1923, 643.

Elongate-oblong. Uniform pale brownish-yellow, rather thickly clothed with golden-yellow recumbent pubescence, intermixed with suberect pale brown hairs, eyes pale brown; femora and first antennal pale yellow, rather thickly flecked with reddish-brown spots and dots; second antennal greenish-yellow, fuscous toward apex; membrane uniformly pale dusky translucent; hind femora with a large yellow spot or ring on apical fourth. Basal joint of antennæ four-fifths as long as width of head, 2 two and two-fifths longer than 1, apical segments missing. Length, 5.2—5.5 mm.

Long Island, N. Y., Sept. 8 (*Davis*). Rocky Mountain, N. Car., Aug. 25 (*Brimley*). Recorded only from Massachusetts and New York.

704 (—). *PHYTOCORIS MEGALOPSIS* sp. nov.

Elongate, subparallel. Color above a nearly uniform fuscous-brown, thickly clothed with fine whitish appressed silky hairs and suberect dusky ones; vertex and lower half of face dull yellow; loræ tinged with reddish; eyes deep black, very large in male; collar and hind edge of pronotum whitish; costal margins of elytra and cuneus with alternate minute fuscous and white spots; inner margin of cuneus with two submedian black dots; membrane pale translucent with an iridescent sheen; femora and joint 1 of antennæ dull yellow, thickly flecked with reddish-brown spots and dots, third and fourth antennals fuscous, the former with extreme base pale; tip of beak, tarsal claws and tibial spines fuscous-brown; under surface pale reddish-brown, middle of prosternum and front coxæ ivory-white. Joint 1 of antennæ as long as width of vertex and one eye, 2 three and a half times as long as 1, 3 two-fifths the length of 2, one-third longer than 4. Sides of elytra straight and parallel to base of cuneus, thence feebly converging into the conjointly broadly rounded tips. Length to end of membrane, 5.5 mm.

Dunedin, Fla., April 20, one male taken at electric light. Due to the very large eyes the width of interocular area is but slightly more than one-half that of *uniformis*. The large coal-black eyes, uniform hue of second antennal and alternate maculation of costal margin easily separate this from the other members of Group II.

705 (—). *PHYTOCORIS DIVERSUS* Knight, 1920, 60.

Elongate, subparallel, more slender than *consersipes*. Head, pronotum and under surface greenish-yellow, the sides of tylus, margins of cheeks, oblique striæ on front, sternum and sides of ventrals usually tinged with reddish-brown; femora and tibiæ reddish-brown, mottled with paler. Joint 1 of antennæ greenish-yellow tinged with brownish, mottled with paler on inner side, one-fourth shorter than width of head;

2 fuscous, paler at base, nearly three times as long as 1; 3 and 4 blackish, 3 one-half the length of 2, one-fourth longer than 4. Male genitalia as in fig. 20. Length, 5 mm.

Carlton Co., Minn., Aug. 18 (*Minn. Univ. Coll.*). Occurs on white pine, its known range extending from Maine to Minnesota.

706 (954). *PHYTOCORIS CONSPERSIPES* Reuter, 1909, 22.

Elongate-oblong, subparallel. Head and pronotum dull yellow, the former thickly flecked with small reddish spots, the latter with a reddish tinge and beset with numerous suberect black hairs; scutellum and elytra rather dark reddish-brown, the former with yellowish tip, the latter with widely scattered small vague yellowish spots, both rather thickly clothed with fine appressed yellowish pubescence; membrane of a uniform dusky hue throughout; femora and basal antennal dark reddish flecked with numerous small yellow dots, remainder of antennæ fuscous-brown; joints 2 and 3 narrowly pale at base; tarsi more or less fuscous; basal joint of beak with a red line each side. Joint 1 of antennæ three-fourths the length of pronotum, 2 nearly three times the length of 1, 3 one-half the length of 2, but slightly longer than 4. Male genitalia as in fig. 19. Length, 4.7—5 mm.

Reading, Pa., and Rock Creek, D. C., June 22—Aug. 14 (*Gerhard*). Swannanoa, N. Car. (*Brimley*). Heretofore recorded only from New Jersey, Maryland and District of Columbia. Breeds on the scrub pine, *Pinus virginiana* Mill.

707 (—). *PHYTOCORIS PINICOLA* Knight, 1920, 59.

Elongate-oval. Head and pronotum greenish-yellow tinged with reddish-brown; scutellum, clavus and corium pale reddish-fuscous; embolium and cuneus dull greenish-yellow with a reddish tinge; femora and tibiæ fuscous-brown, thickly flecked with minute yellowish dots. Joint 1 of antennæ brownish, annulate or marked above with paler glabrous spots, its length less than three-fifths the width of head; 2 fuscous-brown, paler beneath, nearly three and two-third times as long as 1; 3 blackish, narrowly pale at base, about as long as width of head; 4 blackish, slightly more than half the length of 3. Male genitalia as in fig. 17. Length, 5.2 mm.

Ithaca, N. Y., July 11 (*Minn. Univ. Coll.*). Recorded only from Massachusetts and New York. Breeds on the gray and red pines, *Pinus silvestris* L. and *P. resinosa* Ait.

GROUP III.—PHYTOCORIS.

This group includes species of small or medium size having the membrane unflecked though sometimes with pale areas near middle, and the antennæ in great part blackish or fuscous

with basal joint longer than greatest width of head. It corresponds to Group II of Knight in the "Hemiptera of Connecticut," and comprises 20 of our eastern species.

KEY TO EASTERN SPECIES OF GROUP III, PHYTOCORIS.

- a. Vertex with a shallow but distinct median longitudinal impression; joint 1 of antennæ stout, twice as thick throughout as 2; form very slender.
- b. Corium with a conspicuous round white spot near apex. 708. BIPUNCTATUS.
- bb. Corium without a white spot near apex. 709. ANNULICORNIS.
- aa. Vertex without a median longitudinal impression; joint 1 of antennæ never twice as thick as joint 2; form more robust.
- c. Corium with a distinct black or dark fuscous mark extending obliquely from radius to the inner apical angle of corium, this dark mark never broken by paler spots.
- d. Disk of pronotum uniformly deep black with only the narrow basal margin pale; scutellum yellowish with an oblique black mark near middle each side of median line; length, 5.1 mm. 710. NIGRICOLLIS.
- dd. Disk of pronotum pale grayish to blackish, always paler on middle and never deep black.
- e. Scutellum with distinct blackish mark each side of apical half which extends from the side margin forward to near middle of scutellar disk.
- f. Pale color on lower margin of propleura extending upon sides of sternum.
- g. Tylus in great part blackish; femora black except at base, their pale spots small, the largest on hind femora not wider than the narrow pale band at apical fourth; length 5.1 mm. 711. HUSSEYI.
- gg. Tylus wholly pale; hind femora in great part pale, the apical fourth and some scattered spots fuscous-brown enclosing pale dots; length, 6 mm. 712. ALBITYLUS.
- ff. Pale color on lower margins of propleura not extending upon sides of sternum.
- h. Hind femora with large irregular pale spots on front face, the spots connected by a longitudinal pale bar which does not reaching subapical pale band; length, 7—7.4 mm. 713. ONUSTUS.
- hh. Hind femora with small spots and without a distinct longitudinal bar on front face.
- i. Membrane with the infuscation on its central area tending to separate into small specks; front of head transversely striate with black lines each side of median line; length, 6.2 mm. 714. NEGLECTUS.
- ii. Membrane more uniformly dusky, its central area without specks; front of head not distinctly striate with black, though reddish or fuscous lines sometimes evident; length, 6—6.8 mm. 715. SPICATUS.

- ee.* Scutellum with black spot on margin each side of apical half, but this scarcely longer than broad, not reaching more than half way to middle of disk; length, 5.4—5.9 mm.
- j.* Hind femora with a distinct white band near apical fourth and usually with large pale spots near middle.
- k.* Second antennal pale or yellowish above, darker near apex and next to pale ring at base; scutellum and clavus clothed with suberect yellowish or fuscous hairs intermingled with short sericeous white pubescence; center of membrane somewhat fuscous. 716. EXIMIUS.
- kk.* Second antennal dark brown or black except at base; pronotum, scutellum and clavus clothed with black hairs, intermixed with conspicuous white sericeous pubescence. 717. BUENOL.
- jj.* Hind femora without a distinct white band near apical fourth, the pale spots near middle small.
- l.* Corium with conspicuous triangular black mark set obliquely across its apex; cuneus usually reddish. 718. ERECTUS.
- ll.* Corium with a light, almost interrupted fuscous mark set obliquely across its apex; cuneus rarely if ever reddish. 720. BREVIFURCATUS.
- cc.* Corium without a distinct black mark across its apical area, this area sometimes fuscous but the dark color broken by paler spots, but if not, the black color on radius distinctly darker than the oblique infuscation.
- m.* Corium distinctly greenish on apical half; second antennal black with pale ring at base.
- n.* Length, 5.1—5.5 mm. 721. PENIPECTUS.
- nn.* Length, 4.8 mm. 722. PECTINATUS.
- mm.* Corium not distinctly green.
- o.* Elytra more brownish than black; dark color on middle of clavus and apical area of corium broken into small spots; pubescence chiefly golden-brown; length, 6 mm. 723. SALICIS.
- oo.* Elytra sometimes brownish but the dark color not broken into small spots.
- p.* Front and vertex pale to yellowish, not distinctly marked with blackish, rarely with short red lines near each eye; scutellum pale to yellowish with a small submarginal brown or fuscous spot each side near apical fourth; length, 6.2 mm. 724. ANGUSTULUS.
- pp.* Front and vertex transversely marked with blackish lines.
- q.* Scutellum chiefly brownish-black, irregularly spotted with paler, its median line narrowly pale but irregularly invaded with the darker color; length, 5.5 mm. 725. OBTECTUS.
- qq.* Scutellum chiefly pale to grayish but with a black mark each side on apical half.
- r.* Corium with a longitudinal pale area which extends upon base of cuneus without interruption by an oblique infuscation; radius with a black line which curves outward apically to the base of cuneus; length, 6.7 mm. 726. LACUNOSUS.

rr. Corium distinctly darkened with fuscous on apical half, scarcely showing paler by contrast with dark marks along radius; length, 6 mm. 727. CORTIRECTUS.

708 (929). PHYTOCORIS BIPUNCTATUS Van Duzee, 1910, 77.

Elongate, very slender, subparallel. Head fuscous-brown with a reddish tinge, the tylus paler; pronotum with apical half reddish-brown, basal half fuscous-brown, its extreme hind margin with a sinuate white line interrupted by small tufts of short black hairs; scutellum reddish-brown, vaguely flecked with yellow; elytra fuscous-brown, the costal margin with small alternate gray and fuscous spots; corium with pale spot near apex; membrane uniformly dusky, feebly iridescent; femora fuscous-brown, reddish-yellow at base, front tibiæ reddish-brown, with three conspicuous pale yellow rings; ventrals fuscous, pro- and mesosterna dull yellow with a reddish tinge. Antennæ longer than body, joint 1 dark brown with two or three yellow spots, slightly shorter than basal width of pronotum; 2 dark brown with two pale rings, twice the length of 1; 3 two-thirds the length of 2, pale, with brown pale ring at base and another near middle; 4 very slender, fuscous, slightly shorter than 1. Length, 4.2—4.7 mm.

Dunedin and Kissimmee, Fla., Dec. 19—April 1. Taken in spring by sweeping grasses and herbage in pine woods and along margins of ponds; hibernates in winter beneath boards and other cover near ponds. Described from Florida and, according to Van Duzee: "Common on the dry sparse grasses in the pine barrens everywhere south of Sanford."

709 (930). PHYTOCORIS ANNULICORNIS (Reuter), 1876, 70.

Form and size of *bipunctatus*. Reddish-brown tinged with fuscous; joints 1 and 2 of antennæ reddish-fuscous, 1 with numerous pale spots, 2 with two pale rings; 3 and 4 testaceous, 3 with two paler rings; under surface fuscous, sterna and legs reddish-brown, the femora fuscous towards apex; tibiæ with three fuscous rings, those on hind tibiæ more or less confluent. Length, 5 mm.

Described from Texas. Recorded by Parshley from Maine and Massachusetts, and by others from Pennsylvania, Ohio, Colorado and California. Knight (Ms.) considers *bipunctatus* a synonym of *annulicornis*, but neither Reuter nor Distant in their descriptions of *annulicornis* mention the prominent pale spot on corium, distinctive of *bipunctatus*.

710 (—). PHYTOCORIS NIGRICOLLIS Knight, 1923, 636.

Male—Elongate, subparallel. Head dull yellow; apical half of tylus, loræ except tips, bucculæ and mark behind eye blackish; color of pronotum and scutellum as in key, both they and elytra clothed with

black hairs intermixed with tufts of silky yellowish pubescence; clavus yellowish, fuscous at middle; corium black, the base, spot at middle and another near base of cuneus, pale; embolium black with spots near base and middle, pale; cuneus yellowish, apex and inner margin black; membrane blackish, a small spot near tip of cuneus and another at apex of larger cell, white; femora black flecked with yellowish, their bases pale; front and middle tibiæ pale, annulate with black, hind ones black with broad pale ring on basal third; ventrals deep black, the basal ones yellowish at middle. Joint 1 of antennæ dull yellow, above black with yellow spots, as long as pronotum; 2 and 3 black with pale ring at base, 2 two and three-fifths times as long as 1, nearly twice the length of 3; 4 black, one-fifth shorter than 3. Beak reaching fifth ventral. *Female*—With costal margins more curved, elytra more broadly pale; antennal joints relatively longer. Length, 5—5.2 mm.

Recorded only from New Hampshire and North Carolina, but probably has a much wider range.

711 (—). *PHYTOCORIS HUSSEYI* Knight, 1923, 639.

Elongate, subparallel. Head yellowish with reddish to black marks on front, tylus and loræ; pronotum and scutellum yellowish marked with darker as in key; clavus blackish with paler brown or fuscous spots; corium with apical third fuscous, black spot opposite base of membrane and a pale one that of cuneus, both corium and clavus clothed with short erect black hairs intermixed with tufts of whitish silken tomentose pubescence; membrane fuscous, darker at base; hind femora with a narrow subapical pale ring. Joint 1 of antennæ black, flecked above with large and small whitish spots, about one-fifth longer than width of head across eyes, 2 and 3 black, pale at base, 2 twice as long as 1, two-thirds longer than 3; 4 black, as long as 1. Beak reaching fourth ventral. Length, 5.1 mm.

Known only from Mercer County, Ohio.

712 (—). *PHYTOCORIS ALBITYLUS* Knight Ms.

Elongate, subparallel. Head dull whitish-yellow; loræ and a few vague marks on vertex fuscous; pronotum dull yellow, an impressed dot behind each callus and a narrow prebasal zigzag line fuscous-brown, basal margin narrowly whitish, propleuræ and middle of mesoscutum dull black; scutellum dull yellow with fuscous marks as in *e* of key; elytra dull yellow, clavus, claval suture and inner margin of corium in great part fuscous-brown; apex of corium with an oblique dark bar as in *c* of key; embolium fuscous, flecked with scattered pale dots; cuneus dull yellow, the tip and some small spots along inner margin fuscous; membrane fuscous-hyaline marbled with paler, the large cell with a few small fuscous dots; femora as in *gg* of key; tibiæ and tarsi fuscous, the former with two broad pale rings; under surface dull black, sterna straw-yellow. Joint 1 of antennæ blackish, with numerous large white dots, as long as pronotum; 2 and 3 blackish-brown, each narrowly pale at base, 2 twice as long as 1, 3 two-fifths the length of 2, 4 missing. Eyes of male very large, the interocular area only one-half their long diameter.

Pronotum two-thirds wider at base than long at middle, its basal half somewhat flaring. Length, 6 mm.

Dunedin, Fla., March 17. One male beaten from wax-myrtle, *Myrica cerifera* L.

713 (—). PHYTOCORIS ONUSTUS Van Duzee, 1920, 344.

Elongate, subparallel. Head dull yellow, cheeks, tip of tylus and six oblique lines each side of front, fuscous; pronotum with sides and basal third broadly blackish, the latter area interrupted at middle, hind margin whitish, in female preceded by a transverse row of six black spots; scutellum pale with stripe each side and basal angles blackish; elytra fuscous, vaguely irrorate with pale, the corium with polished paler areas at base, middle and near apex; cuneus fuscous; membrane pale fuscous, a pale spot near tip of cuneus and two vague ones on disk, veins fuscous; hind femora as in key; tibiæ fuscous with three or four pale rings. Antennæ fuscous, joint 1 flecked with paler, as long as pronotum and half of head; 2 paler at base, two and one-half times longer than 1; 3 with base and extreme tip pale, 3 and 4 united equal to 2; 3 longer than 1, 4 shorter. Beak passing hind coxæ. Male genitalia as in fig. 9. Length, 7—7.4 mm.

Ranges from New England west to New York. Occurs on bark of hickory in moist shaded localities.

714 (—). PHYTOCORIS NEGLECTUS Knight, 1920, 54.

Elongate, subparallel. Head dull yellow, vertex with reddish markings; apex of tylus and two or three short bars on cheeks and loræ fuscous-brown; pronotum dull yellow tinged with reddish, sparsely clothed with sub-erect fuscous hairs, hind margin pale yellow, this hue bordered in front by a transverse row of six or eight small oblong fuscous-brown spots; scutellum dull yellow with fuscous marks as in *e* of key; elytra fuscous-brown with scattered vague paler areas, embolium pale yellow with a few small dark spots, apical third of corium with an oblique fuscous bar as in *c* of key; membrane fuscous with paler areas near middle; legs straw-yellow, apical halves of femora flecked with fuscous, tibiæ thrice annulate with fuscous-brown; under surface pale yellow along median line, the sides with a wide dark brown unbroken stripe extending from behind eye to tip of abdomen. Joint 1 of antennæ pale yellow with numerous fuscous marks, subequal in length to width of pronotum at base; 2 and 3 uniformly blackish-fuscous, each narrowly pale at base; 2 more slender and two and a third times longer than 1, 3 one-half as long as 2, one-third longer than 4. Beak reaching third ventral. Male genitalia as in fig. 3. Length, 6.2—6.5 mm.

Woods Hole and Pigeon Cove, Mass., July 15—30 (*Olsen*). Ranges from New England west to Michigan and South Dakota. Occurs on the bark of apple and other trees where it is probably predaceous on the larvæ of various insects. Beaten from hazel by Hussey.

715 (—). *PHYTOCORIS SPICATUS* Knight, 1920, 55.

Elongate, subparallel. Head and middle of apical half of pronotum greenish-white, the former with vague narrow transverse fuscous or reddish lines between the eyes and two broader zigzag ones on front. Remainder of pronotum, clavus and corium dull fuscous-black with vague paler markings; scutellum greenish-yellow with an oblique black line each side of apical half; embolium dull yellow with black spots; cuneus with basal half greenish-yellow, apical half fuscous; femora greenish-yellow, their apical halves with black spots, hind ones with preapical pale ring; tibiæ annulate with fuscous and dull white; under surface greenish-white with a broad blackish stripe along each side. Joint 1 of antennæ blackish with white spots, three-fourths as long as head and pronotum united; 2 and 3 fuscous-brown, both narrowly pale at base, 2 two and one-half times as long as 1; 3 two-fifths the length of 2; 4 dusky, two-thirds as long as 3. Male genitalia as in fig. 10. Length, 6—6.8 mm.

Norman Co., Minn., June 25 (*Minn. Univ. Coll.*). Recorded from New England and New York.

716 (934). *PHYTOCORIS EXIMIUS* Reuter, 1876, 67.

Elongate, suboval. Dull greenish-yellow with numerous fuscous and reddish marks, thinly clothed with suberect pale or fuscous hairs and prostrate yellowish ones; head marked with numerous oblique blackish-lines and reddish dots; pronotum with middle of front lobe greenish-yellow marked with reddish, remainder of disk clouded with fuscous and with an undulate or interrupted fuscous line across basal fifth, this edged behind with paler; scutellum greenish-yellow, the extreme base and a short oblique spot each side near apex, fuscous; elytra with numerous small fuscous spots, the corium with a conspicuous oblique blackish bar across its apical fourth; tip of cuneus and cells of membrane fuscous; femora and second antennal colored as in key; tibiæ annulate with brown and yellow; under surface greenish-yellow with a broad black stripe on sides; genital area fuscous. Joint 1 of antennæ reddish-brown with paler dots, about one-third longer than pronotum; 2 more than twice as long as 1, 3 three-fifths the length of 2, slightly more than one-fourth longer than 4. Beak reaching fourth ventral. Male genitalia as in fig. 1. Length, 5.8—6.2 mm.

Marion Co., Ind., June 26—Sept. 2 (*W. S. B.*). Hessville, Lake Co., Ind., July 1; S. Maywood, Ill., Aug. 3 (*Gerhard*). Raleigh, N. Car., Sept. 27 (*Brimley*). Ranges from Quebec and New England west to the Pacific and southwest to Florida, Texas, Mexico and the West Indies. Recorded from Crescent City and Jacksonville, Fla. Variable to some extent in depth of color, according to habitat and maturity. Occurs mainly on grasses in waste places; also on foliage of ash and hickory, and said to be in part predaceous.

717 (—). *PHYTOCORIS BUENOI* Knight, 1920, 57.

"Resembles *eximius* but colors of dorsum more in contrast; front and middle femora dark fuscous-brown, closely and irregularly maculated with pale; black patch bordering cubitus strongly contrasted with the pale spot adjoining base of cuneus, pale part of cuneus tinged with roseous; central area of membrane distinctly pale. Male genitalia as in fig. 14, distinctive of the species. Length, 5.8 mm." (*Knight*).

