

black; hemelytra rather uniformly fusco-brownish; hind femora banded with blackish before apices, anterior face more or less blackish on apical half.

This species was described by Reuter as a variety of *rubecula* Uhler but proves on examination to be a distinct species. The female type is now contained in the collection of E. P. VanDuzee.

Food plant: *Salix nigra*.

Allotype: Male, 27 June, 1916, Honeoye Falls, N. Y. (H. H. Knight); author's collection.

New York.

*L. mendax* Reuter. Light apple red bug. (Pl. xvi, 16.)

Acta Soc. Sci Fenn., xxxvi, No. 2, 47, 1909.

Cornell Univ. Agr. Expt. Sta., Bull. 291, 1911.

Length 6.4 mm., width 2.2 mm.; bright orange-red; tylus, apically on rostrum, antennae, each side of median line on scutellum, clavus, inner half of corium and cuneus, and membrane, dark fuscous to black; legs greenish to fuscous.

Food plants: *Crataegus*, *Pyrus coronaria*, cultivated apple, and to some extent on cultivated quince. This insect is now regarded as a serious pest on apples in New York and Pennsylvania.

Milford, 26 June, 1916 (W. E. B.); New Haven, 15, 23, 25 June, 1914 (B. H. W.) (M. P. Z.); Wallingford, July (D. J. C.); Washington, 24 June, 1914 (Mrs. G. H. Vaillant).

### *Coccobaphes* Uhler.

*C. sanguinarius* Uhler. (Pl. xvi, 17.)

Proc. Bost. Soc. Nat. Hist., xix, 401, 1878.

Length 7.5 mm., width 3.4 mm.; bright red; dusky for a space either side of the hemelytral commissure; membrane, first two segments of antennae, tibiae, and apices of tarsi, black; segment iii of antennae pale, segment iv fuscous.

Food plants: Sugar maple (*Acer saccharum*), and occasionally red maple (*A. rubrum*); breeds most abundantly on second growth or young trees.

Hamden, 18 June, 1919 (M. P. Z.); Hartford, 26 June (W. M.); Litchfield, 20 June, 1908 (L. B. W.); New Haven, 12 June, 1902 (W. E. B.); 23 June, 1905 (B. H. W.); South Meriden, 27 June, 1914 (H. L. J.).

### *Capsus* Fabricius.

*C. ater* (Linnaeus).

*Cimex ater* Linnaeus, Syst. Nat., Edn. 10, 447, 1758.

Saunders, Het. Brit. Isds., 262, pl. 24, fig. 5, 1892.

Reuter, Hem. Gymn. Eur., v, 14, 357, 1896.

Length male 5.7 mm., width 2.6 mm.; female, length 5.8 mm., width 3.1 mm.; uniformly black, moderately shining; pronotum shallowly, but rather coarsely punctate; clothed with pale to yel-

lowish pubescence; easily distinguished by the clavate antennal segment ii.

Food plants: *Poa compressa*, *Agropyron repens*, and probably other grasses.

Berlin, 30 June, 1905 (W. E. B.); Branford, 27 June, 1904 (H. L. V.); 13 June, 1920 (B. H. W.); Guilford, 14 June, 1920 (B. H. W.); Mount Carmel (Hamden), 22 June, 1908 (W. E. B.); Lyme, 16 June, 1920 (B. H. W.); Middlebury, 16 June, 1911 (B. H. W.); New Haven, 30 May, 1 June, 1911, 10 June, 14 June, 16 June, 1920 (B. H. W.), 24 June, 1905 (W. E. B.); North Branford, 15 June, 1920 (M. P. Z.); Southington, 5 July, 1905 (B. H. W.); Suffield, 21 June, 1920 (M. P. Z.).

**C. ater** var. **tyrannus** (Fabricius).

*Lygaeus tyrannus* Fabricius, Ent. Syst., iv, 177, 1794.

Reuter, Hem. Gymn. Eur., v, 15, 1896.

Similar to the typical form but with legs fulvous or reddish; femora with two dark subapical annuli, sometimes obscured on basal half; apices of tibiae fuscous.