New Haven, Conn., June 27 (*Walden*). Recorded from Massachusetts, Connecticut and New York. Occurs on Norway spruce.

718 (—). *PHYTOCORIS ERECTUS* Van Duzee, 1920, 345.

Elongate, subparallel. Dull greenish-yellow with fuscous-brown markings; scutellum with blackish marks as in *ee* of key; stripe on disk of clavus and another on corium along claval suture, fuscous; apex of corium with a conspicuous polished pale spot, preceded by a black mark as in *l* of key; cuneus with outer basal portion dull yellow, remainder reddish flecked with fuscous, its inner margin with two black points; membrane pale fuscous, with a double subhyaline pale mark behind apex of cuneus and another in the larger cell; hind femora as in *jj* of key, though often with a rather distinct pale subapical ring; under surface greenish-yellow, the sides and genital segment mostly black. Joint 1 of antennæ brown with pale dots, one-third longer than width of head across eyes; 2 brownish-yellow, narrowly pale at base, slightly more than twice as long as 1; 3 dusky yellow, pale at base, one-half the length of 2; 4 fuscous, four-fifths as long as 3. Genitalia of male as in fig. 5. Length, 5.4—6 mm.

Norman Co., Minn., July 17 (*Minn. Univ. Coll.*). Ranges from Ontario and New England west to Minnesota.

719 (—). *PHYTOCORIS CANADENSIS* Van Duzee, 1920, 346.

"Very close to *erectus*, but with distinct genital characters and the pale ventral area more widened posteriorly, covering the entire last ventral; genital segment fuscous each side, the median line and apex pale. Sinistral male clasper with its dorsal hook hardly half as long as in *erectus*, triangular as viewed from before and acute at apex; dextral clasper shorter, more slender on apical portion, its dorsal tooth much larger, acute, nearly parallel with the ventral member, than which it is one-half shorter." (*Van Duzee*).

Known only from a single male taken July 29 at Kearney, Ontario. Not included in key, as no tangible characters of sufficient importance are given in description.

720 (—). *PHYTOCORIS BREVIFURCATUS* Knight, 1920, 53.

"Very similar to *eximius* but without the heavy oblique fuscous mark at apex of corium; second antennal darker fuscous on the middle third; head and pronotum distinctly grayish green on the paler parts;

posterior femora with smaller irrorations, not distinctly banded with pale; genital claspers and flagellum of male as in fig. 2. Length, 5.8 mm." (*Knight*).

Known only from Batavia, N. Y., where it was taken in July and August on the bark of trees in shaded situations.

721 (—). *PHYTOCORIS PENIPECTUS* Knight, 1920, 58.

Head, front half of pronotum, scutellum and basal half of corium brownish-yellow with fuscous markings; basal half of pronotum tinged with olive-green and with a narrow zigzag fuscous cross-bar in front of the yellowish hind margin; clavus and apical half of corium olive-green mottled with fuscous; tips of embolium and cuneus fuscous; membrane fuscous, the middle and a spot near tip of cuneus greenish-hyaline, veins yellowish; legs greenish-yellow with fuscous markings as in *eximius*. Antennæ with relative length of joints as in *eximius*; joint 2 fuscous-brown with a pale ring at base. Male genitalia as in fig. 12. Length, 5.1—5.3 mm.

New Canaan, Conn., Sept. 14 (*Walden*). Recorded only from that State and Massachusetts.

722 (—). *PHYTOCORIS PECTINATUS* Knight, 1920, 58.

"Very similar to *eximius*, colored more as in *penipectus* but more strongly invaded with green on the corium, clavus and scutellum; second antennal black except at base. Genital claspers and flagellum of male as in fig. 18. Length, 4.8 mm." (*Knight*).

Known only from Florida, where it has been taken at Gainesville, May 9, and Silver Springs, Sept. 25.

723 (—). *PHYTOCORIS SALICIS* Knight, 1920, 56.

Elongate, suboval. General color dull brownish-yellow, rather thickly clothed with appressed yellowish hairs, with scattered darker ones intermixed; head with numerous reddish markings, those on sides of front forming oblique transverse lines; pronotum dull yellow, apical third with reddish markings, extreme basal edge pale yellow, preceded by a transverse row of small vague fuscous spots; scutellum often with a narrow median pale stripe; elytra with scattered small vague fuscous markings; embolium indistinctly alternated with dull yellow and fuscous; cuneus with outer basal angle yellowish, apical half with fuscous or reddish markings; membrane pale fuscous marbled with whitish; legs straw-yellow, front and middle femora thickly flecked with reddish-brown, hind ones with fuscous-brown; tibiæ with three brown rings, the basal ones often broken into spots; under surface dull greenish-yellow, the sides of pleura and sometimes of abdomen dark brown. Joint 1 of antennæ pale yellow, thickly flecked with reddish-brown, the apical fifth brown, about three-fourths as long as basal width of pronotum; 2 and 3 pale brown, both narrowly yellowish at base, 2 darker at tip and near the pale base, twice as long as 1; 3 two-fifths as long as 2. Beak reaching third ventral. Male genitalia as in fig. 13. Length, 6.2 mm.

Marion Co., Ind., June 26—July 10; beaten from willow. Dunedin, Fla., April 10—20; frequent on foliage of willow and bay along the margins of ponds. Pigeon Cove and Oak Bluff, Mass., July 29—Aug. 3 (*Olsen*). Ranges from Ontario and New England west to the Dakotas and south to Florida. Occurs mainly on black willow, and probably predaceous.

724 (931). *PHYTOCORIS ANGUSTULUS* Reuter, 1909, 29.

Elongate, subparallel. Head reddish-yellow with a spot at base of loræ blackish, tylus yellow; beak reaching sixth ventral, yellowish, its apex fuscous; pronotum grayish-yellow with lateral and basal submargins fuscous, calli and collar paler, edge of hind margin pale; elytra fuscous-brown, corium with three translucent yellowish spots, the largest triangular on apex and united with the pale center of cuneus, apex and inner margin of cuneus fuscous; membrane fuscous with a pale spot near apex of cuneus and a smaller one behind it; first antennal pale yellow with fuscous spots, second and third fuscous each with a narrow pale ring at base, fourth blackish; femora blackish-brown thickly sprinkled with small yellow spots, hind ones with an oblique pale band near apex; tibiæ annulate with brown and yellow; coxæ pale yellow; ventrals blackish. Joint 1 of antennæ one-fourth longer than pronotum, 2 more than twice as long as 1, and nearly twice as long as 3, 4 one-third shorter than 3. Length, 6—6.2 mm.

Black Mountains, N. Car., July 18 (*Brimley*). Described from West Virginia and recorded from New York, Vermont and Nova Scotia. Collected by Knight on the hemlock, *Tsuga canadensis* (L).

725 (—). *PHYTOCORIS OBTECTUS* Knight, 1920, 58.

"Very similar to *eximius*, slightly smaller and more slender, hemelytra more uniformly grayish translucent, not distinctly marked with fuscous at apex of corium; front transversely striate with fuscous; scutellum grayish-brown, irrorate with paler; genital claspers and flagellum of male as in fig. 21. Length, 5.5 mm." (*Knight*).

Recorded only from Honeoye Falls, N. Y.

726 (—). *PHYTOCORIS LACUNOSUS* Knight, 1920, 56.

"Very similar to *cortitectus* only larger; nearly the size of *onustus* but more slender and paler in color; corium with a longitudinal pale area extending onto base of cuneus without interruption at cubitus; flagellum and right genital clasper of male as in fig. 4. Length, 6.7 mm." (*Knight*).

Described from McLean, N. Y., where it was taken on the bark of water beech, *Carpinus caroliniana* Walt., growing at the margin of a bog. Recorded elsewhere only from North Dakota where it was found by Hussey on willow.

727 (—). PHYTOCORIS CORTITECTUS Knight, 1920, 55.

“Very similar to *eximius*; pale parts of hemelytra more translucent, infuscations paler; front of head transversely striate with fuscous each side of median line; second antennal more uniformly fuscous but with a pale reflection throughout the infuscation; genital claspers and flagellum of male as in fig. 11. Length, 6 mm.” (*Knight*).

Recorded only from Glen House, N. Hamp. and Batavia, N. Y., where it was found in late July in the crevices of the bark of elm.

GROUP IV.—PHYTOCORIS.

In this group the membrane is sometimes marbled but not flecked with pale spots, the antennæ are more pale than blackish with basal joint longer than width of head and the general color is usually yellowish to reddish over a paler background. It corresponds to Knight's Group IV and comprises twelve of our eastern species.

KEY TO EASTERN SPECIES OF GROUP IV, PHYTOCORIS.

- a. Disk of pronotum frequently in part or wholly red but without four distinct reddish stripes on a pale background.
- b. Pronotal disk with four to six black spots on basal submargin, these often vague or sometimes wanting; scutellum usually uniformly pale, rarely with a fuscous spot each side on apical half. 728. QUERCICOLA.
- bb. Pronotal disk without trace of black spots on basal submargin; scutellum usually with orange or red each side on apical half.
- c. Pronotum chiefly red, more red than pale or fuscous.
- d. Elytra with distinct yellowish dots or spots; calli darkened with fuscous. 729. CONFLUENS.
- dd. Elytra nearly a uniform deep orange-red without pale spots; calli wholly pale. 737. (male) PUELLA.
- cc. Pronotum with more pale or fuscous than red.
- e. Scutellum uniformly pale or bright yellow.
- f. Pronotum and elytra chiefly bright yellow, the former with an orange stripe projecting backward along outer margin of callus; scutellum bright yellow. 730. LUTEOLUS.
- ff. Pronotum and elytra pale brownish-yellow, the former without orange stripes; scutellum pale whitish yellow. 731. ANGUSTIFRONS.
- ee. Scutellum with an orange or reddish mark each side of median line.
- g. Disk of pronotum with basal and side margins dark fusco-reddish; scutellum yellow with a red mark each side on apical half but without a stripe at middle of base. 732. INFUSCATUS.

- gg.* Disk of pronotum chiefly pale, not darkened at base or on sides; base of scutellum with an orange colored stripe each side of median line, these frequently projected backward and uniting with an orange mark on each side of apical half. 733. OLSENI.
- aa.* Disk of pronotum with four orange or red stripes on a paler background.
- h.* Second antennal pale with a slender blackish line along its upper or front surface; embolium and outer half of corium green; clavus greenish to fuscous with a rather large irregular reddish blotch at middle and a smaller one on basal half. 734. TIBIALIS.
- hh.* Second antennal without a slender blackish line along its upper surface; embolium and outer half of corium marked with brown or reddish.
- i.* Apical half of corium with a large triangular yellow area just before cuneus; clavus, basal area of corium, embolium and cuneus bright red but flecked with paler spots. 735. VENUSTUS.
- ii.* Apical half of corium marked with reddish or if not, then its basal half without bright red.
- j.* Hind femora heavily marked with fuscous or red, the dark color inclosing small pale spots, the basal third pale; elytra dull yellow with dark red reticulations, more nearly fuscous-reddish on basal half of corium. 736. DEPICTUS.
- jj.* Hind femora chiefly pale marked with reddish only on apical half.
- k.* Dorsum pale, the elytra with orange or pale reddish reticulations; apical half of corium as distinctly marked as basal half; membrane pale, somewhat dusky at base.
- l.* Pronotum with a single transverse impression, the red stripes of disk not passing over calli to reach front margin. 737. (female) PUELLA.
- ll.* Pronotum with two transverse impressions, one behind and one in front of calli, the red stripes percurrent, passing over both of them onto collar. 738. RUBELLUS.
- kk.* Dorsum pale greenish-yellow, the elytra with fuscous reticulations; apical third of corium without dark marks; membrane pale fuscous, marbled with paler. 739. CARYÆ.
- 728 (—). PHYTOCORIS QUERCICOLA Knight, 1920, 60.

Elongate, subparallel. General color pale straw-yellow, more or less marked with reddish and fuscous, and thickly clothed with fine prostrate yellowish pubescence; head pale yellow with scattered red marks, front with conspicuous pale hairs; pronotum with collar and middle of apical third pale with a few red marks, remainder pale brownish-fuscous; elytra with numerous scattered reddish-brown reticulations, embolium and cuneus with red ones; membrane pale translucent, sometimes dusky marbled with paler; femora and first antennal pale yellow with numerous red or reddish-brown spots, remainder of antennæ pale brownish-yellow; tibiæ annulate with yellow and red, the hind ones less dis-

tinctly so; ventrals dull yellow with brownish or reddish spots on sides. Joint 1 of antennæ slightly longer than width of head, 2 more than twice as long as 1, 3 slightly more than one-half the length of 2, one-fourth longer than 4. Beak reaching sixth ventral. Male genitalia as in fig. 24. Length, 4.5—4.7 mm.

Ormond and Dunedin, Fla., Dec. 19—April 26 (*W. S. B.*). Long Island, N. Y., Aug. 17 (*Davis*). Taken at Dunedin in December from beneath boards on margin of pond; in spring by beating foliage of oak and bunches of Spanish moss hanging thereto. Recorded heretofore only from Massachusetts, New York and Maryland. Knight states that in the North it breeds on bur oak, *Quercus macrocarpa* Michx. The black spots on basal submargin of pronotum are formed by the interruption of the dark submarginal line as noted in *P. tuberculatus* Knight and other species of the genus, are variable in number and sometimes subobsolete. The membrane in northern specimens is often flecked with pale spots as plainly as in some of the species of Group I.

729 (951a). PHYTOCORIS CONFLUENS Reuter, 1909, 20.

Elongate-oblong. Head chiefly red, the tylus yellow; pronotum red, darker on calli and basal half, the middle of disk with some vague yellowish spots; scutellum red, basal angles and apex pale; elytra, including cuneus, dull red, distinctly mottled with yellow spots, corium often with a large pale spot at apex; membrane dusky with red veins; antennæ, front and middle legs and hind tibiæ pale yellow; hind femora red, paler at base usually rather thickly flecked with pale spots; ventrals yellow, more or less spotted with brown. Joint 1 of antennæ three-tenths longer than pronotum, 2 two and a half times longer than 1, 3 five-eighths the length of 2, one-third longer than 4. Beak reaching sixth ventral. Length, 4.6—5 mm.

Staten Island, N. Y., July 24 (*Davis*). Recorded from Connecticut and District of Columbia. Placed by Reuter as a variety of *puella* but apparently distinct.

730 (—). PHYTOCORIS LUTEOLUS Knight, 1923, 649.

Elongate, subparallel. Head yellow with orange to bright red markings on tylus, cheeks and loræ; pronotum, scutellum and elytra with color as in key and clothed with pale yellowish pubescence; calli and propleura whitish; basal third of corium and embolium and outer half of clavus with orange-red spots; apex of clavus and inner margins of cuneus with bright red spots; membrane pale fuscous, apical half with fuscous spots, veins yellowish; front and middle femora yellowish, paler at base, hind ones with apical half or more dark reddish flecked with yellowish spots; tibiæ pale, reddish near base. Antennæ yellowish, joint

1 one-fourth longer than width of head across eyes, 2 two and one-fourth times longer than 1, 3 nearly three-fifths the length of 2, about one-third longer than 4. Beak reaching fifth ventral. Length, 5—5.2 mm.

Described from Connecticut. Known also from Alabama.

731 (—). *PHYTOCORIS ANGUSTIFRONS* Knight Ms.

Elongate, subparallel. Pale dull yellow; elytra thickly marked with minute whitish tufts of short hairs; vertex, collar and calli whitish-yellow; basal half and sides of pronotum often with a brownish tinge; embolium, tip and inner margin of cuneus with small fuscous dots or spots; membrane pale hyaline, larger cell and two vague spots behind it fuscous, veins whitish; legs pale straw-yellow, apical half of femora pale fuscous, enclosing scattered white dots, hind femora with preapical pale ring; under surface dull yellow, a fuscous stripe along sides of ventrals. Joint 1 of antennæ pale yellow, flecked with brown, one-fifth longer than width of head across eyes; 2 dull yellow, three times as long as 1; 3 fuscous, narrowly paler at base, two-fifths the length of 2; 4 fuscous, as long as 3. Length, 4.5—5.2 mm.

Dunedin and Istokpoga, Fla., Feb. 22—April 20. Beaten in some numbers from bunches of Spanish moss where it was hibernating. Taken by Van Duzee, May 1, at Sevenoaks, Fla. Known only from that State.

732 (949). *PHYTOCORIS INFUSCATUS* Reuter, 1909, 20.

Elongate, subparallel. Head brownish-yellow flecked with red; pronotum with collar and middle of disk dull yellow tinged with reddish, sides and basal third fusco-reddish; elytra with clavus and inner half of corium dark reddish sparsely and vaguely mottled with small yellow spots; embolium and cuneus more distinctly reddish, the latter with base darker; corium with a paler spot on apex; membrane dusky, faintly marbled with pale blotches; antennæ yellowish, the outer joints with a dusky tinge; front and middle legs pale yellow, their femora tinged with reddish; hind femora except basal third, dark fusco-reddish, flecked with small yellow spots; tarsi fuscous. Joint 1 of antennæ one-fifth longer than pronotum, 2 two and three-fourth times longer than 1, 3 about one-half the length of 2, one-third longer than 4. Beak almost reaching base of genital. Length, 5.3—5.7 mm.

Marion Co., Ind., Sept. 25 (*W. S. B.*); one beaten from willow. Aqueduct, N. Y., July 27 (*Davis*). Ranges from Ontario and Massachusetts west to Michigan and southwest to North Carolina. Breeds on hickory and walnut.

733 (—). *PHYTOCORIS OLSENI* Knight, 1923, 647.

Elongate, subparallel. Head pale yellow; loræ, cheeks, middle of tylus median line and sides of base of vertex and oblique lines each side of front, orange-red; pronotum pale brownish-yellow, sides tinged with brownish, calli with a mark in front and a spot behind inner half of

each, orange; scutellum as in key; elytra pale brownish-yellow, middle of inner half of corium and outer half of clavus, dark brown; embolium pale flecked with reddish-orange, cuneus yellowish with vague reddish dots; membrane pale brown, veins darker; legs straw-yellow, hind femora dark brown, apical half reddish with pale spots; front and middle tibiæ each with two reddish-brown rings, those on middle pair often vague, hind tibiæ reddish near base; tarsi yellowish, dusky at tip; ventrals straw-yellow, orange-red on sides. Joint 1 of antennæ pale yellowish, tip and two spots on front face brown, one-sixth longer than width of head across eyes; 2 and 3 yellowish brown, 2 twice as long as 1. Beak reaching seventh ventral. Upper surface clothed with suberect dusky hairs intermixed with silky yellow pubescence. Length, 5.8—6.2 mm.

Known only from New York and New Jersey.

734 (952). *PHYTOCORIS TIBIALIS* Reuter, 1876, 68.

Elongate, subparallel. Pale straw-yellow, sparsely and finely pubescent; some irregular markings on face and a transverse line across vertex between base of eyes, orange-red; disk of pronotum with four short broad orange-red stripes, these not reaching base and in front interrupted by the calli but present, though narrower, on collar; clavus fuscous-brown, its base, a spot near middle and the inner half of corium paler and flecked with reddish; cuneus and membrane pale translucent yellow, their veins reddish; apical halves of front and middle femora and first joint of antennæ annulate with red and yellow; front and middle tibiæ also annulate and with a reddish-fuscous line along their upper surface; ventrals a uniform pale yellow. Joint 1 of antennæ as long as pronotum, 2 more than twice as long as 1, 3 one-third the length of 2, slightly longer than 4. Length, 5—5.3 mm.

Knox Co., Ind., Sept. 23; swept from herbage along the margins of the Wabash River. Ranges from Ontario and New England west to Wisconsin and Iowa and southwest to Texas and Nicaragua. Readily known by the pale color, red markings and dark lines on second antennal and front and middle tibiæ.

735 (—). *PHYTOCORIS VENUSTUS* Knight, 1923, 651.

Elongate-oval. Head orange-red; spot each side of vertex and one on base, two spots on median line of front and one on base of tylus, pale yellow, middle of tylus red; pronotum pale with stripes as in *aa* of key, collar and small spot before each callus orange-red; scutellum red, basal angles and median line paler; elytra as in *i* of key; membrane pale fuscous, veins brown; legs straw-yellow, femora flecked apically with red; hind tibiæ with reddish spots near base; ventrals yellowish, vaguely spotted with red. Antennæ yellowish, joint 1 darker at apex, one-sixth longer than width of head across eyes, 2 nearly twice as long as 1, 3 one and two-third times as long as 2, 4 one-sixth shorter than 3. Beak reaching sixth ventral. Pronotum, scutellum and clavus clothed with rather prominent inclined yellowish hairs. Length, 4.5—4.9 mm.

East River, Conn., July—August (*Walden*). Recorded only from that State, New York and District of Columbia.

736 (—). *PHYTOCORIS DEPICTUS* Knight, 1923, 654.

Elongate, subparallel. Head yellow marked with orange-red; pronotum pale brownish-yellow tinged with dusky, calli pale, disk behind them with four orange stripes; scutellum yellowish with an oblique orange stripe each side; elytra as in key; extreme tip of clavus and a small spot near inner basal angle of cuneus, black, beset with prominent black hairs; membrane pale fuscous, cells and central area with hyaline spots, veins pale fuscous; hind femora as in key; spines on hind tibiæ pale with reddish spots at base; ventrals pale yellow, sides dotted with red. Antennæ yellowish, joint 1 with a few reddish dots, tapering from base to near apex, slightly longer than width of head across eyes; 2 two and two-fifth times longer than 1, 3 and 4 subequal, united almost twice as long as 2. Beak reaching fifth ventral. Upper surface rather thickly clothed with prostrate yellow pubescence. Length, 4.1—5.3 mm.