**C. ater** var. **semiflavus** (Linnaeus).

*Cimex semiflavus* Linnaeus, Syst. Nat., Edn. 12, i, 725, 1867.

Reuter, Hem. Gymn. Eur., v, 15, 1896.

Similar to variety *tyrannus* but with the fulvous color extending to cover pronotum and head.

Canaan, 14 June, 1916 (M. P. Z.); Cornwall, 20 June, 1920 (K. F. C.); Greenwich, 23 June, 1916 (M. P. Z.); Hamden, 2 June, 1911 (A. B. C.); New Haven, 30 May, 1911 (B. H. W.).

### Platylygus Van Duzee.

**P. luridus** (Reuter).

*Lygidea rubecula* var. *lurida* Reuter, Acta Soc. Sci. Fenn., xxxvi, No. 2, 46, 1909.

Bull. Brook. Ent. Soc., xiii, 16, 1918.

**Male:** Length 6.5 mm., width 2.4 mm.; minutely pubescent, the dorsum practically glabrous; pale yellowish brown, hemelytra strongly translucent, collar and tip of scutellum pale to white; apex and inner half of cuneus, brachium, disk of scutellum, apically on femora, and more or less on venter, becoming reddish; antennal segments iii and iv infuscated, apex of rostrum piceous, membrane fumate or pale brownish.

**Female:** Length 7 mm., width 2.7 mm.; more robust than the male but very similar in structure and coloration.

Food plant: *Pinus strobus*. The nymphs are yellowish with a tinge of brownish, thus very closely matching the color of the bud scales.

New Hampshire, New York.

### Lygus Hahn.

#### Key to Species.

1. Rostrum not or scarcely exceeding apices of hind coxae ..... 2
- Rostrum attaining middle of venter; pronotum sparsely and shal-

- lowly punctate; collar and tip of scutellum white; female usually reddish and with fuliginous on pronotum, male very slender and nearly black ..... (p. 574) *approximatus*
2. Length of antennal segment ii exceeding width of head ..... 3  
Length of antennal segment ii less than or scarcely equaling width of head; basal carina scarcely raised from base of vertex; ovate, robust, yellowish brown to dark reddish brown and darkened with fuscous ..... (p. 575) *rubicundus*
3. Length of antennal segment ii exceeding width of pronotum at base, or if not, then the head not particularly broad and length of insect exceeding 4.5 mm. .... 4  
Length of antennal segment ii scarcely equaling width of pronotum at base; head unusually broad for size of insect, equal to more than one-half the width of pronotum at base; eyes large; small, form ovate, length 4-4.5 mm. .... (p. 579) *fasciatus*  
(a) Scutellum dark red or ferruginous, median line, or at least the apex, paler; anal area of membrane infuscated variety *fasciatus* typical  
(b) Scutellum bright green, with not more than two or three dots of red at lateral margins; anal area of membrane not distinctly infuscated ..... variety *viridisculus*
4. Vertex with basal carina entire; variously colored ..... 5  
Vertex with basal carina obsolete in the middle, apparent only at corners of eyes and from thence an impressed line extends to near center of vertex; green or greenish yellow, fading to dull yellowish; Y-shaped fuscous mark formed by anal area of membrane, usually with a longitudinal cloud distad of the areoles ..... (p. 579) *pabulinus*
5. Pronotum coarsely, or at least distinctly punctate; body integuments heavily chitinated; adults hibernate; right genital clasper of male with claw at tip, curving ventrad or caudad, in length less than greatest width of clasper; left clasper without prong at middle (at posterior extremity of lateral aspect) ..... 6  
Pronotum very finely punctate; body integuments more thinly chitinated, more fragile forms; adults do not hibernate; right genital clasper of male with an apical hook or prong projecting mesad, its length as great as or greater than thickest part of the clasper; left clasper with a prong at middle ..... (p. 580) subgenus *NEOLYGUS*
6. Rostrum reaching to near posterior margins of hind coxae ..... 7  
Rostrum just attaining posterior margins of middle coxae; scutellum bright yellow or green ..... (p. 575) *campestris*
7. Color yellowish brown to blackish, or reddish; tibiae annulated with darker near base ..... 8  
Color chiefly green; tibiae pale greenish, without annuli at base; eyes large ..... (p. 578) *apicalis*
8. Hemelytra blackish and irregularly mottled with greenish yellow; head and anterior part of pronotum yellowish green, usually with two black rays behind each callus ..... (p. 578) *plagiatus*  
Hemelytra sometimes dark but not mottled with paler; head and pronotum otherwise colored ..... 9
9. Smaller forms, length 4.8-6 mm.; distinctly pubescent ..... (p. 575) *pratensis*  
(a) Yellowish brown with more or less blackish markings, or reddish brown with fuscous; pronotum with yellowish and blackish rays; hemelytra reddish brown or blackish, streaked with yellowish or gray ..... variety *oblineatus*  
(b) Chiefly blackish but streaked with yellowish; head blackish but with four longitudinal yellowish marks on front ..... variety *strigulatus*

- (c) Color chiefly bright red, pronotum with a black spot behind each callus; scutellum pale, marked with red at middle of base ..... variety *rubidus*  
 (d) Hemelytra pale, apical area of corium bright red; scutellum yellow, marked with black only at middle of base ..... variety *rubrosignatus* n. var.  
 Larger forms, length 6.5-7.3 mm.; nearly glabrous, strongly shining ..... (p. 577) *vanduzeei*  
 (a) Yellowish brown to rich brown and fuscous ... typical *vanduzeei*  
 (b) Chiefly bright ruby red ..... variety *rubroclarus*



FIG. 97. *Lygus approximatus* Stål,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, external lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 98. *Lygus rubicundus* Falen,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

### *L. approximatus* (Stål).

*Deraeocoris approximatus* Stål, Stet. Ent. Zeit., xix, 185, 1858.  
 Cornell Univ. Agr. Expt. Sta., Bull. 391, 597, 1917.

**Male:** Length 5 mm., width 1.8 mm.; head strongly produced downward, carina prominent, nearly straight, vertex with an impressed triangle just in front; rostrum reaching to middle of venter; slender, nearly black, collar and tip of scutellum white; membrane infuscated, veins reddish; cuneus and membrane only slightly deflected, thus giving the appearance of an *Orthotylus*; genital claspers distinctive of the species (fig. 97).

**Female:** Length 4.9 mm., width 1.8 mm.; dark brownish with fuliginous; tylus black, frequently darkened over the whole front; pronotum darkened with fuliginous on the base and along lateral margins of disk, in some forms much darker, rarely the whole pronotum may be nearly black as in the male; collar and tip of scutellum white, very narrow basal margin of disk pale; sternum and pleura chiefly fuliginous; venter, hind femora, and often the intermediate femora, strongly reddish.

Occurs on hemlock (*Tsuga canadensis* L.); frequently attracted to the flowers of *Solidago macrophylla*.

Maine, New Hampshire, New York.

**L. rubicundus** (Fallen).

*Phytocoris rubicundus* Fallen, Hemip. Suec., 92, 1829.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 589, 1917.

**Male:** Length 4.5 mm., width 2.14 mm.; ovate, robust, dark reddish brown to fuscous; antennal segment ii shorter than width of head; genital claspers very distinctive of the species (fig. 98).

**Female:** Very similar to the male in structure but usually not so darkly colored.

Breeds on *Salix amygdaloides*, also occurs to some extent on other willows.

Portland, 25 July, 8 Aug., 1913 (B. H. W.).

**L. campestris** (Linnaeus).

*Cimex campestris* Linnaeus, Syst. Nat., Edn. 10, 448, 1758.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 592, 1917.

**Male:** Length 4.1 mm., width 1.77 mm.; ovate, rather small, greenish brown or brownish yellow with fuscous, scutellum bright yellow or green; genital claspers distinctive of the species.