St. Anthony Park, Minn., Aug. 11 (*Minn. Univ. Coll.*). Known only from Batavia, N. Y., and Minnesota. Occurs on ash and bur oak.

737 (951). *PHYTOCORIS PUELLA* Reuter, 1876, 69.

Male—Elongate, slender, subparallel. General color above dark red with yellow markings; vertex reddish-yellow, front dark orange-red; pronotum with collar and four narrow entire stripes behind calli orange-red, calli and basal angles yellow; scutellum yellow with an oblique reddish spot each side of middle; clavus, except base, and inner half of corium, fuscous-red, corium elsewhere paler; cuneus dark red flecked with yellow; membrane fuscous, the veins red; legs pale yellow, apical half of femora and base of tibiæ with orange-red markings; under surface in great part pale, the sixth ventral and genital fuscous. Joint 1 of antennæ pale yellow with reddish markings, one and two-third times the length of pronotum; 2—4 pale yellow, 2 two and one-fifth times longer than 1, 3 one-fifth longer than 4, the latter subequal in length to 1. Eyes very large, their diameter greater than interocular width. *Female*—Usually pale greenish-yellow; orange stripes on pronotum often interrupted; scutellum pale yellow; elytra everywhere reticulate with orange-red; ventrals, tarsi and apical halves of tibiæ often in great part fuscous. Length, 4.5—5.2 mm.

Lake, Knox and Posey counties, Ind., Aug. 14—Sept. 22. Beverly Hills, Ill., Aug. 31, at light (*Gerhard*). Yaphank, Long Island, N. Y. (*Davis*). Swannanoa, N. Car., July (*Brimley*). My Indiana specimens were swept from weeds along the margins of orchards and roadsides. Its known range extends from Quebec and New England west to Illinois and Kansas and southwest to North Carolina. Van Duzee (1917, 318) includes Florida but there is no definite station record from that State.

738 (—). PHYTOCORIS RUBELLUS Knight Ms.

Close to *puella*. Head and pronotum pale yellow, the former with vague reddish markings, the latter with four rather broad percurrent red stripes; scutellum red with basal angles and tip yellow; elytra dull red, thickly clothed with prostrate whitish hairs, embolium with small yellow spots; cuneus red, inner basal angle darker; membrane dusky hyaline, veins red; femora dull red, paler at base, hind ones with fuscous bars enclosing yellow dots; tibiæ reddish-yellow, tarsi darker. Joint 1 of antennæ shorter and stouter than in *puella*, dark red with yellow spots; 2 reddish-yellow, two and one-half times as long as 1; 3 and 4 fuscous, united equal to 2. Length, 4.8—5.2 mm.

Laporte Co., Ind., Aug. 26. Ranges from Indiana west to Iowa and Kansas.

739 (—). PHYTOCORIS CARYÆ Knight, 1923, 652.

Elongate, sides subparallel. Head yellow with prominent pale hairs and with orange spots on sides of front, behind eyes and on loræ; pronotum greenish-yellow, the four orange stripes often confluent behind, calli pale, collar with orange spot each side of middle; scutellum greenish-yellow; an oblique orange spot each side of middle; elytra as in key; legs yellowish, apical halves of femora flecked with brown or red spots; ventrals pale greenish-yellow. Antennæ yellow, joint 1 with small orange spots, one-fourth longer than width of head across eyes; 2 slightly more than twice as long as 1; 3 three-fifths the length of 2, one-third longer than 4. Beak reaching upon fifth ventral. Length, 5.3 mm.

Batavia, N. Y., July 29 (*Walden*). Recorded only from there; occurs on hickory.

V. STENOTUS Jakovlef, 1877, 288.

Elongate, suboval, almost glabrous shining species of medium size having the head porrect, not exserted, its front subvertical, vertex without an impressed line; eyes large, oval, their long diameter slightly greater than width of vertex; beak reaching third ventral; pronotum subtrapezoidal, its side margins rounded, hind portion convex, finely rugose; scutellum largely exposed, slightly convex; elytra entire, surpassing the abdomen; hind femora reaching genital plate; joint 1 of hind tarsi twice as long as 2. One species is known.

740 (969). STENOTUS BINOTATUS (Fabricius), 1794, 172.

Greenish-yellow. Male with tylus and two broad divergent stripes on pronotum black, the stripes extending from calli back to cover basal two-thirds of clavus and inner portion of apical half or more of corium; scutellum yellow the side margins of base black; cuneus yellow; membrane fuscous with paler veins; genital segment and a row of spots along outer margins of ventrals blackish; tarsi fuscous. Pronotum of

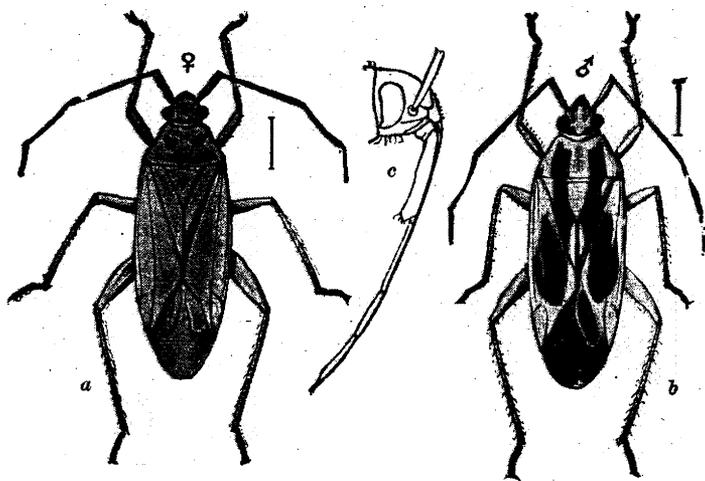


Fig. 169. a, female; b, male, X 6; c, head from side. (After Howard, Insect Life).

female with two ill-defined rounded dark spots behind the calli, the stripes on elytra narrow, interrupted, limited to the claval suture and inner apical fourth of corium; membrane and under surface wholly greenish-yellow. Antennæ about as long as body, joint 1 as long as head, 2 two and a half times longer than 1, 3 one-half the length of 2, nearly twice as long as 4. Length, 6.2—7 mm. (Fig. 169).

Marion and Putnam counties, Ind., June 1—July 4; common along the borders of wet meadows and fields of oats and wheat. Delaware Co., Pa., June (*Gerhard*). Swannanoa, N. Car., (*Brimley*). A palæarctic European species, known as the "timothy-grass bug," and ranging in this country from Quebec and New England west to Minnesota and the Pacific. Not before recorded south of Maryland. From the records it seems to reach maturity about May 15 and almost wholly disappears by the middle of July. Howard (1892, 90) mentions it as injurious to timothy in Green Co., N. Y., the insect in all stages being found in numbers upon the heads in early July. Knight states that it "breeds on orchard grass, *Dactylus glomerata* L., and probably to some extent on other grasses."

VI. CREONTIADES Distant, 1883, 237.

Elongate, finely pubescent, shining species having the head porrect, its front declivent, vertex with a median impressed line; eyes large, oval, coarsely granulated; beak reaching or

surpassing hind coxæ; pronotum trapezoidal, its width at base about twice that of apex, sides rounded, basal portion convex, finely rugose; scutellum subtectiform, minutely transversely rugose; elytra entire, surpassing abdomen; hind femora reaching tip of abdomen; tibiæ with long and prominent setæ. Five species are recorded by Van Duzee (1917) from North America, three from our territory.

KEY TO EASTERN SPECIES OF CREONTIADES.

- a. Color greenish- or straw-yellow, more or less tinged with reddish; apex of corium without brown dots.
- b. Front of vertex subdepressed; calli scarcely evident; upper surface and legs more or less tinged with reddish.

741. RUBRINERVIS.

- bb. Front of vertex rather strongly convex; calli distant, rather prominent; upper surface and legs not tinged with reddish.

742. DEBILIS.

- aa. Color in great part piceous; apex of corium with three brown dots.

743. FILICORNIS.

741 (960). CREONTIADES RUBRINERVIS (Stal), 1862, 321.

Elongate, slender, subparallel. Greenish-yellow fading to straw-yellow, usually more or less tinged with rosaceous; pronotum with sub-basal margin blackish, the edge behind it whitish; scutellum of female often in great part fuscous; elytra with the inner marginal veins of clavus and commissure and the veins of membrane rosaceous; sometimes the entire elytra, including cuneus, strongly tinged with the same hue; membrane pale fuscous-hyaline, veins reddish; antennæ greenish-yellow, joints 1 and 2 often reddish, the apical third of joints 2 and 3 darker; legs straw-yellow tinged with reddish, the tibiæ of males and sometimes of females in great part green; tarsi in part and tarsal claws fuscous. Joint 1 of antennæ stout, cylindrical, finely and sparsely setose, as long as pronotum, 2 about twice the length of 1, 3 one-fifth shorter than 2, more than twice the length of 4. Width of apex of pronotum about two-thirds the median length of disk. Length, 6.5—8 mm.

Sanford, Sarasota and Dunedin, Fla., Nov. 17—April 4. Occurs throughout the greater part of that State but not taken by me or recorded from the extreme southern portion. About Dunedin it is common in late autumn and spring, both on Hog Island and the mainland, on low huckleberry and other shrubs and grasses in the open pine woods and along the margins and pathways of hammocks. Described from Mexico and recorded in this country only from Florida and California.

742 (964). CREONTIADES DEBILIS Van Duzee, 1915, 111.

Smaller and more slender than *rubrinervis*. Color a nearly uniform pale straw-yellow; tibiæ translucent green; extreme tips of scutellum

and beak and tarsal claws fuscous. Pronotum shorter, broader, much less narrowed in front than in *rubrinervis*, its apex subequal in width to median length; calli distinct, their front halves connected. Beak reaching onto first ventral. Length, 6 mm.

Tybee Island, Ga., July 26 (*Van D.*). This is the type locality and it is recorded only from there and Estero, Fla.

743 (1961). *CREONTIADES FILICORNIS* (Walker), 1873, 96.

"*Female*—Piceous, fusiform, finely punctured, tawny beneath. Head triangular. Eyes slightly prominent. Rostrum tawny, extending a little beyond hind coxæ. Antennæ tawny, filiform, as long as body; first joint much longer than head; second more than twice the length of first; third a little longer than first, fourth much shorter than third. Prothorax with a strongly marked transverse furrow. Legs tawny, slender. Corium tawny; tip with a red spot and with three brown dots. Membrane brownish. Length of body 4 lines. St. John's Bluff, East Florida. Presented by E. Doubleday, Esq."

The above is the original description of the *Capsus flicornis* of Walker. Distant (1904, 106) placed it in the genus *Creontiades*, though in color it is apparently widely different from our other species.

VII. POLYMERUS Hahn I, 1831, 27 (*Pæciloscytus* Fieb.).

Oblong or elongate-oval pubescent species having the head short, distinctly wider across the eyes than long, the front subvertical; base of tylus viewed from above, distinctly below (in front of) the insertion of antennæ; beak usually reaching to or beyond middle coxæ; antennæ shorter than body, variable as to species, the last two joints much more slender than the others; pronotum trapezoidal, about twice as wide at base as long, without median constriction, calli evident but feeble, hind portion convex, declivent forward, more or less rugose; scutellum triangular, equilateral, convex; elytra entire, surpassing abdomen, male, or reaching only its tip, female, cuneus and membrane strongly deflected. About 30 species are known from the United States, 15 of which occur in our territory. They were formerly classed under the generic name *Pæciloscytus* Fieber.

KEY TO EASTERN SPECIES OF POLYMERUS.

- a. Beak reaching upon or surpassing hind coxæ.
- b. Larger, length usually 4.3 or more mm.
- c. Cuneus wholly or in great part red, rarely paler; beak reaching onto first ventral; general color greenish-yellow varied with blackish; apical half of femora annulate with brown.

744. BASALIS.

- cc. Cuneus not red; beak not passing hind coxæ.
- d. Upper surface black and pale; apical half of femora reddish-yellow; cuneus and scutellum, except basal angles, pale; tibiæ pale. 745. NIGROPALLIDUS.
- dd. Upper surface uniformly black, the tips of embolium and cuneus alone pale; apical half of femora reddish-brown with a pale subapical ring; tibiæ yellowish stained with reddish. 746. TINCTIPES.
- bb. Smaller. Length, less than 4 mm.
- e. Pronotum fuscous-black, the collar, edges of side margins, area in front of and each side of calli, and a backward projecting ray between them dull yellow; hind femora with brown spots; length 3.5—3.8 mm. 747. CUNEATUS.
- ee. Color of pronotum not as above; beak reaching sixth ventral; femora without spots or rings; length, 3.2 mm. 748. DELONGI.
- aa. Beak not reaching upon hind coxæ.
- f. Beak reaching upon middle coxæ.
- g. Upper surface black, the narrow apex of cuneus and a line each side of fracture, paler; tibiæ uniformly black. 749. PROXIMUS.
- gg. Upper surface black and pale; cuneus with at least the inner half red, tip of scutellum and basal third of corium pale; tibiæ pale. 750. UNIFASCIATUS.
- ff. Beak not reaching middle coxæ.
- h. Tibiæ in part or wholly pale; upper surface in great part black.
- i. Elytra wholly black clothed with silvery silken pubescence; legs tinged with fuscous. 751. NUBILIPES.
- ii. Elytra in part pale.
- j. Legs almost wholly pale.
- k. Cuneus black, its narrow carinate edge and that of embolium wholly pale; apical half of hind femora with several fuscous dots near middle of outer face. 752. PUNCTIPES.
- kk. Cuneus and embolium pale or reddish-yellow; legs wholly reddish-yellow, the apical half of hind femora with not more than one fuscous dot. 753. FULVIPES.
- jj. Legs in part black; femora red, the apical third black; tibiæ orange-red at middle, the base and tip black. 754. VENUSTUS.
- hh. Tibiæ wholly black.
- l. Femora red with only the tips black; beak reaching onto front coxæ.
- m. Larger, length 6.4 mm.; embolium and cuneus wholly black. 755. GERHARDI.
- mm. Smaller, length 4.5—5 mm.; embolium and outer edge of cuneus yellowish. 756. BREVIROSTRIS.
- ll. Femora not red; beak reaching behind front coxæ; length, not more than 6 mm.

- n.* Cuneus red; second antennal distinctly more slender than basal one; upper surface black, somewhat shining, clothed with silvery silken pubescence. 757. VENATICUS.
- m.* Cuneus black; second antennal equal to first in thickness; upper surface deep black, opaque, scutellum and elytra clothed chiefly with black pubescence. 758. OPACUS.

744 (991). POLYMERUS BASALIS (Reuter), 1876, 73.

Elongate-oval, sparsely clothed with yellow or silvery appressed pubescence. General color dull greenish-yellow with variable fuscous or black markings; vertex transversely striate with oblique parallel black lines each side of middle, tylus black, shining; disk of pronotum with a line across the subapical constriction, a small round spot on each callus and two spots, varying much in shape and size, just behind the calli, blackish, these sometimes merging so that the disk is in great part blackish; scutellum pale greenish-yellow, its base and side margins from base to middle usually blackish; elytra with clavus and inner apical half of corium fuscous-black, cuneus in part or wholly reddish; membrane translucent fuscous or dusky, its veins paler; first antennal shining black with both extreme base and apex whitish; second reddish-brown with a black ring at base, its apical fourth and third and fourth antennals fuscous; under surface and legs greenish-yellow, the apical third of femora annulate with reddish-brown, tibial spines black; middle of ventrals 1—3 usually blackish in female. Length, 4.5—5.5 mm.

Frequent throughout Indiana, June 5—Oct. 6. Dunedin, Moore Haven and Canal Point, Fla., Nov. 16—April 10 (*W. S. B.*). Agricultural College, Miss. (*Weed*). Occurs in Indiana on foliage and flowers along roadsides and on weeds, especially ragweed and dog-fennel, in meadows. Found throughout Florida, where it is frequent in spring on tall grasses along margins of ponds. It is our most common and most widely distributed species of the genus, ranging from Quebec and New England west to South Dakota and Colorado, and southwest to Florida, Texas and New Mexico. Varies exceedingly in color and also in the amount of pubescence, the majority of cabinet specimens being almost glabrous. Those taken in autumn are usually darker than the ones of early summer, some having the entire upper surface, except cuneus, base of corium and tip of scutellum, fuscous-black. On these Knight has based his var. *fuscatus*^{80a}. For a pale form found in the southern states, in which the beak is generally shorter and the eyes of male somewhat larger than those of the north, Knight^{80a} has restored the name *sericeus* Uhler (1877, 422), usually regarded as a synonym of *basalis*. Of this Uhler wrote: "In Maryland it may be met with from the first of June to the end

^{80a} There has appeared since these pages were in type a paper by Knight (*Can. Ent. July, 1926*) in which these names were used. In it he also records *P. flavo-ovineatus* Reut. (1907b, 3), a Jamaican species, from Sanford and Biscayne Bay, Fla.

of October, and it lives upon violets, weeds and herbs in low grounds."

745 (—). *POLYMERUS NIGROPALLIDUS* Knight, 1923, 599.

Head black, with median line, loræ and spot next to eye on vertex, dull yellow; pronotum black, the collar, front margins of calli, line between them, dot on disk and basal margin, yellowish; scutellum dull yellow, the basal angles and mesoscutum blackish; elytra dull yellow, clavus with inner half and corium with outer margin and stripe on outer portion of apical half blackish; membrane dark fuscous, veins paler; legs tawny-yellow, spines of tibiæ and last tarsal segment blackish; ventrals yellow with paler pubescence. Antennæ black, joint 1 two-fifths as long as width of head across eyes; 2 four times the length of 1, two and one-fifth times as long as 3. Length, 4.3—4.5 mm.

Described from Brown's Mills Junction, N. J., and known only from there.

746 (—). *POLYMERUS TINCTIPES* Knight, 1923, 600.

Color as in key, clothed above with silken white pubescence; membrane fuscous-brown; narrow apex of cuneus and embolium pale; femora with basal halves yellowish, their lower face with numerous erect hairs, each hair with a fuscous dot at base; ventrals black with paler pubescence. Antennæ black, brownish apically, joint 1 three-fourths as long as width of vertex, 2 as long as width of pronotum at base; 3 one-half the length of 2, one-third longer than 4. Beak reaching hind margins of hind coxæ. Length, 3.7—4.2 mm.

Recorded only from Great Falls, Md., where it was collected on a lichen covered rock.

747 (—). *POLYMERUS CUNEATUS* (Distant), 1893, 435.

General color above fuscous-black, head with tylus shining black, cheeks, loræ, a spot on middle of vertex and another near each eye, dull yellow; color of pronotum as in key; tip of scutellum yellowish; outer half of clavus and basal fourth of corium usually more or less dull yellow; embolium, anal ridge, outer apical angle of corium and tip of cuneus also yellowish; membrane a uniform translucent fuscous, feebly iridescent, veins yellow; legs dull greenish-yellow, hind femora with two rows of small vague brownish dots on outer face and usually a brownish ring near apex, sometimes in great part fuscous-brown, tips of tarsi and beak fuscous; under surface dull yellow, the pleura and side margins of ventrals more or less fuscous. Joint 1 of antennæ yellow, fuscous near base and apex, three-fourths as long as basal width of vertex; 2 yellow, the apical fourth black, three and a half times longer than 1; 3 fuscous, yellow at base, one-third longer than 4, the two united two-thirds the length of 2. Disk of pronotum very finely rugose, with minute punctures between the rugæ. Scutellum finely transversely rugose. Clavus and corium very finely punctate. Beak reaching hind coxæ. Length, 3.5—3.8 mm.

R. P. Park, Canal Point and Ft. Myers, Fla., March 4—April 8; swept in some numbers from low herbage growing in moist mucky places. Recorded also from Biscayne Bay, Fla., and Texas. Described from Mexico and Central America. Uhler (1894a, 193) says of it in Grenada: "It is a common species in the Antilles and on the borders of the adjoining continent. Many specimens were collected at light and others swept from herbage in August." The *P. clandestinus* Blatch. (1926, 164) is a synonym.

748 (—). *POLYMERUS DELONGI* Knight, 1925, 252.

Pale reddish-brown clothed with fine yellow appressed hairs intermixed with paler suberect ones; vertex yellowish, tylus fuscous; pronotum tinged with reddish, front angles each with a round blackish spot; lower margins of propleura pale; mesoscutum fuscous, narrowly exposed; apex of scutellum pale; elytra yellowish tinged with reddish, inner half of clavus pale fuscous, cuneus yellow, the inner half reddish; membrane fuscous, the veins and margins near apex of cuneus pale; coxæ and front and middle femora yellowish tinged with reddish; hind femora dark red, paler at base and apex; tibiæ and tarsi yellowish; ventrals reddish-yellow, genital region darker. Joint 1 of antennæ yellowish, as long as width of vertex; 2 yellow at base, fuscous toward apex, four times as long as 1; 3 dusky yellow, two-thirds the length of 2. Length, 3.2 mm.

Known only from Paradise Key, R. P. Park, Fla.

749 (—). *POLYMERUS PROXIMUS* Knight, 1923, 601.

Color a nearly uniform black, clothed above with yellowish and black pubescence intermixed; scutellum narrowly pale each side of apex; membrane and veins dark fuscous; legs and ventrals wholly black, the latter with pale pubescence. Antennæ black, brownish apically, joint 1 as long as or slightly longer than width of vertex, 2 as long as width of pronotum at base, 3 two-fifths as long as 2. Beak barely reaching hind margins of middle coxæ. Length, 5.3 mm.