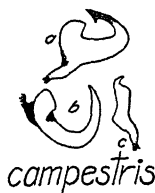


FIG. 99. *Lygus campestris* Linnaeus,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 100. *Lygus pratensis* Linnaeus,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**Female:** Slightly more robust than the male, antennal segment ii more slender; very similar to the male in coloration.

Breeds on *Conium maculatum*, also on other plants of the family Umbelliferae.

Branford, 28 July, 1905 (H. W. W.); Colebrook, 21 July, 1905 (H. L. V.); New Haven, 2 June, 1908 (B. H. W.); Orange, 3 Apr., 1905 (W. E. B.).

**L. pratensis** Linnaeus var. **oblineatus** (Say). Tarnished plant bug. (Pl. xvi, 15.)

*Capsus oblineatus* Say, Heter. N. Harm., 21, 1832; Compl. Writ., i, 340, 1859.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 564, 1917.

**Male and female:** Length 4.9-5.5 mm., width 2.5 mm.; ovate, shining, yellowish brown with more or less blackish marking, or

reddish brown and fuscous; pronotum with yellowish and blackish rays; scutellum margined with blackish, leaving a Y- or heart-shaped area yellowish; hemelytra reddish brown or blackish, streaked with yellowish or gray.

This is the commonest species of the family Miridae in the eastern United States and is found everywhere frequenting many kinds of plants. It is a pest on nursery stock, ornamental plants, and cultivated crops.

Common throughout the state.

**L. pratensis** var. **strigulatus** (Walker).

Walker, Cat. Heteroptera, vi, 94, 1873.

A very dark form of *pratensis*, having all pale markings much reduced; head blackish but with four longitudinal yellowish marks on front.

New Haven, 9 Nov., 1919 (H. C. Fortner).

**L. pratensis** var. **rubrosignatus** Knight, new variety.

Apparently not differing appreciably from the typical *pratensis*, but somewhat smaller and having a different color aspect.

*Male*: Length 5.4 mm., width 2.47 mm. Head: Pale to yellowish, more or less tinged with reddish, tips of juga and sometimes spot above base of antenna, blackish. Antennae nearly black, segment ii somewhat brownish at middle.

Pronotum: Pale to yellowish, calli except inner half, extending rather broadly to anterior angles of disk, and two short rays behind each callus, black; basal angles infuscated, a black ray just above coxal cleft. Scutellum yellow, black at middle of base, the dark color sometimes extending to middle of disk; mesoscutum black but narrowly exposed.

Hemelytra: Pale translucent, tip of clavus and more or less broadly on apical area of corium, bright red; clavus becoming brownish black bordering scutellum; cuneus pale translucent, apex scarcely infuscated, inner margin slenderly red. Membrane pale fuscous, slightly paler on middle and bordering tip of cuneus; veins red or becoming reddish.

Legs: Pale to yellowish, femora with two blackish, subapical bands.

Venter: Yellowish, genital segment becoming infuscated on lower side at base.

*Female*: Length 4.9 mm., width 2.48 mm.; very similar to the male but more broadly pale; antennal segment ii black but showing brown at middle; each callus with spot on outer basal angle and another just behind middle on disk, black; tip of clavus and a small spot at apex of corium bright red.

Holotype: Male, 15 July-6 Aug., 1917, Woods Hole, Massachusetts (Chris E. Olsen); author's collection. Allotype: same data as type. Paratypes: Male, topotypic. Male, 9 Aug., 1911, Nantucket, Mass. (C. W. Johnson).

**L. pratensis** var. **rubidus** Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 565, 1917.

*Male*: Length 5.5 mm., width 2.5 mm.; bright ruby red; pronotum with a small black spot behind each callus; antennal segments red, with apex of segment ii, and all of segments iii and iv, blackish; scutellum pale, marked with red at middle of base; cuneus margined with red but pale translucent in the middle; ostiolar orifice and a longitudinal stripe on sides of venter paler; tibiae pale reddish, spines black; sternum beneath, and tips of tarsi, blackish. Maine.