Recorded from Pennsylvania, Minnesota and Missouri.

750 (988). *POLYMERUS UNIFASCIATUS* (Fabricius), 1794, 178.

Male—Elongate, subparallel. Black with yellow markings, clothed with fine depressed, golden yellow hairs and a few blackish suberect ones; head yellow, vertex and tip of tylus shining brown; pronotum black, its collar, narrow side margins, median dash and edge of hind margin, yellow; apex of scutellum, basal third and apex of corium, apical half or more of embolium, anal ridge, apical third or more of front and middle femora and all the tibiæ, yellowish; hind femora either fuscous-black with basal half and two subapical bands dull yellow or wholly pale yellow; membrane fuscous, the veins and central area paler. Antennæ with joint 1 and basal third of 2 yellowish, remainder brown to blackish; 1 as long as width of vertex, 2 two and a half times as long as 1. Prono-

tum coarsely transversely wrinkled, scutellum more finely so; calli smooth, united at middle, each with a distinct concavity. Elytra surpassing abdomen by more than half the length of membrane. *Female*—More robust, suboval, widest across base of cuneus. Dull brownish-yellow with dark markings vague, sometimes only the clavus and apical half of corium tinged with brownish. Joint 2 of antennæ more slender and one-third longer than in male. Beak reaching behind middle coxæ. Elytra sometimes abbreviated and reaching only tip of abdomen. Length, 5.4—6.2 mm.

Champaign, Ill., June 14, at light; New Mexico (*Ill. Nat. Hist. Surv. Coll.*). A palæarctic European species ranging in this country from Quebec and New England west to Colorado, North Dakota and British Columbia, and in the southwest known from Utah and New Mexico. Breeds on the bedstraw, *Galium boreali* L.

751 (—). POLYMERUS NUBILIPES Knight, 1925, 248.

Black, feebly shining; above clothed with silvery-gray to yellowish-brown pubescence, intermixed with scattered suberect fuscous hairs; legs orange-yellow, apical half of femora and basal half of tibiæ heavily tinged with fuscous, the former with an incomplete subapical pale ring; tips of tibiæ and last tarsal joint, blackish. Antennæ black, brownish apically, joint 1 as long as width of vertex, 2 equal in length to width of base of pronotum, two and one-fourth times longer than 3; 4 one-eighth longer than 3. Beak reaching middle of sternum. Length, 4.7 mm.

Recorded only from Greenwood, Wis., and Minnesota.

752 (—). POLYMERUS PUNCTIPES Knight, 1923, 602.

Oblong-oval. Black, scabrous, subopaque, sparsely clothed with fine silky prostrate silvery gray pubescence; head with a small round yellow spot each side of vertex; narrow outer edge of embolium and cuneus pale yellow; membrane fuscous, its veins pale. Joint 1 of antennæ half the length of pronotum, black with base yellow; 2 fuscous, nearly as thick as and three and three-fifth times the length of 1; 3 yellowish tinged with dusky, one-third the length of 2; 4 fuscous, one-fifth longer than 3. Length, 4.6—5.4 mm.

Starke and Marshall counties, Ind., June 11—18. Swept in some numbers from herbage along the borders of lakes. Swannanoa, N. Car., June 23 (*Brimley*). Ranges from Quebec and New England west to Minnesota and south to Jacksonville, Fla. Knight swept it "from scattering plants of whorled loosestrife, *Lysimachia quadrifolia* L., which were growing along an old clay roadway."

753 (—). POLYMERUS FULVIPES Knight, 1923, 603.

Elongate, suboval. Black, feebly shining, clothed with silken yellow pubescence; embolium, cuneus and legs as in key; membrane dark fus-

cous, a narrow pale spot bordering tip of cuneus, veins yellowish; tarsi and tips of tibiæ fuscous; ventrals black. Joint 1 of antennæ yellowish, with apex and pubescence black, slightly longer than width of vertex; 2 black, cylindrical, slightly narrowed at base, as thick as and three and one-half times longer than 1; 3 fuscous, nearly one-third the length of 2; 4 blackish, one-fourth longer than 3. Beak reaching middle of sternum. Pronotum and scutellum minutely transversely rugose. Elytra finely scabrous. Length, 4.5—5.1 mm.

Ashland, Mass., June 27 (*Frost*). Danielson and New Haven, Conn., June 14—21 (*Walden*). The recorded range extends from New England west to South Dakota and south to North Carolina.

754 (—). *POLYMERUS VENUSTUS* Knight, 1923, 605.

Black, opaque, minutely and sparsely pubescent, lower margin of cheeks and basal joints of beak, red; membrane dark fuscous, its veins paler; coxæ, basal two-thirds of femora and middle of tibiæ orange-red; tarsi yellow, their tips and claws fuscous. Antennæ with joint 1 stout, black, four-fifths as long as greatest width of head; 2 reddish-fuscous, more slender, two and a half times the length of 1; 3 dull yellow, one-half the length of 2; 4 fuscous, subequal in length to 3. Pronotum minutely granulate, transversely finely strigose. Scutellum and elytra scabrous. Length, 5.2—5.8 mm.

Dunedin, Fla., March 14—29; swept in some numbers from the flowers of American germander, *Teucrium canadensis* L., and lizard's tail, *Saururus cernuus* L., growing in low moist ground. Wenona, N. Car., May 25 (*Brimley*). Recorded by Knight from Michigan, Virginia and North Carolina. Hussey reports it as: "Abundant, in Berrien Co., Mich., June to September, in beds of *Saururus cernuus* growing in shady glens and marshes."

755 (—). *POLYMERUS GERHARDI* Knight, 1923, 606.

Black, opaque, thickly clothed with prostrate silky white pubescence; vertex with a yellowish spot each side; membrane and veins a uniform dark brownish-black; antennæ black, the apical joints reddish to fuscous; coxæ and femora deep orange-red; tibiæ, tarsi and tips of femora black. Joint 1 of antennæ half the length of pronotum, 2 three and one-fifth times the length of 1, 3 slightly less than half the length of 2, a little longer than 4. Pronotum and elytra finely, irregularly rugulose, the latter with suberect simple black hairs intermixed with the pubescence. Length, 6.4 mm.

Hessville, Lake Co., Ind., July 1, type locality (*Gerhard*); collected at light. Recorded only from there and Cotulla, Tex.

756 (—). *POLYMERUS BREVIROSTRIS* Knight, 1925, 246.

Black, clothed with yellow silky pubescence intermixed with pale and fuscous suberect hairs; narrow basal margin of pronotum, embolium and

usually the narrow outer edge of cuneus dull yellow; membrane black, veins yellowish; legs orange to red, tibiæ, tarsi and tips of femora black, hind femora with a vague subapical fuscous band. Joints 1 and 2 of antennæ black, 1 as long as width of vertex, female, slightly longer, male; 2, three and four-fifths times the length of 1; 3 orange-yellow, fuscous apically, two-fifths as long as 2; 4 fuscous, paler at base, one-third longer than 3, male, one-eighth longer than 3, female. Beak scarcely reaching hind margins of front coxæ. Length, 4.5—5 mm.

The recorded range extends from Wisconsin and Manitoba west to the Dakotas.

757 (995). *POLYMERUS VENATICUS* (Uhler), 1872a, 471.

Elongate-oblong. Black, finely granulose, rather thickly clothed with very fine prostrate silky silvery-gray pubescence; vertex with a small yellow spot near each eye; cuneus and extreme tip of embolium reddish-yellow; membrane fuscous-brown, its veins yellowish; legs in great part black, in female the coxæ, basal half of hind and middle femora, front femora except the upper face of apical half and joints 1 and 2 of tarsi, yellow; coxæ usually black in male. Antennæ with joints 1 and 2 black, 3 and 4 dull yellow; 1 as long as head, 2 three times as long as 1, 3 and 4 subequal, together two-thirds the length of 2. Length, 5—6 mm.

Starke, Marshall, Marion and Putnam counties, Ind., June 9—18; probably occurs throughout the State; swept from herbage along the margins of marshes and lakes. Swannanoa, N. Car., June 22 (*Brimley*). The coxæ of male are sometimes yellow as in female, not always black as stated by Knight, and in one specimen at hand the narrow edge of embolium is wholly pale as in *punctipes*. The general distribution is northern, extending from Quebec and New England to the Pacific, but it is also recorded by Van Duzee (1909, 178) from Sanford, Fla., under the name *Polymerus americana* Reut., which he regards as a synonym. Under this name it is also recorded from Texas and New Mexico by Uhler (1904, 357), who says: "The range of this species is now seen to be from the uplands of Texas and New Mexico, northwest into British Columbia and from thence eastwardly to the Province of Quebec and Northern Maine." Many of the early records should doubtless be referred to *P. punctipes* Knight.

758 (—). *POLYMERUS OPACUS* Knight, 1923, 604.

Black, opaque, clothed with silvery and blackish silky pubescence; membrane brownish-black, veins yellowish to dusky; legs black, coxæ, basal third of femora and two basal joints of tarsi, yellowish. Joints 1 and 2 of antennæ black, 1 slightly longer than width of vertex; 2 three

and one-half times the length of 1; 3 and 4 dusky yellow, subequal, each nearly two-fifths as long as 2. Beak reaching middle of sternum. Length, 4.3—4.8 mm.

Tompkins Co., N. Y., July 3 (*Walden*). Recorded only from Ontario, New England and New York. Breeds on the flat-topped white aster, *Dællingeria umbellata* (Mill.).

VIII. DICHROOSCYTUS Fieber, 1858, 309.

Oblong or elongate, subparallel species having the head short, twice as broad across the eyes as long, its front declivent, vertex margined at base between the eyes, without median sulcus; antennæ shorter than body, joint 1 stout, cylindrical, not surpassing tip of tylus, 2 more slender, not swollen toward apex, more than three times as long as 1, 3 and 4 still more slender, united distinctly shorter than 2, 4 about three-fourths the length of 3; beak reaching or passing second ventral; pronotum short, trapezoidal, twice as wide at base as long, collar and calli distinct; disk behind the calli convex, finely rugose with minute punctures between the rugæ, its hind margin broadly rounded; scutellum triangular, equilateral, higher than clavus; mesoscutum concealed; elytra entire, longer than abdomen, clavus convex, deflected to corium, cuneus and membrane strongly deflected; tarsi with joints 1 and 2 subequal, 3 almost as long as the others united. Seven species have been described from North America, four from our territory. They occur for the most part on cedar and pine.

KEY TO EASTERN SPECIES OF DICHROOSCYTUS.

- a. Larger, length 4.5 or more mm.; base of scutellum, elytra, except embolium and inner angles of cuneus, usually deep reddish.
 - 759. SUSPECTUS.
- aa. Smaller, not over 3.5 mm.; elytra greenish or greenish-yellow, at the most only tinged with reddish.
 - b. Eyes of moderate size, their long diameter not greater than width of interocular area; elytra without a distinct fuscous cross-bar on apical third of corium.
 - c. Membrane pale green; pubescence of pronotum very fine, scarcely visible; elytra greenish tinged with reddish. 760. ELEGANS.
 - cc. Membrane fuscous; pubescence on pronotum blackish, more conspicuous; elytra bright green or greenish-yellow.
 - 761. VIRIDICANS.
- bb. Eyes very large, their long diameter distinctly greater than width of interocular area; elytra with a distinct fuscous cross-bar on apical third of corium.
 - 762. MACULATUS.

759 (996). *DICHRROSCYTUS SUSPECTUS* Reuter, 1909, 37.

Greenish-yellow; elytra usually heavily tinged with reddish, but often fading to greenish-yellow with a faint roseate tinge; embolium and inner basal angle of cuneus paler, subtranslucent; membrane pale translucent with a faint dusky tinge, veins reddish; upper surface thinly clothed with fine prostrate yellowish hairs. Head scarcely one-fourth narrower than base of pronotum, vertex very wide, with basal carina prominent. Pronotum with calli prominent, rather widely separated. Length, 4.8—5 mm.

Lakehurst, N. J., May 29 (*Davis*). Washington, D. C., June 4 (*Gerhard*). Ranges from New England west to Colorado, not recorded south of District of Columbia. Breeds on pine.

760 (997). *DICHRROSCYTUS ELEGANS* Uhler, 1904, 356.

General color pale green, fading to greenish-yellow; elytra often strongly tinged with reddish; cuneus pale greenish-yellow with reddish markings; membrane pale greenish-translucent with veins of cells reddish; antennæ greenish, becoming dusky toward tip; legs greenish-yellow, the femora with vague reddish dots; beak and tarsal claws fuscous. Length, 2.8—3.2 mm.

Putnam Co., Ind., July 24—Oct. 1; beaten from red cedar, *Juniperus virginiana* L., where it occurred in company with *Parthenicus juniperi* (Heid.). Lakehurst, N. J., May 28, from white cedar (*Davis*). Ranges from Ontario and New England west to the Pacific and southwest to North Carolina and New Mexico, occurring on cedar throughout its range.

761 (—). *DICHRROSCYTUS VIRIDICANS* Knight, 1918b, 114.

Form and size of *elegans*. Differs in color as shown in key; head, coxæ and femora often turning pale to brownish; pronotum and scutellum often more yellowish-green; cuneus green with margins of apical half reddish; veins of membrane reddish or dull yellow; tip of cuneus blackish. Length, 3.2—3.3 mm.

New Ulm, Minn., June 20 (*Minn. Univ. Coll.*). Recorded only from New Hampshire and New York. Originally described as a color variety of *elegans* and that is probably its proper status.

762 (999). *DICHRROSCYTUS MACULATUS* Van Duzee, 1912a, 483.

Pale greenish-yellow, often with a pinkish tinge; pronotum usually immaculate, sometimes with a fuscous blotch on basal half; elytra with an oval spot on inner angle of clavus and a narrow transverse bar across apical third of corium, fuscous, these markings varying in size and intensity; membrane pale translucent with a dusky cloud across the apex and apical half of cells, veins and inner apical margin of cuneus usually reddish; under surface and legs pale greenish-yellow, apical third of hind femora and sides of abdomen sometimes reddish-fuscous. Joints

1 and 2 of antennæ greenish, 3 and 4 fuscous, 2 one-half longer than 3 and 4 united. Length, 3—3.5 mm.

Dunedin, Fla., Feb. 18—April 23; taken in numbers on red cedar, also singly at porch light (*W. S. B.*). Sevenoaks, Fla., May 1 (*Van Duzee*). Described from Sevenoaks and not recorded elsewhere. Easily known from our other species by the very large eyes and the fuscous markings of elytra.

IX. BOLTERIA Uhler, 1887a, 33.

Oblong, depressed species having the head broad, its front short, subvertical, not projected in front of eyes; vertex short, flat, carinate at base; eyes very large, reniform, contiguous with pronotum; tylus flat, cheeks long, convex; beak reaching third ventral, its basal joint broad, compressed; pronotum three-fourths wider at base than long, almost flat, declivent forward, calli small, widely separated; elytra entire, cuneus with a deep notch at base of outer margin. Four species are known, two of them from the southern states. They occur on pine.

KEY TO EASTERN SPECIES OF BOLTERIA.

- a. Joint 1 of antennæ three-fourths as long as width of vertex; pronotum wholly pale brownish-yellow; membrane a uniform fuscous-brown. 763. LUTEIFRONS.
- aa. Joint 1 of antennæ one-eighth longer than width of vertex; basal third of pronotum piceous-brown; membrane pale hyaline, the apical third of cells brown. 764. SEMIPICTA.

763 (—). *BOLTERIA LUTEIFRONS* Knight, 1921a, 73.

Head and pronotum pale yellowish-brown, the tylus, calli and collar somewhat darker; elytra testaceous, shining, subtranslucent; clavus and apical third of corium heavily tinged with fuscous, minutely pale pubescent; cuneus pale yellow, its apical third darker; membrane a uniform fuscous-brown; sterna brownish, shining; ventrals yellowish with paler pubescence. Joints 1—3 of antennæ testaceous, 4 infuscated, 1 as in key, 2 four times longer than 1, 3 two-fifths as long as 2. Structural characters as under generic heading. Length, 4.2 mm.

Known only by the single male type taken from pine by Van Duzee, April 17, near Raleigh, N. Car.

764 (—). *BOLTERIA SEMIPICTA* sp. nov.

Head, collar and calli of pronotum pale reddish-brown; median third and humeral angles of pronotum greenish-yellow; tylus and basal third of pronotum piceous-brown; scutellum piceous-brown, apex and basal angles paler; elytra greenish-yellow, translucent, apical two-thirds of

clavus, apical fourth of corium and a blotch on basal third of latter piceous; cuneus yellowish-hyaline, its extreme tip piceous; membrane as in key; femora pale yellow, apical half of hind pair piceous; tibiæ dull yellow; coxæ and middle of under surface pale yellow, sides with a broad piceous stripe extending from eye to apex of genital. Joints 1—3 of antennæ pale yellow, 1 as in key, 2 three and two-third times as long as 1, 3 one-third the length of 2, 4 fuscous, two-fifths as long as 3. Eyes extremely large, their long diameter more than twice the width of vertex. Pronotum finely transversely rugose. Upper surface thickly but finely pubescent. Length, 4.3 mm.

Dunedin, Fla., April 23; one male taken at electric porch light.

X. ADELPHOCORIS Reuter, 1896, 168.

Elongate, subparallel, pubescent species having the head porrect, wider across the eyes than long, its front subvertical, vertex with a short median impressed line; eyes very large, almost vertical; pronotum trapezoidal, twice as wide at base as long, its sides not carinate, hind portion convex, rugose, calli united at middle; scutellum large, triangular, almost flat, finely rugose; elytra entire, surpassing abdomen, cells of membrane both large, nearly equal in size, their tips angularly rounded. Two of the four North American species are known from our territory, and a third has been taken in Iowa and is therefore included.

KEY TO EASTERN SPECIES OF ADELPHOCORIS.

- a. Beak not surpassing hind coxæ; cuneus in part or wholly red.
- b. Second antennal in part reddish-yellow; elytra pale to dark brown with yellowish costal area; beak reaching onto hind coxæ.
 - 765. RAPIDUS.
- bb. Second antennal black; elytra fuscous-black, the costal area red; beak reaching apex of middle coxæ.
 - 766. SUPERBUS.
- aa. Beak reaching second ventral; cuneus pale greenish-white, its apex often piceous.
 - 767. LINEOLATUS.

765 (966). ADELPHOCORIS RAPIDUS (Say), 1832, 20; I, 339.

Head reddish-brown, tylus darker; pronotum with calli reddish-brown, collar and basal portion of disk dull yellow, the latter with two rather large oval dark spots, these sometimes united to form a dark cross-bar; elytra pale to dark brown, their costal margins pale yellow, cuneus with inner two-thirds brown, tinged with reddish, or sometimes wholly reddish, the outer margin pale; membrane dusky, its veins darker; femora reddish-yellow, tibiæ and tarsi pale yellow, their tips darker. Joint 1 of antennæ blackish, gradually thicker from base toward apex, three-fourths the length of pronotum; 2 two and a half times longer

than 1, its base and apical third blackish, remainder reddish-yellow; 3 and 4 yellowish at base, darker toward tips, united longer than 2, 4 two-fifths the length of 3. Pronotum and elytra rather thickly clothed with prostrate yellow pubescence. Length, 7—8 mm. (Fig. 170).

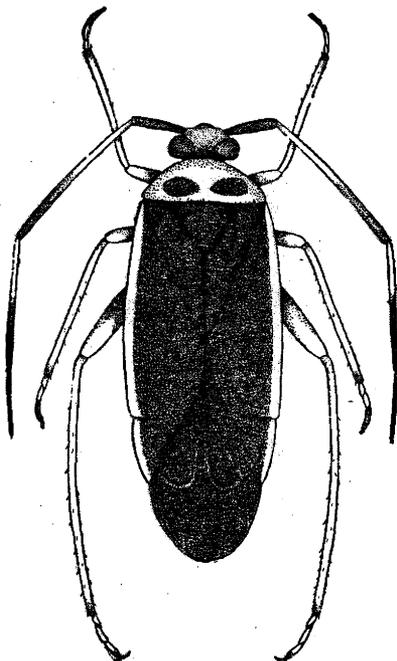


Fig. 170, X 8. (After Forbes).

Common throughout Indiana, June 5—Oct. 16. Occurs in summer on foliage and flowers of various plants, especially those of moist localities; in autumn in numbers on flowers of ironweed, goldenrod and other Compositæ. Breeds on *Rumex crispus* L. and other species of dock. Ranges from Quebec and New England to the Pacific, and southwest to Texas and New Mexico, but in the east not definitely recorded south of New Jersey, though specimens are at hand from Agricultural College, Miss. The older records are mainly under the generic name *Calocoris*. Known economically as the "cotton leaf-bug" and said to do much damage to cotton in Texas.

766 (967). *ADELPHOCORIS SUPERBUS* (Uhler), 1875, 838.

Elongate, subparallel. Upper surface dull red to scarlet, thinly clothed with fine yellowish hairs; clavus, inner apical two-thirds of corium and often the entire scutellum fuscous-black; cuneus usually wholly red. Membrane dark brown, dusky-translucent toward apex; legs dark brown to black, the coxæ and basal halves of hind femora paler; spines and tips of tibiæ fuscous. Joints 1 and 2 of antennæ dark brown to black, 3 and 4 reddish-brown, the base of 3 yellow. Basal two-thirds of pronotum finely but distinctly transversely rugose. Length, 7.5—8 mm.

Golden, Colo., and Ormsby Co., Nev., July (*Gerhard*). Recorded from Iowa and North and South Dakota, and therefore probably occurs in western Wisconsin and Illinois. Its recorded range extends from the Mississippi west to the Pacific. Hussey (1922a, 14) states that in his opinion it will prove to be but a western form of *rapidus*. One of the specimens at hand bears

out this surmise, as it has a brownish cross-bar across the base of scutellum and the middle of second antennal is faintly reddish.

767 (—). *ADELPHOCORIS LINEOLATUS* (Geeze), 1778, 267.

Elongate, subparallel, male, more oval, female. Grayish or greenish-yellow, sparsely clothed with inclined yellow hairs; pronotum often with two blackish spots near basal margin; scutellum with a blackish line each side of middle; apical half or more of inner margin of clavus, outer edge of embolium and a triangular spot on apical third of corium, blackish or piceous; membrane pale hyaline, the outer margin to tip of cuneus, fuscous, veins yellowish; legs pale brownish-yellow, femora flecked with black spots, tibiæ beset with short blackish setæ, tarsi brownish-yellow, claws brown. Joints 1 and 2 of antennæ pale brownish-yellow, 1 thickly clothed with very short inclined black hairs and with a few scattered longer erect ones; 3 and 4 and apex of 2 reddish-brown. Pronotum thickly and finely punctate. Scutellum finely transversely rugose. Length, 7—8 mm.

Chiltern Hills, England, August (*British Mus. Coll.*). A palæartic European species known in this country only from Cape Breton Island, Nova Scotia. Occurs abundantly in Europe on *Chenopodium* and allied wayside weeds.

XI. *CALOCORIS* Fieber, 1858, 305.

Pubescent species of medium size having the head porrect, vertex not margined, front declivent; eyes large, emarginate each side; joint 1 of antennæ with but few minute hairs, cylindrical, slightly passing tip of tylus, not or scarcely longer than head, 2 linear, three times as long as 1, 3 slightly longer than 4; beak reaching second ventral; pronotum trapezoidal, its basal margin broadly rounded; elytra entire, longer than abdomen; hind femora not passing tip of abdomen; first joint of hind tarsi not or but slightly longer than second. One of the three known North American species occurs in the eastern states.

768 (985). *CALOCORIS NORVEGICUS* (Gmelin), 1788, 2176.

Elongate, subparallel, male, suboval, female. Color a uniform dull greenish-yellow, thinly clothed with inclined black and yellow hairs intermixed; pronotum usually with a small dark spot behind each callus; membrane dusky, the veins paler. Male often with a small blackish spot on the apex of corium. Length, 6.5—7 mm.

Staten Island, N. Y., July 17 (*Davis*). A palæartic European species ranging in this country from Quebec and New

England west to British Columbia and southwest to New Jersey. Recorded also, probably in error, from Texas. Occurs on grasses, nettles, etc.

XII. HORCIAS Distant, 1884, 277.

Rather large oblong or oblong-oval glabrous shining species having the head wider across the eyes than long, its front strongly declivent; eyes large, prominent, contiguous to front margin of pronotum; joint 1 of antennæ stout, about as long as head, 2 twice as long as 1, or slightly more, gradually feebly thickened from base to apex, 3 and 4 much more slender, subequal in length; beak reaching or surpassing middle coxæ; pronotum trapezoidal, twice as wide at base as long, collar distinct, calli not prominent, basal portion convex and declivent forward, its surface usually almost smooth or with fine impressed points; scutellum nearly equilateral, slightly convex; elytra entire, cuneus and membrane deflexed; joints 1 and 2 of hind tarsi subequal, 3 slightly shorter than the other two united.

The species of this genus are extremely variable in color, no fewer than 14 color varieties of our common species, *H. dislocatus* Say, having been named. Distant (*loc. cit.*) described 11 new species from Central America, basing them mainly upon color characters alone. Two species are recognized from the eastern states.

KEY TO EASTERN SPECIES OF HORCIAS.⁸¹

a. Form oblong-oval; color extremely variable, but never shining black with scutellum wholly yellow; beak reaching hind coxæ.

769. DISLOCATUS.

aa. Form oblong, subparallel; color shining black, the scutellum usually yellow; beak reaching middle coxæ.

770. FALLAX.

769 (1000). HORCIAS DISLOCATUS (Say), 1832, 21; I, 339.

Oblong-oval. Tylus, upper half of cheeks, base of vertex, two oblong or subquadrate spots on basal half of pronotum, scutellum except a narrow median line, inner half of clavus and an oblique stripe on corium, black; membrane and apex of cuneus piceous; remainder of upper surface reddish or (var. *affinis* Reut.) dull yellow; under surface piceous with a pale line on meso- and metasterna; legs and prosternum yellow,

⁸¹Uhler (1894, 263) described *Pacilocapsus marmoratus* from Lower California and mentioned "fragments of specimens from Texas and Maryland" as being in his collection, "but not in condition for identification." Van Duzee, in his Catalogue, places it under *Horcias* as No. 1003. It is described as being pale yellow irrorated and marbled with brown, with two round brown dots behind calli of pronotum; length 4.3—5 mm. As no eastern record other than that of Uhler can be found, it is not farther considered in this work.

the tarsi in part fuscous; joints 1 and 2 of antennæ shining black, 3 and 4 and extreme base of 2 dull yellow to fuscous. Length, 6—7 mm.

St. Joseph, Marion and Vigo counties, Ind., May 10—June 15; probably found throughout the State. Occurs mainly on mullein, *Verbascum thapsus* L., but often swept from other plants in or along the margins of dense woodland. Ranges from Quebec and New England west to Wisconsin and North Dakota; not recorded south of New Jersey. In some specimens the entire elytra except the costal margin and base of radial vein are black. The form in which the pale color is dull yellow instead of red was described by Reuter (1876, 74) as *Poecilocapsus affinis*. Say, in his original description, gives the color as "pale rufous or somewhat fulvous," thus including both forms. All of the Indiana specimens at hand with two black spots on base of pronotum are of this paler form and according to Knight's key of color varieties cited below, are *Horcias dislocatus affinis* (Reut.). Knight (1923, 608) states that the food plants are "false solomon's seal, *Smilacina racemosa* Desf., wild cranesbill, *Geranium maculatum* L., hare figwort, *Scrophularia leporella* Bick., and occasionally blue cohosh, *Caulophyllum thalictroides* (L.)."

As already noted, the color of this Mirid is exceedingly variable. Knight gives a key to 14 varieties, including the typical form as above described. These color varieties have practically the same distribution and occur on the same plants as the typical form. As five of them are quite common and fairly constant in hue, the following modification of his key is given for their separation.

KEY TO FIVE COLOR VARIETIES OF HORCIAS DISLOCATUS.

- a. Pronotum not wholly black.
 - b. Disk of pronotum red with basal half in part black, but without spots as in typical *dislocatus*. 769a. GONIPHORUS.
 - bb. Pronotum wholly red.
 - c. Elytra red or only slightly infuscated; scutellum wholly black, rarely with a pale median line. 769b. COCCINEUS.
 - cc. Elytra wholly black. 769c. RESIDUUS.
- aa. Pronotum wholly black.
 - d. Elytra with costal margin and often the base of radius pale. 769d. MARGINALIS.
 - dd. Elytra wholly black or with only base of radius pale; femora black, tibiæ chiefly pale. 769e. NIGRITA.

769a (1000b). *HORCIAS DISLOCATUS GONIPHORUS* (Say), 1832, 21; I, 341.
Pronotum red with yellow collar and a single black spot of variable

size on middle of its basal half; scutellum, clavus except base and inner apical half or more of corium black; femora, coxæ and usually the basal half or more of tibiæ, piceous. (Fig. 171).

St. Joseph, Marshall, Marion, Putnam and Vigo counties,

Ind., May 15—June 14. Say considered this a distinct species and mentioned four color varieties. A form in which the red hue is replaced by dull yellow is frequent and was described by Walker (1873, 93) as *Capsus limbatellus*.

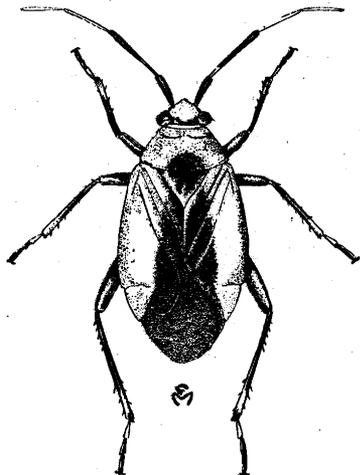


Fig. 171, X 6. (Original).

769b (1000a). *HORCIAS DISLOCATUS COCCINEUS* (Emmons), 1854, pl. 30, fig. 2.

Pronotum except collar, wholly red; scutellum usually wholly black, sometimes with a yellow median stripe; elytra and legs as in the typical form, the former often with only the clavus in part red.

Marion, Putnam, Vigo, Crawford and Perry counties, Ind.,

May 16—June 20. Often occurs in numbers on the foliage of the great ragweed, *Ambrosia trifida* L., growing along margins of streams.

769c (1000g). *HORCIAS DISLOCATUS RESIDUUS* Van Duzee, 1912a, 484; 1916, 39.

Pronotum wholly red; elytra and scutellum uniformly black.

Known from Ohio, Indiana and Minnesota.

769d (1000d). *HORCIAS DISLOCATUS MARGINALIS* (Reuter), 1876, 75.

Wholly piceous-black with only the narrow edge of costal margin and sometimes the basal third of radial vein of elytra pale.

Described from New York, not recorded elsewhere.

769e (1000e). *HORCIAS DISLOCATUS NIGRITA* Reuter, 1909, 41.

Black or piceous-black; face, joints 3 and 4 of antennæ, tibiæ, tarsi and beak wholly or in part paler.

Taken sparingly in Indiana as far south as Owen Co., May 17—July 10. Occurs with the typical form throughout its range, more often in moist places. The variety *pallipes* Van D. (1912, 484) differs only in having the legs pale. Reuter (loc.

cit.) states that *nigrita* and *marginalis* are only dark color varieties of his *affinis*, which, as above stated, is but a pale form of *dislocatus*.

770 (1002). HORCIAS FALLAX Reuter, 1909, 42.

Oblong, subparallel. Black or piceous-black; scutellum usually wholly reddish-yellow or with only its basal angles dark, rarely wholly dark; membrane dusky-translucent; legs and beak pale dull yellow, apical joints of tarsi fuscous; antennæ with joint 1 and basal half of 2 reddish-yellow, remainder fuscous-black. Joint 2 of antennæ two and three-fourth times longer than 1. Length of pronotum, about two-fifths shorter than its basal width; its disk shallowly and sparsely punctate. Length, 5.8—6.2 mm.

Fountain, Marion and Vigo counties, Ind., scarce, June 8—Aug. 8. Occurs on foliage of red-bud, *Cercis canadensis* L. Described from Greensburg, Pa., and heretofore recorded only from there.

XIII. PÆCILOCAPSUS Reuter, 1876, 73.

Elongate, subparallel, shining glabrous species having the head short, nearly twice as wide across eyes as long; front vertical, strongly convex; beak slender, not reaching middle coxæ; pronotum subtrapezoidal, twice as wide at base as long, disk with collar and calli prominent, hind portion convex, somewhat flaring, almost smooth, hind margin broadly rounded; scutellum triangular, equilateral, almost flat; elytra entire, surpassing abdomen, constricted at base of cuneus; hind tarsi with joints 1 and 2 subequal, 3 longer. One species and a variety occur in North America and our territory.

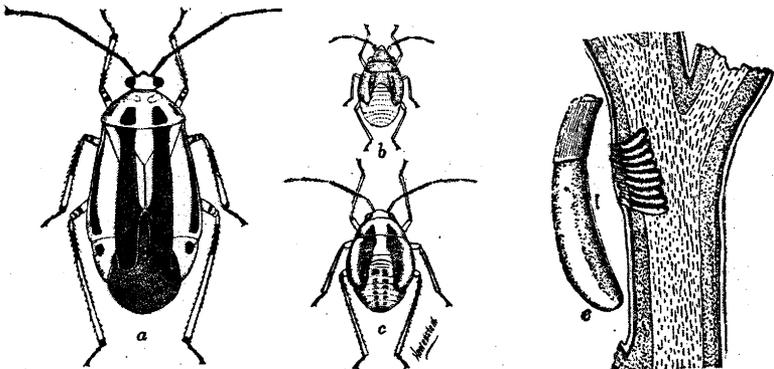


Fig 172. a, adult X 5; b and c, nymphs; e, eggs. (After Lugger and Slingerland).

771 (1004). *PŒCILOCAPSUS LINEATUS* (Fabricius), 1798, 541.

Elongate-subparallel, male, elongate-oval, female. Head, front portion of pronotum and under surface reddish-yellow, basal half of pronotum greenish or lemon-yellow with four oblong black spots, the ones on sides narrower, sometimes wanting; elytra lemon-yellow, each with two black stripes, one submarginal, reaching cuneus, narrow at base, dilated toward apex, the other much wider, reaching from base of clavus to membrane; tip of tylus black; cuneus usually with a round median black spot; membrane brownish-translucent; legs yellow, apical third of femora with two black rings, basal third of hind tibiæ usually with one. Antennæ shorter than body, joints 1 and 2 black, their bases pale; 1 about as long as head, gradually slightly thickened from base to apex; 2 almost linear, slightly swollen toward apex, nearly three times as long as 1, thickly clothed with black bristle-like hairs; 3 and 4 fuscous, much more slender, united slightly shorter than 2, 3 twice the length of 4. Length, 7—7.5 mm. (Fig. 172).

Frequent throughout Indiana, May 20—July 8. Known as the “four-lined leaf-bug,” and in Indiana occurs on mullein, thistles, vervain, etc. Recorded from Jacksonville, Atlantic Beach and Lakeland, Fla. Ranges from Quebec and New England west to the Dakotas and British Columbia, and southwest to Florida, Texas and New Mexico. At times it becomes abundant enough to do much damage to the foliage of currants, dahlias, parsnips and other cultivated plants. Lintner (1882, 271) has given a full account of its life history and names 30 species of garden plants and weeds upon which it feeds.

771a (1005). *PŒCILOCAPSUS LINEATUS NIGRIGER* (Stal), 1862, 319.

Differs from typical *lineatus* only in being somewhat shorter and more oval, usually more greenish-yellow with dark stripes of elytra wider and a deeper black, and the spot on middle of cuneus larger and more prominent. Length, 6.5—7 mm.

Dunedin, Fla., Dec. 15—April 20. Frequent in spring on *Sida spinosa* L. and other herbs in low moist places. This is the form recognized by Van Duzee (1909, 178) from Florida as the *P. nigriger* Stal. Of it he says: “Not uncommon at all localities. This species has the head and anterior portion of pronotum bright fulvous and the cuneus has a large central black spot. Otherwise it differs little from our northern *lineatus* Fabr.” I consider it, as did Uhler (1884, 287), only a southern variety or race of *lineatus*. It was described from Mexico and has been recorded from California.

Division II.—CAPSARIA Douglas & Scott, 1865, 32.

The members of this division of the tribe Capsini are, for

the most part, oval, shining species with the upper surface, or at least the pronotum, distinctly punctate; antennæ shorter than body and collar and calli distinct. The division is represented in the eastern states by ten genera, separated as follows:

KEY TO EASTERN GENERA OF CAPSARIA.

- a. Joint 2 of antennæ clavate; cheeks swollen and convex; vertex broad, foveate, distinctly transversely striate each side near eyes. XIV. CAPSUS, p. 752.
- aa. Joint 2 of antennæ linear or nearly so.
- b. Second antennal thickened, nearly as thick as basal one, not, male, or but slightly, female, attenuate near base.
- c. Second antennal about twice as long as basal one, very finely pubescent. XV. NEOCAPSUS, p. 753.
- cc. Second antennal distinctly more than twice as long as basal one, thickly clothed with heavy black pubescence.
- d. Vertex convex, shining, its base not carinate; color in great part red; form suboval, distinctly widened behind middle. XVI. COCCOBAPHES, p. 754.
- dd. Vertex more flattened, its basal margin distinctly carinate; color, in part fuscous; body oblong, subparallel. XVII. LYGIDEA, p. 755.
- bb. Second antennal distinctly thinner at base than apex, always noticeably thinner than basal one.
- e. Pronotum in front of collar and between calli subconvex, not punctured.
- f. Beak reaching base of seventh ventral; front of head alutaceous, finely transversely striate; upper surface practically glabrous. XVIII. PLATYLYGUS, p. 757.
- ff. Beak rarely passing tips of hind coxæ; front of head without striæ, or if striate, the upper surface pubescent. XIX. LYGUS, p. 758.
- ee. Pronotum distinctly punctate in front of collar and between calli.
- g. Side margins of pronotum carinate; form more ovate.
- h. Joint 1 of antennæ distinctly thicker than joint 2, both joints black; color red and black. XX. TROPIDOSTEPTES, p. 784.
- hh. Joint 1 of antennæ slender, scarcely as thick as joint 2 at apex, both joints in part or wholly pale or reddish; eyes very large, overlapping front angles of pronotum.
- i. Corium smooth, opaque; vertex not margined at base; length less than 3 mm. XXI. CYRTOCAPSIDEA, p. 784.
- ii. Corium distinctly punctate; vertex carinate at base; length 4 or more mm. XXII. NEOBORUS, p. 785.
- gg. Side margins of pronotum not carinate; form more elongate, sides subparallel. XXIII. XENOBORUS, p. 792.

XIV. CAPSUS Fabricius, 1803, 241.

Short oval, rather robust species having the head porrect, nearly twice as wide at base as long, its front subvertical and

vertex foveate; beak reaching hind coxæ; pronotum trapezoidal, one-half wider at base than long, sides straight, not carinate, disk, except calli, thickly and coarsely punctate; scutellum triangular, almost flat, equilateral; elytra entire, surpassing abdomen, clavus, cuneus and membrane deflexed; hind tarsi with joints 1 and 2 subequal, 3 almost as long as both united. One species occurs in North America and our territory.

772 (1008). CAPSUS ATER (Linnæus), 1758, 447.

Oblong-oval. Male black or piceous-black, shining, sparsely clothed with fine prostrate grayish hairs; membrane brownish-translucent. Antennæ much shorter than body, joints 1 and 2 black, 3 and 4 fuscous, 3 pale at base; 1 as long as head; 2 strongly clavate, thickly pilose, three times as long as 1; 3 and 4 very slender, subequal, united one-fourth shorter than 2. Female often with head and pronotum reddish- or orange-yellow, var. *semiflavus* (Linn.). Length, 5.5—6 mm.

Marshall, Steuben and Marion counties Ind., June 11—18. Dunedin, Fla., Feb. 27 (*W. S. B.*). Palos Park, Ill., June 22 (*Gerhard*). Natick, Mass., May 11 (*Frost*). The specimens at hand are mostly the var. *tyrannus* Fabr., in which the legs are reddish yellow, the femora with two subapical dark brown rings and tips of tibiæ fuscous. Those from Indiana were swept from herbage in tamarack swamps or dense woodland. It is an introduced European species, its present known range in this country extending from Ontario and New England west to South Dakota and Edmonton, Alberta, and south to Florida, though Uhler (1878, 411) states that "it is found from the extreme north of British America to the southern parts of the United States." Knight states that the food plants are wire grass, *Poa compressa* L., couch grass, *Agropyron repens* (L.) and probably other grasses. Hussey recorded it as common in the hay fields and meadows of Berrien Co., Mich., during the early summer. Not before definitely recorded south of New Jersey.

XV. NEOCAPSUS Distant, 1884, 277.

Oblong-oval, shining species closely allied to *Horcias*, but having the pronotum and corium coarsely punctate; beak reaching hind coxæ; second joint of antennæ twice as long as first, but not strongly swollen or pilose; pronotum with humeral angles obliquely rounded, the hind margin twice as wide as apex; tibiæ strongly setose. A variety of one of the two known species occurs in our territory.

773 (—). *NEOCAPSUS CUNEATUS LEVISCUTATUS* Knight, 1925b, 79.

Shining black, subglabrous; front of head reddish, tylus in part black; pronotum and scutellum orange-red, the former with calli, narrow area behind collar and subbasal margin blackish; cuneus reddish-ochraceous. Pronotum shallowly and sparsely punctate. Scutellum wholly smooth. Length, 5.5—5.9 mm.

Recorded from Linnville Falls, N. Car., and Agricultural College, Miss. Distinguished from typical *cuneus* Distant (1893, 438) only by the smooth yellow scutellum, which in that species is black and "irregularly transversely striate."

XVI. *COCCOBAPHES* Uhler, 1878; 401.

Elongate-oval, widest behind middle; head about as wide as long, porrect, front vertical; beak reaching hind coxæ; pronotum subtrapezoidal, one-half wider at base than long, sides rounded, calli smooth and prominent, united at middle; disk behind them convex, densely and rather finely punctate; scutellum equilateral, feebly convex, its base broadly exposed; elytra entire, surpassing abdomen, cuneus acutely narrowed at tip; joint 2 of hind tarsi longer than 1, a little shorter than 3. One species is known.

774 (1009). *COCCOBAPHES SANGUINAREUS* Uhler, 1878, 401.

Color a nearly uniform bright red, sparsely clothed with semiprosstrate yellow hairs; tylus black; clavus rarely clouded with dusky each side of commissure; membrane translucent dusky, its veins reddish-brown; tibiæ and tips of beak and tarsi fuscous. Joints 1 and 2 of antennæ black, 3 pale yellow, 4 tinged with fuscous; 1 pale at base, slightly shorter than pronotum, feebly thickened from base to apex; 2 two and one-half times as long as 1, linear, male, its base and apex slightly narrowed, female; 3 and 4 very slender, subequal, together one-sixth shorter than 2. Elytra finely and densely rugose-punctate. Length, 7.5—8 mm.