**L. vanduzeei** Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 565, 1917.

*Male*: Length 7.1 mm., width 3.3 mm.; larger than *pratensis*, nearly glabrous, strongly shining, yellowish brown to rich brown with fuscous; genital claspers distinctive of the species (fig. 101).

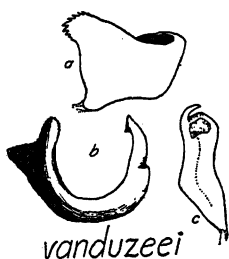


FIG. 101. *Lygus vanduzeei* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 102. *Lygus plagiatus* Uhler,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

*Female*: Very similar to the male in size and coloration.

Colebrook, 19 June (P. G.); Cornwall, 4 June (K. F. C.); Danbury, 29 Aug. (B. H. W.); New Haven, 27 July (B. H. W.); Portland, 24 July, 1921 (B. H. W.).

**L. vanduzeei** var. **rubroclarus** Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 567, 1917.

Length 6.6 mm., width 2.9 mm.; structurally very similar to *vanduzeei* but differing greatly in general appearance; slightly smaller than the typical *vanduzeei* but larger than *pratensis*; bright ruby red, shining; pronotum and antennae marked with blackish as in *vanduzeei*.

Norfolk, 5 June (M. P. Zappe).

**L. plagiatus** Uhler.

*Lygus plagiatus* Uhler, Hemip. Colo., 35, 1895.  
Cornell Univ. Agr. Expt. Sta., Bull. 391, 576, 1917.

*Male*: Length 5.3 mm., width 2.8 mm.; more robust than *pratensis*, black with greenish yellow, mottled; head and anterior part of pronotum yellowish or olive green, hemelytra irregularly mottled with black and paler spots; differs from *pratensis* in the antennal segments and in the form of the right genital clasper.

*Female*: Slightly more robust than the male and usually paler in color; second antennal segment shorter; pronotum more yellowish, black rays behind the calli frequently not reaching the black basal margin; venter greenish yellow, blackish on the vagina exterior, dark specimens with the black more extended.

Breeds on great ragweed (*Ambrosia trifida*).

Massachusetts, Rhode Island, Long Island, N. Y.

**L. apicalis** Fieber.

*Lygus apicalis* Fieber, Eur. Hemip., 275, 1861.  
Cornell Univ. Agr. Expt. Sta., Bull. 391, 601, 1917.

*Male*: Length 4.5-5 mm., width 2 mm.; oblong; width of head 1.12 mm., vertex .29 mm.; greenish, dark green, or yellowish green, the membrane, and in some cases the corium, marked with fuscous; head broad, the eyes unusually large in the male; genital claspers very distinctive of the species (fig. 103).



FIG. 103. *Lygus apicalis* Fieber, —male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 104. *Lygus pabulinus* Linnaeus.—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, internal lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

*Female*: Length 4.6 mm., width 2.05 mm.; width of head 1.05 mm., vertex .37 mm.; uniformly green or greenish yellow; eyes dark brown; tips of tarsi and apex of rostrum blackish.

Breeds on *Erigeron canadensis*.

Massachusetts, Maine.



**L. pabulinus** (Linnaeus).

*Cimex pabulinus* Linnaeus, Fauna Suec., Edn. 2, 253, 1761.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 595, 1917.

**Male:** Length 5.5 mm., width 2 mm.; elongate, pale green or greenish yellow, frequently fading to dull yellowish; carina of vertex obsolete in the middle; a fuscous Y-shaped mark formed at the extreme anal area of membrane, and usually a spot within the apices of areoles and a distinct longitudinal cloud extending beyond to tip of membrane.

**Female:** Length 6.1 mm., width 2.22 mm.; slightly larger and more robust than the male but not differing in coloration.

Breeds on *Impatiens biflora*.

Bridgeport, 20 Sept. (B. H. W.); Cheshire, 8 July, 1904 (H. L. V.); Darien, 10 June, 1912 (C. W. J.); Middletown, 17 June, 1909 (C. W. J.); New Haven, 10 June, 1910, 22 and 25 July, 3 Oct. (B. H. W.); Stratford, 28 Aug., 1905 (W. E. B.).