Steuben, Tippecanoe, Marion and Putnam counties, Ind., June 5—July 24. Dunedin and Lake Okeechobee, Fla., March 2—23; not before recorded from that State. Occurs on foliage of hard and red maple. Ranges from Ontario and New England west to Michigan and Iowa and south to North Carolina and Florida. Uhler (loc. cit.) mentions a specimen from Canada as having "the inner half of hemelytra black from behind the base of the clavus along its whole breadth to the base of the membrane." He also records it from North Carolina, which is the only record south of New Jersey. Hussey found it common in June and July on hard maples in the dune forests of southern Michigan.

XVII. LYGIDEA Reuter, 1875a, 547.

Elongate or oblong, finely pubescent species having the head about as wide as long, porrect, its front vertical; beak reaching or passing the middle coxæ; antennæ stout, shorter than body, thickly pilose, joint 1 longer than head, 2 about three times as long as 1, 3 nearly half the length of 2, 4 usually more than half as long as 3; pronotum subtrapezoidal, its width of base slightly less than twice its greatest length, sides feebly sinuate, disk except calli and collar rather coarsely punctate; scutellum flat, mesoscutum but slightly exposed; elytra oblong-subparallel, entire, nearly flat, cuneus but slightly deflexed; joints 1 and 2 of hind tarsi subequal. Five of the seven known North American species occur in the eastern states.

KEY TO EASTERN SPECIES OF LYGIDEA.

- a. Beak scarcely reaching hind margins of middle coxæ.
- b. Length of first antennal not or but slightly greater than width of vertex; pubescence of elytra dense and closely appressed; cuneus chiefly red, upper surface of female usually in great part red.
 - 775. ROSACEA.
- bb. Length of first antennal two-fifths greater than width of vertex; pubescence of elytra less dense, chiefly suberect; cuneus mostly pale, red only along inner margin and apex.
- c. Basal half of pronotum rugose with fine punctures between the rugæ; antennæ dark brown; beak reaching behind the middle coxæ.
 - 776. RUBECULA.
- cc. Basal half of pronotum coarsely punctate; antennæ in great part black; beak not reaching hind margins of middle coxæ.
 - 777. VIBURNI.
- aa. Beak reaching between hind coxæ.
- d. Color chiefly fuscous-brown to blackish, ground color pale to greenish, never reddish.
 - 778. OBSCURA.
- dd. Color orange-red, clavus, inner half of corium and usually the basal margin of pronotum more or less fuscous to blackish.
 - 779. MENDAX.

775 (1010b). LYGIDEA ROSACEA Reuter, 1909, 46.

Greenish-yellow, usually heavily tinged with reddish, the elytra thickly pubescent with prostrate yellowish hairs; head with oblique red lines each side of front; pronotum dull red, the collar and an oblong median spot yellowish; scutellum red, a narrow median line and apex yellow; elytra with clavus and apical half of corium in great part reddish-fuscous, embolium and basal half and narrow costal margin of both corium and cuneus yellow; membrane dusky, its veins paler; legs greenish-yellow, the femora more or less reddish; joints 1 and 2 of antennæ reddish-yellow, the apex of 2 and all of 3 and 4 fuscous. Basal half of pronotum sparsely, coarsely, shallowly and unevenly punctate. Length, 6.5—6.7 mm.

Chicago and Willow Springs, Ill., June 4—30; at light and on willow (*Gerhard*). Described from there by Reuter as a variety of *rubecula* Uhl., and raised to specific rank by Knight (1923, 570). Known from Illinois, Minnesota and Colorado. Taken by Knight only on sand-bar willow, *Salix longifolia* Muhl.

776 (1010). *LYGIDEA RUBECULA* (Uhler), 1895, 37.

Dull greenish-yellow, sparsely clothed with very fine yellowish inclined hairs; head with tylus and usually a curved line each side of face, dark brown; pronotum with collar ivory-white, disk greenish-yellow, more or less tinged with reddish-brown, the basal fourth often with a narrow fuscous cross-bar, this projected forward over the basal angles and edged behind with paler; scutellum either yellow with sides narrowly darker or pale brown with median line and base yellow; elytra with clavus and inner half of corium fuscous-brown; outer half of corium and cuneus in great part yellow; membrane with cells dusky, paler toward apex, the veins yellowish; legs and under surface greenish-yellow. Length, 6—6.5 mm.

Highlands, N. Car., July 6 (*Brimley*). Described from Colorado and northern Illinois and recorded from various localities from Ontario and New England west to the Pacific, but part of the records undoubtedly refer to *rosacea*, *obscura* and other species.

777 (—). *LYGIDEA VIBURNI* Knight, 1923, 569.

Brownish-yellow, clothed with suberect yellowish pubescence; pronotum with calli, basal margin each side of median line and sometimes a ray each side of disk behind calli, dark brown to blackish; scutellum yellowish-brown, darker each side of median line; membrane fuscous-brown, veins and spots near apex of cuneus, paler; legs yellowish, apical third of femora often reddish-brown; ventrals pale yellowish, upper half of sides and genital region brownish-black. Antennæ brownish-black basally, fuscous apically, about two-thirds the length of body, joint 1 two-thirds as long as width of vertex; 2 three times as long as 1; 4 less than half the length of 3, male, three-fifths the length of 3, female. Length, 7 mm.

Batavia, N. Y., June 24 (*Minn. Univ. Coll.*). Recorded only from Batavia, where it breeds on the nanny-berry, *Viburnum lentago* L.

778 (1010c). *LYGIDEA OBSCURA* Reuter, 1909, 46.

Ground color of male dark fuscous to black, of female yellowish to brownish, darkened with fuscous; male with median line on front, cheeks, median line and narrow basal margin of pronotum, side margins and median line of apical half of scutellum, dull yellow; cuneus pale translucent, inner half reddish, apex darker; membrane blackish, veins and spot near tip of cuneus paler; legs blackish, the coxæ, basal half of

femora and middle of tibiæ paler; under surface dull yellow. Antennæ dark brown, joints 2—4 pilose, 3 two-fifths the length of 2, 4 one-half as long as 3. Pronotum short and broad, hind portion coarsely punctate. Female with head yellowish, the tylus and spot each side of vertex black; pronotum brownish, side margins broadly and a ray behind calli black, hind femora with blackish subapical band; otherwise like male. Length, 6 mm.

Honeoye Falls, N. Y., June 27 (*Minn. Univ. Coll.*). Known only from there and Lake Placid, N. Y. Occurs on black willow, *Salix nigra* L.

779 (1011). *LYGIDEA MENDAX* Reuter, 1909, 47.

Color as in key; tylus black; scutellum either wholly orange-red or with sides darker; membrane, hind tibiæ and first and second antennals fuscous; femora and front and middle tibiæ greenish; tarsi and third and fourth antennals dusky. Pronotum densely and rather finely rugose-punctate. Scutellum distinctly transversely striate. Clavus rugosely punctate; corium finely and closely so. Length, 6.3—6.5 mm.

Knox and Daviess counties, Ind., June 19 (*W. S. B.*). Henderson, Ky., June 11 (*Marshall*). Portage, N. Y., on *Cratægus* (*Gerhard*). Yaphank, N. Y., June 26 (*Davis*). Milford, Conn., June 4 (*Porter*). Occurs mainly on apple, quince, red haw, etc., and in the eastern states proving a serious pest to apple. The known range extends from New England west to Illinois and Kentucky. The pronotum in the Indiana specimens is without the usual blackish bar across the basal third, but this, as Reuter states (*non tamen semper*) is not an essential character as one would suppose by Knight's key (1923, 569).

XVIII. *PLATYLYGUS* Van Duzee, 1915, 111.

Oblong, shining species having the head half as wide as base of pronotum, nearly horizontal, its length subequal to width across eyes; vertex opaque, obliquely striate and with a short median sulcus, its basal carina slightly angulate at middle; pronotum transverse, moderately declivent, calli prominent, contiguous; elytra entire, sides parallel or nearly so, cuneus long, nearly horizontal; second joint of hind tarsi distinctly shorter than first or third. "Differs from *Lygidea* by the longer first joint of hind tarsi, more produced and subhorizontal head, opaque vertex with angled basal carina, longer basal joint of antennæ, longer rostrum, more slender pronotal collar and more irregular and distinct pronotal punctuation." (*Van Duzee*).

780 (1013). *PLATYLYGUS LURIDUS* (Reuter), 1909, 46.

Pale brownish-yellow, the upper surface sub-glabrous, strongly shining; collar and tip of scutellum dull yellow; elytra sub-translucent; disk of scutellum, apex and inner half of cuneus, apical halves of femora and ventrals often strongly tinged with reddish; membrane pale fuscous-brown, veins yellowish. Joints 1 and 2 of antennæ dull yellow, 1 surpassing tylus by half its length, 2 scarcely thinner and two and a half times as long as 1; 3 and 4 fuscous, distinctly thinner than and together about two-thirds the length of 2. Length, 6.5—7 mm.

Ithaca, N. Y., July 13 (*Minn. Univ. Coll.*). Recorded only from New Hampshire and New York. Occurs on white pine.

XIX. *LYGUS* Hahn, 1831, 147.

Oblong- or elongate-oval, usually finely pubescent species having the head porrect, inserted in thorax to eyes; face vertical, tylus prominent, higher than cheeks, its base on a line between the bases of antennæ; vertex, except in *pabulinus*, with a basal carina in front of which there is usually a subtriangular depression; eyes prominent, oval, their inner margins concave; beak reaching onto hind coxæ, rarely shorter (*campestris*) or longer (*approximatus*); antennæ shorter than body, finely pubescent, joint 1 shortest, 2 longest, usually slightly thickened on apical half, 3 and 4 much more slender; pronotum trapezoidal, broader at base than long, collar distinct, hind portion moderately convex, sides not margined, disk punctate except on calli and the smooth elevated area in front of them; scutellum equilateral, slightly elevated above clavus; elytra entire, passing tip of abdomen; cuneus oblong-triangular, rather strongly deflexed; tibiæ armed with spines whose length equals or surpasses the thickness of the tibia; first joint of hind tarsi very little longer than second. The genus is a very large one, about 60 species being known from North America, 39 of which occur in the eastern states.

KEY TO EASTERN SPECIES OF GENUS *LYGUS*.

- a. Beak reaching fourth ventral; pronotum rather closely, finely and shallowly punctate; collar and tip of scutellum white; male very slender and nearly black. 781. *APPROXIMATUS*.
- aa. Beak not surpassing second ventral.
 - b. Length of second antennal less than or scarcely equalling width of head across eyes; basal carina of vertex very low; color yellowish-brown to dark reddish-brown, darkened with fuscous. 782. *RUBICUNDUS*.
 - bb. Length of second antennal greater than width of head.

- c. Second antennal distinctly shorter than width of pronotum at base; head very broad, its width more than one-half that of pronotum at base.
- d. Smaller, length not over 4.5 mm.; general color dull greenish-yellow. 783. FASCIATUS.
- dd. Larger, length 5.8 mm.; general color dark reddish with black markings. 784. SUPERIORENSIS.
- cc. Second antennal longer than width of pronotum at base, or if not, then the head not conspicuously broad and length of insect more than 4.5 mm.
- e. Vertex with basal carina obsolete, represented by an impressed line at middle, apparent only near eyes; color a uniform green, or greenish-yellow fading to dull straw-yellow; membrane with an inverted Y-shaped fuscous mark. 785. PABULINUS.
- ee. Vertex with basal carina distinct; color variable.
- f. Pronotum coarsely or at least distinctly punctate; body covering heavily chitinized; left genital clasper of male without a prong at middle; right clasper with a curved claw at tip which is shorter than the greatest width of clasper (fig. 173, A).
- g. Beak reaching to or near posterior margins of hind coxæ.
- h. Color chiefly green, often with reddish lines; tibiæ pale greenish, not annulated near base; eyes very large, in male nearly twice as long as wide. 786. APICALIS.
- hh. Color yellowish-brown to blackish or reddish; tibiæ annulated with darker near base.

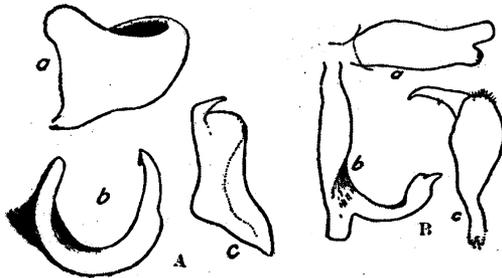


Fig. 173. A; genital claspers of male of *Lygus pratensis* (Linn.); B, same of *Lygus (Neolygus) communis* Knight. a, left clasper, side view; b, left clasper, dorsal view; c, right clasper, internal side view. (After Knight, Hemiptera of Connecticut).

- i. Elytra blackish, irregularly mottled with small yellowish pubescent spots; head and front part of pronotum yellowish-green, the pronotum usually with two blackish dots or rays behind each callus. 787. FLAGIATUS.
- ii. Elytra sometimes dark, but not mottled with paler; head and pronotum otherwise colored.
- j. Pubescence of upper surface distinct; smaller, length 4.8—6 mm.; color variable. 788. PRATENSIS.
- jj. Nearly glabrous, strongly shining; larger, length 6.5—7.5 mm.; color greenish- or brownish-yellow, sometimes ruby-red; pronotum with a black dot behind each callus and a black spot near basal angles. 789. VANDUZEEI.

gg. Beak not surpassing hind margins of middle coxæ; scutellum bright yellow or greenish-yellow; length less than 4.5 mm.

790. CAMPESTRIS.

ff. Pronotum very finely punctate; body covering more thinly chitinized and therefore more fragile; left clasper of male with prong at middle, right clasper with an apical hook or prong, this as long as or longer than thickest part of clasper (fig. 173, B).

Subgenus NEOLYGUS, p. 767.

781 (1029). *LYGUS APPROXIMATUS* (Stal), 1858, 185.

Male—Elongate, slender, sides subparallel. General color black; collar and tip of scutellum white; narrow basal margin and lower margin of flanks of pronotum and inner basal angle of cuneus, dull yellow; tips of embolium and cuneus reddish-brown; membrane fuscous, basal half of cells and a spot beyond apex of cuneus, pale, veins reddish; legs yellowish to greenish, hind femora tinged with fuscous or reddish-brown; ventrals black. Joints 1 and 2 of antennæ greenish-yellow, 1 two-fifths longer than width of vertex; 2 three and two-third times longer than 1; 3 and 4 fuscous, 3 one-half as long as 2; 4 two-thirds the length of 3. Head very long, front subvertical, basal carina of vertex prominent. Pronotum shallowly, rather sparsely punctate. Basal half of scutellum rather coarsely transversely rugose. Elytra minutely punctate, finely scabrous. *Female*—More robust than male. Dark reddish to brownish; tylus black; pronotum with sides and usually the basal margins fuscous to blackish; femora and ventrals dull yellow, tinged with reddish. Head longer and less deflexed than in male; second antennal only three times longer than first. Length, 4.8—5 mm.

Whiteface Mountain, N. Y., Aug. 22 (*Minn. Univ. Coll.*). Ranges from Nova Scotia and New England west to British Columbia and Alaska. Occurs in July and August on golden-rod, especially on the slopes of mountains north of latitude 44°; also on hemlock.

782 (1037). *LYGUS RUBICUNDUS* (Fallen), 1829, 92.

Oblong-oval, rather robust. Dark reddish-brown, rather thickly clothed with fine silvery-gray or yellowish appressed pubescence which on the elytra is often condensed to form small spots; head greenish-yellow, the tylus and some streaks on vertex reddish; basal half of pronotum usually blotched with fuscous, this often in the form of four to six short, broad stripes, the edge of hind margin pale yellow; scutellum more or less tinged with fuscous, a vague median line paler, the extreme tip ivory-white; apical half of corium and sometimes the clavus usually heavily tinged with fuscous; cuneus and basal half of embolium yellowish-translucent, edges and tip of cuneus often reddish; membrane dusky, the cells darker, veins yellowish; antennæ reddish-brown, apical third of joint 2 fuscous; legs reddish-brown, apical third of femora with two dark rings; under surface usually fuscous, the prosternum, middle of ventrals 1—4, a stripe along sides and spiracles pale, sometimes, especially in females, with under surface and legs wholly reddish-brown.

Head short and broad. Joints 1 and 2 of antennæ short and stout; 1 slightly shorter than width of vertex, 2 nearly three times as long as 1, 3 and 4 slender, subequal in length, united one-fifth shorter than 2. Beak reaching base of hind coxæ. Pronotum nearly twice as wide at base as long, disk, except calli, also the scutellum, finely transversely rugose, shallowly punctate between the rugæ. Elytra finely and closely punctate. Length, 4.7—5.2 mm.

Marshall and Marion counties, Ind., June 24—Sept. 28; frequent on weeds and willows along the banks of White River (*W. S. B.*). Washington, D. C., and Columbus, Ohio, July (*Gerhard*). Bloomsburg, Pa., and Fairfax Co., Va., June—September (*Davis*). A European species ranging in this country from Ontario and New England west to the Pacific and southwest to Georgia and Texas. Uhler (1892, 183) redescribed it as *Hadrodemna pulverulenta* and stated that it often occurred in gardens on the blossoms of privet, *Ligustrum vulgare* L. Knight found it breeding in June near Batavia, N. Y., on the peach-leaved willow, *Salix amygdaloides* Anders, and also in scattering numbers on other willows.

783 (1023). *LYGUS FASCIATUS* Reuter, 1876, 72.

Oblong-oval. Dull greenish-yellow, rather thickly clothed with semi-prostrate fine yellowish hairs; scutellum reddish, the median line and tip usually paler, sometimes green or yellow with only a few red dots on sides (var. *viridiusculus* Knight); inner half of clavus and inner apical angles of corium reddish-piceous; membrane dusky marbled with paler; legs pale yellow, hind femora with apical half reddish, a narrow preapical ring and knees pale, basal fifth of tibiæ usually red. Head very broad with eyes large, overlapping front angles of pronotum as in *Dichrooscytus*. Joints 1 and 2 of antennæ greenish-yellow, the latter more than three times as long as 1, its apex blackish, 3 dusky, paler at base, 4 fuscous, one-half as long as 3. Pronotum and scutellum finely transversely strigose, with minute punctures between the strigæ. Elytra finely, densely, evenly punctate. Length, 4—4.5 mm.

Mineral Springs, Lake Co., Ind., Oct. 2 (*Gerhard*). Sanford, Dunedin, Ft. Myers, Miami, R. P. Park and Istokpoga, Fla., Nov. 19—April 23 (*W. S. B.*). Common about Dunedin in late autumn and early spring both on the mainland and Hog Island; occurring on low herbage in waste moist places, on the foliage of the groundsell tree, *Baccharis halimifolia* L., and at porch light. Described from South Carolina and ranges from New England and New York southwest to Florida, Texas and the West Indies. The *Lygus olivaceus* Reut. (1907b, 6), described from Jamaica, is a synonym, probably based on the female of *fasciatus* and the previous Florida records have been under that

name. Knight records it as breeding on the button-bush, *Cephalanthus occidentalis* L. Among the 42 specimens at hand there are all gradations between typical *fasciatus* and the so-called var. *viridiusculus* Knight (1917, 600).

784 (—). *LYGUS SUPERIORENSIS* Knight, 1917, 572.

Oblong-oval. Head black; curved basal carina of vertex pale, loræ and tylus dark red; disk of pronotum reddish, sides reddish-brown, calli black, inner half of each with a reddish spot; scutellum reddish-black, tip pale; elytra dark reddish translucent, tips of embolium and cuneus and spot on latter near embolium blackish; membrane pale hyaline, apical half of cells brownish, veins reddish; femora reddish-brown, twice annulate with blackish near tips; tibiæ reddish-brown, tips, spines and spot near knees darker; tarsi reddish-brown, tips blackish; sternum black, opaque; ventrals dark reddish. Beak reaching third ventral. Second antennal two-thirds longer than width of head across eyes. Pronotum finely punctate, strongly shining. Scutellum coarsely punctate, transversely rugose. Upper surface sub-glabrous. Length, 5.8 mm.

Known from a single male taken at Sault Sainte Marie, Mich.

785 (1014). *LYGUS PABULINUS* (Linnæus), 1761, 253.

Elongate-oval. Color as in key, sparsely clothed with minute inclined brownish hairs; membrane pale translucent, usually (var. *signifer* Reut.) with a fuscous mark in apical third of the large cell and a V-shaped mark beyond it, the two forming a crude inverted Y; spines of tibiæ and tips of tarsi fuscous. Head relatively small and pointed, vertex convex, shining. Antennæ with joint 1 and basal half of 2 greenish, remainder fuscous; 1 two-thirds the length of pronotum, 2 more than three times the length of 1, 3 nearly two-thirds the length of 2, one-third longer than 4. Pronotum very finely and densely rugose-punctate. Scutellum minutely transversely strigose. Elytra with minute rather sparse, shallow punctures. Length, 6—6.5 mm.

Marion and Putnam counties, Ind., June 5—Sept. 1; in the former swept from its host plant, the jewel-weed or touch-me-not, *Impatiens biflora* Walt., growing along the margins of White River. A palæartic European species ranging in this country from Quebec and New England west to Michigan, British Columbia and Alaska, and southwest to the mountains of North Carolina. The membrane is sometimes wholly pale with veins green. Easily known by the lack of basal carina of vertex and uniform green color.

786 (1024). *LYGUS APICALIS* Fieber, 1861, 275.

Elongate-oblong, male, more oval, female. Color pale green fading to greenish-yellow, very sparsely clothed with minute yellow hairs; scutellum, clavus and corium often with a few scattered fuscous or

brownish lines or spots; membrane pale translucent with a vague fuscous spot in the apical third of each cell and two or three others behind the cells; tips of cuneus, beak and tarsi fuscous; antennæ reddish-yellow, the apex of 2 and joints 3 and 4 fuscous; legs greenish-yellow, the apical third of hind femora with faint reddish or fuscous rings or blotches; under surface greenish, often with narrow reddish or fuscous lines on sides. Beak reaching first ventral. Joint 1 of antennæ slightly less than two-thirds the length of pronotum, 2 four times the length of 1, 3 one-half the length of 2, one-third longer than 4. Pronotum with calli indistinct, disk behind them finely rugosely minutely punctate. Scutellum minutely transversely strigose. Elytra very finely, thickly and shallowly punctate. Length, 4.8—5.2 mm.

This is the most common Mirid in southern Florida, both on mainland and islands, hibernating beneath boards and other cover and in fall and spring swept from flowers and herbage along roadsides and borders of marshes. At R. P. Park it was frequent in December on weeds along the borders of tomato fields, and in March on herbage along the borders of the everglades. Fully one-fourth of the specimens taken from goldenrod and other flowers in spring are very prettily marked with red, the extremes having four stripes on pronotum, a broad stripe enclosing a yellow spot each side of scutellum, a stripe on sides of ventrals, some lines on front and middle femora and two bars on hind femora of the red hue. It is a cosmopolitan species, ranging in this country from New England southwest in the coast-wise states to Florida and Texas. Recorded also from Missouri, California and the West Indies. Breeds on the horse-weed, *Leptilon canadense* (L.). According to Knight the *L. prasinus* Reut. (1876, 72) was based on green forms of *L. apicalis*, while the American records of the European species, *L. contaminatus* (Fall.) and *L. lucorum* (Meyer), should also be referred to *apicalis*.

787 (1035). *LYGUS PLAGIATUS* Uhler, 1895, 35.

Oblong-oval. Fuscous or greenish-black; head dark greenish-yellow, the vertex often with a median black stripe; pronotum glabrous, greenish-yellow, usually with a dot on each callus, a dot or ray behind it, and the hind margin and posterior angles, blackish, sometimes the whole disk blackish; scutellum either black with two discal spots and tip yellow or yellow with base, two median lines and side margins black; clavus and corium with numerous small yellowish pubescent spots and dots; cuneus yellowish-translucent, the inner basal angles and tip black; membrane with cells black, remainder dusky, veins paler; legs greenish-yellow, femora annulate on apical third with dark rings; tibiæ with spines, a ring near base and tips fuscous; tips of tarsi and beak blackish. Joint 1

of antennæ brownish-black, but little longer than width of vertex; 2 three times as long as 1, greenish-yellow, its extreme base and apical fourth blackish; 3 fuscous, paler at base, nearly twice as long as 1; 4 fuscous, slightly shorter than 3. Pronotum, except calli, coarsely and evenly punctate. Scutellum strongly transversely strigose. Clavus rugosely punctate, corium densely granulate-punctate. Female usually paler than male with second antennal about one-eighth shorter. Length, 5.5—6 mm.

Marion, Vigo and Knox counties, Ind., June 13—Oct. 17; common in autumn on flowers of goldenrod and ragweed, one on the later date beneath a log. Natick, Mass., June 5 (*Frost*). Ranges from Quebec and New England west to Missouri and California. Not recorded in the east south of the District of Columbia. Breeds on the great ragweed, *Ambrosia trifida* L.

788 (1031). *LYGUS PRATENSIS* (Linnæus), 1758, 448.

Oblong-oval. General color dull reddish or brownish-yellow marked with blackish; head glabrous with three or four dark reddish or piceous

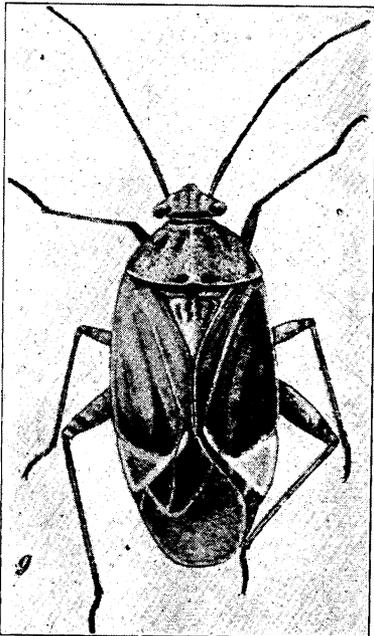


Fig. 174. *Lygus pratensis* L., X 10.
(After Weiss).

stripes; pronotum almost glabrous, the collar, narrow edge of all the margins, median line and two abbreviated stripes each side pale greenish-yellow, a submarginal line and four stripes alternating with the yellow ones, blackish; scutellum blackish with a Y-shaped mark, including apex, yellowish-white; elytra finely pubescent, clavus and corium usually reddish-brown, the former with a fuscous blotch at middle, the latter with apical third more or less fuscous, claval vein and embolium pale yellow; cuneus yellowish-translucent, the inner basal angle and apex reddish, extreme tip piceous; membrane dusky with faint white blotches, cells darker, veins paler; femora reddish-brown, spotted or annulate with paler; tibiæ greenish or reddish-yellow, their tips and a ring near base darker; tips of tarsi and beak piceous; ventrals blackish with a pale stripe along sides. Antennæ blackish, joint 2 usually with a pale ring at basal fourth; joint

1 slightly longer than width of vertex, 2 nearly three times longer than 1, 3 three-fifths the length of 2, one-sixth longer than 4. Disk of pronotum behind calli, coarsely, deeply and unevenly punctate. Clavus rather

coarsely rugose-punctate; corium more finely and densely so. Length, 5—6 mm. (Fig. 174).

This species, known as the "tarnished plant-bug," is in late summer and autumn the most common Mirid throughout Indiana, and in late spring and early summer is exceeded in numbers only by the "meadow plant-bug," *Miris dolobrata* (L.). The adults hibernate beneath rubbish and have been taken on the wing as early as April 2. In summer and fall they occur by hundreds on weeds and grasses along roadsides, borders of fields and all waste places, in late autumn being especially abundant on the white-heath aster, *Aster ericoides* L., in old fallow fields. It is a palæarctic species, ranging over all of Canada and the United States and southward into Mexico. A full account of its life history, food habits, etc., is given by Crosby & Leonard (1914).

A half dozen or more color varieties of *L. pratensis* have been named. The one above described is the *Capsus oblineatus* of Say (1832, 21; I, 340), considered a synonym of *pratensis* by Van Duzee and other authors, but raised to varietal rank by Knight (1917, 564). Three other color varieties which Knight recognizes as occurring in the eastern states he separates by the following key:

KEY TO COLOR VARIETIES OF *LYGUS PRATENSIS* L.

- a. Chiefly blackish, but streaked with yellowish; head blackish, but with four longitudinal yellowish marks on front.
 - 788a. var. STRIGULATUS.
- b. Color chiefly bright red, pronotum with a black spot behind each callus; scutellum pale, middle of base and often a line each side red.
 - 788b. var. RUBIDUS.
- c. Hemelytra pale, apical area of corium bright red; scutellum yellow, marked with black only at middle of base.
 - 788c. var. RUBROSIGNATUS.

788a (—). *LYGUS PRATENSIS* STRIGULATUS Walker, 1873, 94.

Form and size of *pratensis*. Upper surface mainly piceous-black; head with pale lines as in key; yellow lines of pronotum very narrow; scutellum black with two spots and apex yellow; elytra dark reddish-brown and fuscous without pale markings; basal three-fourths of second antennal reddish-brown.

This variety occurs throughout Indiana with the one previously described, but is less common. A specimen from Swannanoa, N. Car., was received from Brimley, and its range in this country is probably the same as that of the typical form.

788b (—). *LYGUS PRATENSIS RUBIDUS* Knight, 1917, 565.

General color as in key; joints 1 and 2 of antennæ red, apex of 2 and all of 3 and 4 fuscous; cuneus margined with red, pale at middle; tibiæ pale reddish-yellow, spines black. Length, 5.5 mm.

Kawishiwi River, Minn., Aug. 28 (*Minn. Univ. Coll.*). Recorded elsewhere only from Maine, New Hampshire and Massachusetts. The variety *rubrosignatus*, as distinguished in key, is known only from Massachusetts.

789 (—). *LYGUS VANDUZEEI* Knight, 1917, 565.

Elongate-oval, large and robust for the genus. Greenish-yellow to reddish-brown; head usually unicolorous, sometimes with red or brown lines; pronotum marked with black as in key, sometimes with two dots behind each callus and rarely with dark stripes on disk; scutellum with tip and an oblique spot each side of basal half yellow, sometimes wholly pale yellow; corium often with a fuscous bar across apical third, the anal ridges yellowish; embolium in great part pale, its entire outer edge blackish; claval vein and cuneus yellowish, the latter with extreme base and tip reddish-brown; membrane pale translucent with a slight dusky tinge, sometimes largely fuscous-brown, veins yellowish or reddish; legs greenish-yellow, more or less tinged or dotted with brownish or reddish, the basal halves of hind femora reddish or blackish; under surface greenish-yellow, the ventrals more or less clouded with reddish or brownish, and usually with a stripe of similar hue along their sides. Joint 1 of antennæ reddish-brown to piceous, one-half the length of pronotum; 2 bright reddish-brown, the apical third piceous, four-fifths as long as basal width of pronotum; 3 and 4 dark brown to fuscous, united slightly longer than 2. Pronotum, except calli, coarsely, sparsely and irregularly punctate. Scutellum transversely rugose. Elytra rather coarsely and closely punctate. Length, 6.5—7.5 mm.

Kenosha, Wis. (*Gerhard*). Linville Falls, Swannanoa and Craggy Mts., N. Car., June to September (*Brimley*). Oliverea, N. Y., Sept. 10 (*Davis*). The known range is northern, extending from Nova Scotia and New England west to North Dakota and southwest to the mountains of North Carolina. Knight says that in New York it breeds on the Canada goldenrod, *Solidago canadensis* L., the adults hibernating and appearing on the tender goldenrod plants during May. "The eggs are doubtless stuck in the tender stems, where the nymphs appear and feed during July. Most of the adults mature by the middle of August and continue to feed on the host plant until the cool September nights cause them to seek hibernation quarters." A slightly smaller form (6.6 mm.), bright ruby-red in color, the pronotum and antennæ marked with blackish as in typical *vanduzeei*, was named var. *rubroclarus* by Knight (1917, 567).

It occurs in Nova Scotia, Quebec, New England and New York. Part of the North Carolina specimens at hand are intermediate in color between the two forms.

790 (1036). *LYGUS CAMPESTRIS* (Linnæus), 1758, 448.

Oblong-oval. Greenish-brown or brownish-yellow thinly clothed with rather long yellowish prostrate hairs; head dull yellow; apical half of tylus and lower half of cheeks often fuscous; pronotum with a transverse spot behind calli, a round one on basal angles and a sub-basal cross-bar fuscous, these markings often obsolete; elytra dull straw-yellow to fuscous-brown, clavus and inner apical third of corium usually darker; embolium pale yellow, its outer edge darker; cuneus dull yellow, the apex and inner basal angle fuscous; membrane pale translucent with a faint dusky tinge; legs greenish-yellow, the apical third of hind femora vaguely annulate with darker; tibial spines and tips of beak and tarsi piceous. Joint 1 of antennæ yellow or brown, its length less than width of vertex, remaining joints dark brown, 2 three and a third times the length of 1, 3 less than half the length of 2, slightly longer than 4. Pronotum, except calli, finely, closely but distinctly punctate. Scutellum vaguely transversely rugulose. Clavus coarsely, closely punctate, corium more finely and shallowly so. Length, 4—4.2 mm.

Marion and Putnam counties, Ind., May 1—Oct. 6; swept from its host plants, the poison hemlock, *Conium maculatum* L., and other Umbelliferæ. Palisades, N. J., and Batavia, N. Y., July—August (*Davis*). A European species, ranging in this country from Newfoundland and New England west to Alaska and the Pacific. Not recorded in the east south of the District of Columbia. Injurious at times to celery. Van Duzee says that near Buffalo, N. Y.: "It is common May to August, on flowers of Umbelliferæ. It may frequently be found in winter hibernating beneath loose bark of elm and other trees; the scutellum is then often a bright clear green." The *Orthops scutellatus* Uhler (1877, 420) is a synonym.

Subgenus *NEOLYGUS* Knight, 1917, 561.

The species belonging to this group or subgenus are oblong- or elongate-oval, with the integument or body covering more flimsy or delicate in character than in those preceding; pronotum usually much more finely transversely rugose, often almost indistinctly punctate; scutellum almost always finely transversely strigose without evident punctures. The principal character used by Knight in separating them was, however, that pertaining to the genital claspers of male as set forth in the key, p. 760, and shown in fig. 173, B. As the number of

known eastern species in the subgenus is 29, they are, for convenience, separated into three groups.

KEY TO GROUPS OF EASTERN SPECIES OF SUBGENUS NEOLYGUS.

- a. Pronotal disk greenish or yellowish to brownish and (except in males of *tiliæ* and *hirticulus*) without distinct dark spots or rays.
- b. Color of upper surface chiefly greenish, often fading to greenish-yellow; sometimes darkened on clavus and apical third of corium, but the ground color green. GROUP I, p. 768.
- bb. Color distinctly yellowish or brownish, more brownish than green. GROUP II, p. 771.
- aa. Pronotal disk blackish or marked with dark rays. GROUP III, p. 778.

GROUP I.—SUBGENUS NEOLYGUS.

KEY TO EASTERN SPECIES OF GROUP I, SUBGENUS NEOLYGUS.

- a. Tibial spines with fuscous spots at base.
- b. Corium with fuscous spot on inner apical angle; clavus greenish-yellow, more brownish near scutellum and suture. 791. CONFUSUS.
- bb. Corium never infuscated but with dilute bronze on inner half; clavus and basal half of pronotum distinctly bronzed. 792. ALNI.
- aa. Tibial spines without fuscous spots at base.
- c. Upper surface uniformly greenish; extreme inner apical angle of corium with a fuscous mark; basal area of membrane with a transverse fuscous bar; length, 5.2—5.7 mm. 793. NEGLECTUS.
- cc. Upper surface green, but apical third of corium and usually the clavus in part distinctly brownish or reddish-brown, sometimes dark brown or fuscous.
- d. Apical half of membrane with a median longitudinal line or ray, this often widened apically; inner apical third of corium with a triangular dark brownish spot; clavus usually in part brownish; length, 5.6—6 mm. 794. BELFRAGII.
- dd. Membrane never with longitudinal fuscous ray as above; smaller, length not more than 5.5 mm.
- e. Second antennal with apical one-fifth or more fuscous; general color pale greenish-yellow or yellowish-brown; clavus and dark spot on apical half of corium brownish-black; femora greenish-yellow, the apical third of hind ones banded with fuscous. 795. CANADENSIS.
- ee. Second antennal never distinctly fuscous near apex.
- f. Scutellum darkened with fuscous; clavus more or less fuscous; corium with a triangular dark patch before apex; females with dark markings much reduced; length, 4.6—5 mm. 796. TILIÆ.
- ff. Scutellum pale yellow; clavus with inner half dark brown; membrane with apical half pale, but with submarginal fuscous spot each side of middle and a third near tip of cuneus. 797. INCONSPICUUS.

791 (—). *LYGUS CONFUSUS* Knight, 1917, 606.

General color greenish-yellow, the basal third of pronotum and sides of scutellum yellowish-brown; inner half of clavus brownish, inner apical angles of corium with a fuscous spot, cuneus translucent; membrane fuscous, veins and basal half of cells paler; legs greenish-yellow, hind femora with minute fuscous dots on lower side and two vague subapical fuscous rings above; fuscous spots at base of fibial spines prominent. Joints 1 and 2 of antennæ greenish-yellow to brownish, 1 two-thirds as long as pronotum, 2 three and one-third times the length of 1; 3 and 4 pale fuscous, 3 slightly more than half the length of 2, one-half longer than 4. Beak reaching first ventral. Length, 4.3—5.3 mm.

Recorded only from Maine, New Hampshire and New York.

792 (—). *LYGUS ALNI* Knight, 1917, 607.

Bright green fading to yellowish, with bronze markings as in key; scutellum dark green with a tinge of bronze; membrane pale brown, apical third of cells and spot near apex of cuneus darker; legs greenish, tips of tibiæ and tarsi yellowish-brown, very small spots at base of tibial spines fuscous; under surface green to yellowish-green. Joints 1 and 2 of antennæ wholly yellowish, 1 twice as long as width of vertex, 2 three and one-fifth times as long as 1; 3 and 4, pale fuscous, 3 one-half as long as 2, 4 three-fourths the length of 3. Beak reaching tips of hind coxæ. Length, 5.5—5.7 mm.

Beaver Bay, Minn., Aug. 20 (*Minn. Univ. Coll.*). Recorded from Nova Scotia, New Hampshire and New York. Breeds on the hoary alder, *Alnus incana* Willd. Reuter's New England records (1909, 42) of the European *L. viridis* (Fall.) were based on specimens of this form. Cabinet specimens fade to pale brownish-yellow and resemble closely those of *L. fagi*.

793 (—). *LYGUS NEGLECTUS* Knight, 1917, 619.

Bright green or yellowish-green; head, calli and under surface yellow; membrane pale hyaline, its base clouded with fuscous; legs greenish-yellow, tibiæ green with dull yellow spines, the hind pair somewhat curved. Joint 1 of antennæ greenish-yellow, male, bright green, female, as long as pronotum; 2 greenish-yellow, brownish at tip, three times as long as 1; 3 and 4 dark brownish, 3 one-half the length of 2, twice as long as 4. Beak reaching middle of hind coxæ. Length, 5.2—5.6 mm.

Recorded from Massachusetts, Alabama and Louisiana. Breeds on the water beech, *Carpinus caroliniana* Walt. Resembles *L. pabulinus* (Linn.), but shorter, broader and with a distinct basal carina on vertex.

794 (1018). *LYGUS BELFRAGII* Reuter, 1876, 71.

Greenish or greenish-yellow, fading in great part to greenish- or pale straw-yellow, thinly clothed with fine prostrate yellowish hairs; head and pronotum unicolorous, or the basal half of latter sometimes lightly

tinged with bronze; scutellum pale greenish-yellow; corium and membrane with fuscous-brown as in key, each cell of latter with a small apical fuscous spot; clavus often with a vague brown blotch along the base of commissure; embolium and cuneus wholly pale translucent yellow; legs and under surface a uniform pale greenish or straw-yellow. Antennæ in great part straw-yellow, very finely pubescent, joints 3 and 4 dusky; joint 1 about two-thirds the length of width of head across eyes; 2 usually fuscous toward apex, three and a third times the length of 1; 3 one-half the length of 2; 4 two-thirds as long as 3. Basal half of vertex with a short median sulcus. Pronotum and scutellum, finely transversely rugose, without visible punctures. Elytra finely and closely punctate. Length, 5.6—6 mm.

Batavia, N. Y., July 31 (*Gerhard*). Known from Ontario and New England west to Pennsylvania. "In western New York it breeds abundantly on mountain maple, *Acer spicatum* Lam., and to some extent on dockmakie, *Viburnum acerifolium* L., and alternate-leaved dogwood, *Cornus alternifolia* L. It is also frequently attracted to the flowers of poison hemlock, *Conium maculatum* L., for feeding, and in this way 58 specimens were taken on July 31." (*Knight*).

795 (—). *LYGUS CANADENSIS* Knight, 1917, 634.

Color as in key, basal third of pronotum and margins of scutellum sometimes brownish; embolium pale yellowish; membrane fuscous, base of cells and small area near tip of cuneus paler; legs and ventrals yellowish to yellowish-brown, tips of tarsi fuscous. Antennæ dull yellow; joint 1 two-thirds as long as pronotum; 2 three times the length of 1; 3 and 4 tinged with fuscous, 3 three-fifths as long as 2, one-half longer than 4. Beak reaching between hind coxæ. Elytra finely and closely punctate. Length, 5.4—5.6 mm.

Recorded from Parry Sound, Ontario; New York, New Jersey and Wisconsin. A color variety, having a blackish ray behind each callus, was named *binotatus* by Knight.

796 (—). *LYGUS TILLÆ* Knight, 1917, 613.

Greenish-yellow, rather thickly pubescent with appressed yellowish hairs. Male with basal portion of pronotum, scutellum and clavus almost wholly, and inner half of apical third of corium, dark fuscous-brown; female with pronotum wholly pale, dark markings of scutellum and clavus usually vague and dark blotch of corium paler and reduced in size; embolium and cuneus yellowish-translucent; membrane with base and cells dusky, paler toward apex; legs and under surface greenish-yellow, ventrals of male with a dusky tinge. Joints 1 and 2 of antennæ greenish-yellow; 1 three-fifths the length of pronotum; 2 slightly more than three times the length of 1; 3 dusky toward apex, more than half the length of 2; 4 wholly fuscous, two-thirds the length of 3. Basal half of vertex with a short median groove. Sculpture of pronotum, scutellum and elytra as in *belfragii*. Length, 4.6—5 mm.