**L. fasciatus** Reuter.

Ofv. Kongl. Sv. Vet.-Akad., Forh., xxxvi, No. 2, 72, 1876.

**Male:** Length 4 mm., width 1.7 mm.; small ovate, greenish and marked with reddish and brown; eyes large, width of head 1.03 mm., vertex .27 mm.; width of pronotum at base 1.5 mm., length of antennal segment ii 1.33 mm.; scutellum except median line or apex dark reddish, red sometimes composed of spots; inner half of clavus and inner apical angles of corium, brownish black; apical half of hind femora broadly red, the apex and a ring just



FIG. 105. *Lygus fasciatus* Reuter,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

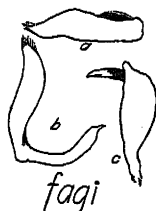


FIG. 106. *Lygus fagi* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

before pale, tibiae annulated at base with dark reddish, or at least reddish on inside at base; anal area of membrane distinctly infuscated; genital claspers distinctive (fig. 105).

**Female:** More robust than the male but very similar in coloration.

Breeds on *Cephalanthus occidentalis*, also collected on *Baccharis halimifolia*, *Myrica cerifera*, and attracted to flowers of *Hemerocallis fulva*.

Branford, 27 June, 1904 (H. L. V.); East River, 2 Aug., 7 Sept., 1910 (C. R. Ely).

***L. fasciatus* var. *viridiusculus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 600, 1917.

*Female*: Length 4.6 mm., width 2.05 mm.; structurally differing very slightly, if at all, from the typical form; bright green, slightly larger than and lacking the brownish and fuscous coloring of *fasciatus*; clavus only slightly tinged with fuscous at tip of scutellum, a touch of fuscous at inner apical angles of corium; anal area of membrane not distinctly infuscated; hind femora with two red marks on upper sides near apices, tibiae reddish on inside at base.

Massachusetts.

Subgenus **NEOLYGUS** Knight.

*Key to Species.*

1. Pronotal disk blackish or marked with dark rays ..... 21  
Pronotal disk greenish, or yellowish to brownish, but without distinct dark rays ..... 2
2. Color chiefly greenish, old specimens frequently fading to yellowish; sometimes darkened on clavus and at tip of corium but ground color green ..... 3  
Color distinctly yellowish or brownish, more brownish than green 10
3. Tibial spines with fuscous spots at base ..... 4  
Tibial spines without fuscous spots at base ..... 5
4. Corium with fuscous spot on inner apical angle; clavus greenish yellow, more brownish near scutellum and suture .. (p. 584) *confusus*  
Corium never infuscated but with dilute bronze on inner half; clavus and basal half of pronotum distinctly bronzed ... (p. 584) *alni*
5. Dorsum uniformly greenish, a small fuscous mark formed at extreme inner apical angles of corium and transversely across anal area of membrane; length 5.2-5.7 mm. .... (p. 590) *neglectus*  
Dorsum with brownish, apical area of corium and usually the clavus distinctly brownish, sometimes dark brownish or even fuscous, but more broadly so than the above ..... 6
6. Membrane with apical half infuscated along median line, forming a distinct longitudinal ray which may be widened apically; corium with a triangular dark brownish spot just before apex, clavus usually brownish; length 5.6-6 mm. .... (p. 593) *belfragii*  
Membrane never forming median longitudinal fuscous ray; smaller forms ..... 7
7. Antennal segment ii not distinctly infuscated ..... 8  
Antennal segment ii infuscated on apical one-fifth (p. 595) *canadensis*
8. Scutellum pale, clavus and apex of corium usually darkened .... 9  
Scutellum darkened with fuscous, also the clavus more or less, corium with a triangular dark patch before apex .....  
(p. 587) (female) *tiliae*
9. Clavus dark brown bordering scutellum only; apical half of membrane clear, a fuscous spot at margin each side of middle, a spot also bordering tip of cuneus ..... (p. 587) *inconspicuus*  
Clavus dark brown or fuscous bordering commissure as well as along the scutellum; apical half of membrane rather uniformly infuscated ..... (p. 593) *clavigenitalis*

10. (2) Rostrum extending beyond apices of intermediate coxae .... 12  
Rostrum scarcely attaining apices of intermediate coxae; color rich yellowish brown, darker on clavus and apically on corium ... 11
11. Antennal segment ii infuscated at apex, length exceeding width of pronotum at base ..... (p. 585) *viburni*  
Antennal segment ii not infuscated, length not equaling width of pronotum at base ..... (p. 596) *nyssae*
12. Tylus with apical half black; two bands near apices of hind femora, sides of body, and more or less on head, reddish ..... (p. 584) *atritylus*  
Tylus not black, or if so, then the body and bands on femora not reddish ..... 13
13. Hind femora distinctly biannulated near apices with darker or with paler; antennal segment ii infuscated apically ..... 19  
Hind femora not distinctly biannulate before apices, when dark, paler only at extreme tip; antennal segment ii rarely infuscated, but if so, annuli on femora are indistinct ..... 14
14. Scutellum infuscated, a pale median vitta on apical half; dorsum dark greenish brown to blackish, a lateral dark fuscous stripe extending full length of body; femora dark but pale at extreme tips ..... (p. 583) *invitus*  
Scutellum sometimes dark but without indication of a pale median line ..... 15
15. Hemelytra uniformly ferrugino-testaceous, rich brownish, or fulvo-aeneous, not appreciably darker on clavus and apical half of hemelytra ..... 16  
Hemelytra not uniformly colored, clavus and apical half of corium darker than scutellum and basal half of corium ..... 17
16. Hemelytra and femora fulvo-aeneous; membrane distinctly infuscated ..... (p. 583) *fagi*  
Hemelytra (male) ferrugino-testaceous to blackish, or (female) uniformly rich brownish; membrane (male) infuscated, or (female) uniformly yellowish ..... (p. 594) *hirticulus*
17. Antennal segment ii uniformly colored, never distinctly infuscated apically ..... 18  
Antennal segment ii infuscated; clavus and apical half of corium dark brownish, embolium, outer basal half of corium, and cuneus, pale translucent; length 5.5-6 mm. .... (p. 595) *ostryae*
18. Antennal segment ii scarcely exceeding width of pronotum at base; rostrum scarcely attaining apices of hind coxae; hemelytra greenish yellow, apical spot on corium, and inner margins of clavus, dark brownish to blackish ..... (p. 593) *clavigenitalis*  
Antennal segment ii much exceeding width of pronotum at base; rostrum extending slightly beyond apices of hind coxae; clavus and corium dark brownish ..... (p. 585) *genesensis*
19. (13) Color yellowish to brownish, apical half of corium brownish but not forming a delimited spot; femora distinctly brownish or reddish ..... 20  
Pale greenish yellow, clavus and large spot on apical half of corium dark brownish black; femora greenish yellow, banded before apices with pale fuscous ..... (p. 595) *canadensis*
20. Femora and usually the sides of body distinctly reddish; hind femora annulated before apices with dark reddish (p. 591) *quercalbae*  
Femora and sides of body dark brown to fuscous; hind femora annulated before apex with dark fuscous ..... (p. 592) *omnivagus*
21. (1) Pronotal disk with distinct dark rays or spots behind calli .. 25  
Pronotal disk blackish but without distinct rays ..... 22
22. Sides of body and hind femora distinctly reddish, the latter annulated near apices with pale and fusco-reddish ... (p. 591) *quercalbae*  
Sides of body and femora not distinctly reddish ..... 23