Portage, N. Y., June 27 (*Davis and Gerhard*). The known range extends from Ontario and New England west to southern Michigan. Knight states that it breeds abundantly on the linden, *Tilia americana* L., the young hatching with the unfolding of the leaves and maturing in late June. The females deposit their eggs in the twigs during July and disappear by the end of that month. Adults are frequently attracted to the flowers of the smooth sumac, *Rhus glabra* L. It probably occurs in those parts of Indiana where the linden grows. A variety *heterophyllus*, uniform pale green in hue, the female with shorter beak, has been named by Knight (1918c, 44). It is known from Georgia and Mississippi, where it occurs on the silver-leaf linden, *Tilia heterophylla* Vent.

797 (—). *LYGUS INCONSPICUUS* Knight, 1917, 612.

Pale green, fading to greenish-yellow, thinly clothed with fine yellowish pubescence; clavus with a vague pale brownish to fuscous blotch along its inner half, this reaching only to base of commissure; inner apical third of corium in great part fuscous or brownish, this hue sometimes extending to outer margin of embolium, thus forming a more or less complete dark cross-bar; membrane pale translucent, tips of cells and two spots behind them pale fuscous; legs green, spines of tibiæ and tips of tarsi and beak brownish. Joint 1 of antennæ green, one-third longer than width of vertex; 2 green, dusky near tip, its length equal to width of base of pronotum; 3 and 4 fuscous, 4 about two-thirds the length of 3. Head very short, face nearly vertical. Beak reaching first ventral. Pronotum minutely rugosely shallowly punctate; calli scarcely evident. Elytra finely scabrous. Length, 4.5—5.2 mm.

Marion, Putnam and Orange counties, Ind., May 30—June 3; swept from herbage in dense woodlands (*W. S. B.*). Willow Springs, Ill., July 3 (*Gerhard*). The known range extends from Connecticut west to Indiana and southwest to Georgia. Breeds on wild grape.

GROUP II.—SUBGENUS NEOLYGUS.

KEY TO EASTERN SPECIES OF GROUP II, SUBGENUS NEOLYGUS.

- a. Beak scarcely reaching tips of middle coxæ; color rich yellowish-brown, slightly darker on clavus and apically on corium.
- b. Second antennal yellowish, infuscated at apex, its length greater than width of pronotum at base. 798. *VIBURNI*.
- bb. Second antennal not fuscous at apex, its length less than width of pronotum at base. 799. *NYSSÆ*.
- aa. Beak reaching beyond tips of middle coxæ.
- c. Tylus with apical half black; two bands on apical third of hind femora, sides of body and head in part, reddish.

800. *ATRITYLUS*.

- cc. Tylus not black, or if so, then body and bands on femora not reddish.
- d. Hind femora not distinctly biannulated with dark and pale near apex; second antennal rarely fuscous near tip, if so the annuli on femora indistinct.
- e. Scutellum infuscated and with a pale median line on apical half; upper surface dark greenish-brown to blackish; ventral surface with a lateral dark fuscous stripe its full length; femora dark, the knees paler. 801. INVITUS.
- ee. Scutellum sometimes dark, but without pale median line.
- f. Elytra either uniformly reddish-brown, rich brown or fulvæneous, or pale brown flecked with yellowish.
- g. Joint 3 of antennæ more than one-half the length of 2; color above and beneath not pale brown flecked with yellowish.
- h. Elytra and femora yellowish-bronzed in both sexes; membrane distinctly infuscated. 802. FAGI.
- hh. Elytra and femora brownish-yellow to blackish, male, uniformly rich brownish, female; membrane of female a uniform yellowish, of male, usually infuscated. 803. HIRTICULUS.
- gg. Joint 3 of antennæ only one-fourth the length of 2; color above and beneath pale brown flecked with pale yellow. 804. IRROATUS.
- ff. Elytra not colored as in *f*, the clavus in part and apical half of corium darker than scutellum and basal half of corium.
- i. Second antennal fuscous toward apex; clavus and apical fourth or more of corium dark brownish; embolium, outer basal half of corium and cuneus pale translucent; length, 6—6.5 mm. 805. OSTRYÆ.
- ii. Second antennal uniformly colored, never fuscous toward apex.
- j. Length of second antennal scarcely exceeding width of pronotum at base; beak scarcely reaching tips of hind coxæ; elytra yellowish-brown to greenish-yellow, an apical spot on corium, inner margin of clavus and commissure dark brown to blackish. 806. CLAVIGENITALIS.
- jj. Length of second antennal much exceeding width of pronotum at base; beak reaching onto first ventral; clavus and corium in part dark brownish. 807. GENESENSIS.
- dd. Hind femora distinctly biannulated with dark and pale near apex; second antennal fuscous toward apex.
- k. Femora and usually the sides of under surface, distinctly reddish; apical third of hind femora annulated with pale and dark reddish; pronotal disk rarely wholly blackish. 808. QUERCALBÆ.
- kk. Femora and sides of under surface dark brown to fuscous; apical third of hind femora annulate with dark fuscous. 809. OMNIVAGUS.

798 (—). LYGUS VIBURNI Knight, 1917, 609.

Brownish-yellow, thinly clothed with short fine prostrate yellow hairs; entire clavus and apical third of corium a darker brown; sides of pronotum, entire scutellum, cuneus and basal two-thirds of embolium,

pale yellowish; membrane fuscous-brown, the veins scarcely paler; legs pale brownish-yellow, the apical third of femora with two darker rings, tips of beak and tarsi piceous-brown; under surface straw-yellow, the genital segment and a stripe on sides of ventrals dark brown, male, wholly pale with ventrals only tinged with darker, female. Joint 1 of antennæ yellowish, three-fifths as long as pronotum; 2 as in key, three and a half times longer than 1; 3 and 4 fuscous-brown, 3 half the length of 2, 4 two-thirds as long as 3. Pronotum, except the inconspicuous calli, finely, shallowly, rugosely punctate. Scutellum minutely transversely strigose. Clavus and corium finely scabrous or granulate-punctate. Length, 5.2—5.8 mm.

Batavia, N. Y., June 15—20 (*Gerhard and Davis*). Recorded only from Vermont, Connecticut and New York. "Breeds on the nanny-berry, *Viburnum lentago* L., the adults being most common on the old plants. The nymphs hatch with the unfolding of the leaves and continue to feed on the tender foliage. Close to *genesensis*; differs in male claspers, in being more robust, in shorter beak, in apical half of second antennal being infuscated and having in general a richer yellowish-brown color." (*Knight*).

799 (—). *LYGUS NYSSÆ* Knight, 1918c, 43.

Pronotum and scutellum yellowish-brown; clavus and apical half of corium darker brown, thickly clothed with yellowish pubescence; embolium and narrow outer margin of corium pale yellowish; membrane fuscous, paler near cuneus, veins brownish; legs a nearly uniform straw-yellow, femora often tinged with reddish; ventrals yellowish, sides and genital region slightly darker. Joints 1 and 2 of antennæ yellowish, 1 one-half as long as pronotum, 2 three times the length of 1; 3 and 4 fuscous-brown, 3 slightly more than one-half as long as 2, twice as long as 4. Length, 5.4—5.6 mm.

Lyme, Conn., June 16 (*Walden*). Recorded only from that State and Alabama. Breeds on sour gum, *Nyssa aquatica* L.

800 (—). *LYGUS ATRITYLUS* Knight, 1917, 606.

Greenish-yellow to brownish, thinly clothed with very fine prostrate yellowish hairs; head pale brownish-yellow, shining, flecked with reddish spots and dashes; pronotum, scutellum and elytra greenish or pale brownish-yellow, more or less tinged or spotted with reddish, inner half of clavus and apical fourth of corium often in part pale fuscous; embolium, cuneus and outer half of corium pale translucent; membrane tinged with dusky, often with a blackish inverted Y at base, usually with pale submarginal spots at middle; legs and under surface greenish-yellow, femora flecked with reddish spots, tibial spines arising from fuscous spots as in *L. abni*; sides of ventrals with a reddish stripe. Joints 1 and 2 of antennæ pale brownish-yellow, joint 1 nearly one-third longer than width of vertex, 2 three and a third times longer than 1; 3 and 4 in great part

fuscous, 3 almost three-fifths the length of 2, 4 two-thirds as long as 3. Beak reaching base of first ventral. Pronotum and elytra minutely indistinctly punctate. Length, 5.2—5.4 mm.

Wanakena, N. Y., July 15 (*Gerhard*). Known from New England, New York and Colorado. Drake (1923, 74) records it as very common on willow in moist shady situations in the Cranberry Lake region of New York.

801 (1020). *LYGUS INVITUS* (Say), 1832, 24; I, 345.

Dark greenish or reddish-brown to blackish, thinly clothed with fine prostrate yellow hairs; pronotum often with sides more or less fuscous-brown, disk with a greenish-yellow median line, this sometimes entire, more distinct in the darker males; clavus and apical two-thirds of corium usually darker than pronotum; basal half of embolium and entire cuneus pale translucent yellow; membrane fuscous with ill defined paler spots toward apex; legs greenish-yellow, the apical half or more of hind femora darker; tips of tarsi and beak piceous; under surface dull greenish-yellow, the sides with a broad fuscous stripe reaching from hind margin of propleura to genital plate. Joints 1 and 2 of antennæ greenish- or brownish-yellow, 2 tinged with dusky toward apex, more than three times the length of 1; 3 and 4 wholly fuscous, united equal in length to 2, 4 three-fifths the length of 3. Pronotum with calli evident, but not prominent, smooth, shining, disk behind them finely strigose with minute punctures between the strigæ. Elytra scabrous and very finely punctate. Length, 5—5.7 mm.

Marion Co., Ind., June 4—30, swept from foliage of poison ivy and elm. Described by Say from Indiana. Its recorded range extends from Quebec and New England west to North Dakota and southwest to Kansas and New Mexico, but some of the western records are doubtless to be referred to other species. Knight states that *invitus* breeds mainly on elm, preferring always the young thrifty plants with succulent shoots. The nymphs are pale greenish, hatching soon after the leaves appear in spring from eggs that were inserted in the twigs the previous July. The adults all disappear by the first of August.

802 (—). *LYGUS FAGI* Knight, 1917, 603.

Color a nearly uniform pale brownish-yellow, strongly shining, thinly clothed with fine prostrate yellowish hairs; clavus a slightly darker shade of pale brown; entire corium and cuneus a pale translucent yellow; membrane with a dusky tinge, the veins paler; tips of beak and tarsi fuscous. Beak reaching base of first ventral. Antennæ pale yellowish-brown, the apical joints faintly tinged with fuscous; joint 1 as long as head, 2 three times as long as 1, 3 three-fifths the length of 2, 4 two-thirds as long as 3. Pronotum, except calli, finely closely but distinctly

punctate; calli small, scarcely evident. Scutellum finely transversely rugose. Elytra scabrous or minutely strigose-punctate. Length, 4.6—4.8 mm.

Steuben County, Ind., June 15; swept from herbage in a tamarack swamp (*W. S. B.*). Rock City, N. Y., July 4 (*Davis* and *Gerhard*). Ashland, Mass., May 2 (*Frost*). Known heretofore only from New England and New York. Breeds on beech and yellow birch, *Betula lutea* Michx. It is said to prefer cool shady locations, the eggs hatching in early spring, the adults maturing in late June and disappearing by Aug. 1. This species resembles *hirticulus* closely, but is somewhat smaller, with general color paler, the male no darker than the female and membrane more uniformly dusky.

803 (1019). *LYGUS HIRTICULUS* Van Duzee, 1916, 41.

Head and pronotum usually uniformly dull greenish-yellow or pale reddish-brown, in some males in part or almost wholly fuscous-black; elytra and membrane as in key, cuneus pale translucent to brownish; legs greenish-yellow or pale straw-yellow; under surface of the same hue, the sides often with a vague reddish stripe. Antennæ greenish-yellow, faintly tinged with dusky toward apex, joint 1 two-thirds the length of pronotum, 2 three and a half times the length of 1, 3 and 4 united slightly shorter than 2, 4 two-thirds the length of 3. Pronotum with disk, except calli, finely rugose-punctate. Scutellum and clavus finely transversely strigose. Corium minutely scabrous. Length, 4.8—5.5 mm. (Fig. 186, *b*).

Marion Co., Ind., May 31—July 14; beaten from foliage of maple. Ranges from Maine and Massachusetts west to Michigan and Indiana. Recorded also by Van Duzee from Crescent City and Sevenoaks, Fla. Knight has reared specimens from chestnut, beech and woodbine.

804 (—). *LYGUS IRRORATUS* sp. nov.

Elongate-oval. Pale brown, flecked above with numerous scattered spots of pale yellow, more thickly beneath with smaller spots of the same hue, the pale spots less evident on clavus and corium than on other parts above; membrane pale hyaline, veins yellowish; legs pale yellow, both femora and tibiæ vaguely marked with small brown spots. Joint 1 of antennæ yellow with three or four reddish-brown dots, three-fourths as long as width of vertex; 2 dull yellow, four and a half times as long as 1; 3 and 4 dusky, 3 one-fourth the length of 2, 4 two-thirds as long as 3. Upper surface thinly clothed with fine inclined yellowish hairs. Beak reaching hind coxæ. Pronotum twice as wide at base as at apex, hind portion rather strongly convex, thickly and finely transversely strigose with minute punctures between the strigæ; hind margin broadly rounded. Scutellum similarly strigose. Clavus and corium finely and shallowly rugose-punctate. Length, 3.8 mm.

R. P. Park, Fla., March 17; one female swept from roadside herbage. Differs from all our other species in the peculiar mottling of both upper and lower surfaces and in the short third and fourth antennals.

805 (—). *LYGUS OSTRYÆ* Knight, 1917, 635.

Pale brownish-yellow, thinly clothed with fine prostrate yellowish hairs; clavus and a bar across apical fourth of corium a darker brown; membrane with base and cells in great part fuscous, apical portion dusky; legs and under surface greenish-yellow, a stripe on sides of ventrals, tips of beak and tarsi and sometimes two bands on apical third of hind femora, darker. Antennæ very slender, joint 1 and basal two-thirds of 2 pale straw-yellow, apical third of 2 fuscous, 3 and 4 dusky yellow; 1 three-fourths as long as width of head across eyes, 2 three times as long as 1, 3 nearly one-half the length of 2, 4 three-fifths the length of 3. Pronotum and scutellum finely transversely rugose, the former with the punctures between the rugæ scarcely evident. Elytra finely scabrous. Males with two unusually large upturned prongs of the left genital clasper. Length, 6—6.5 mm.

Parry Sound, Ontario, and Portage, N. Y., June 27—Aug. 7. (*Davis and Gerhard*). Known only from Ontario, New England and New York. Breeds on the hop hornbeam, *Ostrya virginiana* (Mill.).

806 (—). *LYGUS CLAVIGENITALIS* Knight, 1917, 632.

Pronotum yellowish-brown, paler on sides; scutellum yellowish, the margins brownish; color of elytra as in key; embolium and cuneus pale yellowish translucent, more or less tinged with green; membrane fuscous-brown, veins and a vague spot near tip of cuneus paler; legs and under surface yellowish or greenish, hind femora often tinged with brown. Joint 1 of antennæ straw-yellow, one-third as long as width of base of pronotum; 2 yellowish-brown, as long as pronotum; 3 and 4 pale fuscous, 3 nearly two-thirds as long as 2, 4 two-thirds the length of 3. Vertex with basal carina prominent. Pronotum shallowly and finely punctate. Length, 4.8—5.1 mm.

Litchfield, Conn., July 22 (*Walden*). Recorded only from New England and Maryland. Occurs at times on *Abnus rugosa* (DuRoi). "The females are likely to be confused with those of *tiliæ* and *inconspicuus*, but *tiliæ* is more green, particularly the pronotum, and the scutellum is darkened with fuscous; *inconspicuus* is more greenish with fuscous marks on clavus and apex of corium more in contrast." (*Knight*).

807 (—). *LYGUS GENESEENSIS* Knight, 1917, 609.

Dull greenish to straw-yellow, thickly clothed with conspicuous subprostrate yellowish pubescence; clavus and inner half of corium dark brownish, outer half of corium greenish-yellow tinged with brownish;

embolium and cuneus pale translucent yellow; membrane dusky translucent, with some vague spots across the middle darker; legs pale straw-yellow; under surface pale brown. Joints 1 and 2 of antennæ wholly yellowish, 3 and 4 tinged with fuscous; 1 nearly three-fourths as long as width of head across eyes, 2 three times as long as 1, 3 three-fifths as long as 2, 4 three-fifths the length of 3. Pronotum relatively short and wide, nearly twice as wide at base as long, finely rugose-punctate. Elytra finely scabrous. Length, 5 mm.

Portage, N. Y., June 22 (*Gerhard*). Long Island, N. Y., June 27 (*Davis*). Ranges from Massachusetts west to Missouri. Breeds on white oak, *Quercus alba* Linn.

808 (—). *LYGUS QUERCALBÆ* Knight, 1917, 624.

Pale reddish-brown or brownish-yellow thinly clothed with prostrate yellowish hairs; head usually with a series of oblique transverse reddish lines each side of front and vertex; calli and basal half of pronotal disk often more or less tinged with fuscous; scutellum pale straw-yellow, the sides slightly darker; clavus and apical half of corium dark brown, the brown of the latter often forming a bar reaching across the embolium, this sometimes with outer portion reddish; cuneus pale translucent, the tips often reddish; membrane pale fuscous, paler on middle of sides, veins yellowish or reddish; legs pale yellow, femora marked with reddish, hind ones with apical two-thirds in great part reddish to fuscous; ventrals greenish-yellow with a pale stripe on sides bounded within by fuscous, without by reddish. Antennæ with joint 1 and basal two-thirds of 2 straw-yellow, apical third of 2 and all of 3 and 4 tinged with fuscous; 1 two-thirds as long as width of head across eyes, 2 three times the length of 1, 3 nearly half the length of 2, 4 half as long as 3. Pronotum finely closely and shallowly rugose-punctate. Elytra finely scabrous. Length, 5.7—6.2 mm.

Lake and Marion counties, Ind., May 24—Aug. 14; beaten from white oak (*W. S. B.*). Glen Ellyn and Willow Springs, Ill., May 30—June 10 (*Gerhard*). Pine Island, N. Y., June 19 (*Davis*). The known range extends from Massachusetts and Connecticut west to Wisconsin and south to Virginia. Breeds on white oak, usually in some abundance, and its distribution is probably much more extensive than at present recorded. Knight states that in New York the nymphs hatch with the bursting of the oak buds, and feed thereafter on the tender foliage. The adults mature in early June and deposit their eggs in the twigs of the host plant, where they remain over winter.

809 (—). *LYGUS OMNIVAGUS* Knight, 1917, 627.

Very similar in form, size and color to *quercalbæ*. Differs in lacking the red markings of head, embolium, legs and under surface; membrane pale hyaline, apical half of cells, and three spots toward apex fuscous; hind femora with apical third fuscous-brown; ventrals with a vague

dark brown stripe along sides and with pale pubescence prominent. Joints 3 and 4 of antennæ each about one-fourth longer than in *quercalba*, 3 being more than half the length of 2, and 4 three-fifths as long as 3. "Genital claspers of male very distinctive, the broad upcurved sinistral clasper extending beyond the tip of body and easily seen without a lens." Length, 5.5—6 mm.

Dunedin, Fla., March 18—April 27, adults and nymphs beaten from wild cherry; the first record for the State (*W. S. B.*). Long Island, N. Y., June 26 (*Davis*). Glen Ellyn, Ill., June 19; Pentwater, Mich., July 14 (*Gerhard*). Ranges from Ontario and New England west to Michigan and Illinois and southwest to North Carolina and Florida. Breeds on several species of oak, also on dogwood, chestnut and maple-leaved arrow-wood. Of the female of *omnivagus* Knight says: "Usually paler than the male, more yellowish-brown; never with reddish as in *quercalba*, nor with fuscous marks on the pronotum as in *semivittatus* or in *caryæ* var. *subfuscus*; very similar to *canadensis*, but that species has the apical one-third of antennal segment ii more distinctly black, the fuscous spot on apex of corium smaller and not invading the pale embolium."

GROUP III.—SUBGENUS NEOLYGUS.

KEY TO EASTERN SPECIES OF GROUP III, SUBGENUS NEOLYGUS.

- a. Disk of pronotum blackish, rarely with distinct rays; hind femora blackish with pale rings near apex; elytra, except cuneus, blackish, the costal margin scarcely paler; cuneus pale translucent, its apex fuscous. 810. *CARYÆ*.
- aa. Disk of pronotum with distinct dark rays or spots behind the calli.
 - b. Hind femora with two blackish or pale rings on apical third.
 - c. Joints 1 and 2 of antennæ black; embolium, outer half of corium and cuneus pale translucent. 811. *JOHNSONI*.
 - cc. Joint 1 of antennæ pale or only slightly brownish; apical portion of embolium and outer half of corium usually darkened, if not, then joint 1 of antennæ distinctly pale.
 - d. Sides of body, and usually the hind femora, distinctly reddish. 812. *COMMUNIS*.
 - dd. Sides of body and femora not reddish.
 - e. First and second antennals yellowish; clavus, apical half of corium and embolium blackish. 813. *PARROTTI*.
 - ee. Second antennal distinctly fuscous toward apex; head and legs usually slightly tinged with reddish; calli and a widening ray behind each callus blackish. 814. *PARSHLEYI*.
- bb. Hind femora with apical half brownish to black but without distinct rings, the apex or knees only pale.
 - f. Scutellum greenish-yellow with median line fuscous or reddish; apex and inner margins of cuneus, femora and more or less of sides of ventrals reddish. 815. *UNIVITTATUS*.