23. Hind femora greenish to brownish, without subapical annuli ..... 24  
Hind femora blackish, annulated with paler near apices; hemelytra blackish, costal margin scarcely paler, cuneus clear, the apex fuscous ..... (p. 588) *caryae*
24. Embolium greenish, clavus and inner half of corium dark fuscous to blackish ..... (p. 587) (male) *tiliae*  
Embolium scarcely paler, hemelytra and whole dorsum nearly uniform dark brownish black ..... (p. 594) (male) *hirticulus*
25. (21) Hind femora biannulate near apices with brownish black or pale ..... 26  
Hind femora dark brownish to black on apical half but not distinctly biannulate, distinctly pale on apex only ..... 32
26. Antennal segments i and ii black; embolium, outer half of corium, and cuneus, pale translucent ..... (p. 593) *johnsoni*  
Antennal segment i pale or only slightly brownish; embolium apically and outer half of corium darkened, but if not, then antennal segment i distinctly pale ..... 27
27. Sides of body and usually hind femora distinctly reddish .....  
Sides of body and femora not distinctly reddish ..... (p. 590) *communis* 28
28. Embolium infuscated apically, or if not, then the calli and just before with blackish ..... 29  
Embolium and basal half of corium pale, a large blackish spot on apical half of corium; clavus and a nearly quadrate spot behind each callus blackish; calli and just before without blackish .....  
*canadensis* var. *binotatus*
29. Antennal segment ii distinctly infuscated, at least apically ..... 30  
Antennal segments i and ii yellowish; clavus, apical half of corium and embolium blackish ..... (p. 586) *parrotti*
30. Calli blackish before as well as behind, a small fuscous spot or ray on median line just before or extending between calli ..... 31  
Calli and a widening ray behind each callus blackish, in darkest specimens the whole disk blackish but a distinct pale ray remains between the calli; head and legs usually slightly tinged with reddish; in darkest specimens the scutellum and basal half of corium remain paler ..... (p. 586) *parshleyi*
31. Scutellum except median line apically, and hemelytra except cuneus, dark fuscous to blackish ..... (p. 588) *caryae*  
Scutellum and basal half of corium and embolium distinctly paler  
*caryae* var. *subfuscus*
32. (25) Scutellum with median line infuscated; apex and inner margin of cuneus, femora and more or less on sides of body, reddish ..... (p. 591) *univittatus*  
Scutellum never forming fuscous vitta on median line ..... 33
33. Pronotal disk with small fuscous mark behind each callus; venter fuscous brown, a lateral pale stripe dividing the dark color .....  
(p. 592) *semivittatus*
- Pronotal disk with distinct black ray or spot behind each callus; sides of venter without pale stripe ..... 34
34. Pronotal disk with black rays behind calli but not attaining basal margin ..... 35  
Pronotal disk with black stripe traversing outer half of callus and extending to basal margin; pale yellowish, clavus and extremity of corium and embolium black ..... (p. 589) *vitticollis*
35. Pronotal disk with two conspicuous black spots, one behind each callus and forming nearly square spots; ground color yellowish brown; hind femora blackish except extreme tips (p. 589) *atrinotatus*  
Pronotal disk with a conspicuous black ray behind each callus, slender but becoming broader distally; ground color yellowish brown with fuscous, distinctly tinged with pink; hind femora reddish brown, indistinctly annulated with paler at apices .....  
(p. 597) *laureae*

**L. (*Neolygus*) *fagi* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 603, 1917.

*Male*: Length 4.8 mm., width 1.94 mm.; not darker than the female and both sexes look much like the female of *hirticulus*; differs from *hirticulus* by being more fulvo-aeneous in coloration and by the dark fuscous membrane; genital claspers distinctive of the species (fig. 106).

*Female*: Slightly larger and more robust than the male; very similar to the female of *hirticulus*, but usually distinguishable by the infuscated membrane and in general by the more fulvo-aeneous coloration.

Breeds on *Fagus grandifolia* and perhaps *Betula lutea*.

Massachusetts, New Hampshire, New York, Vermont.

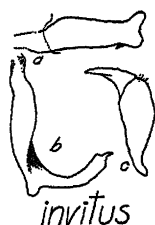


FIG. 107. *Lygus invitus* Say,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 108. *Lygus atritylus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**L. (*Neolygus*) *invitus* (Say).**

*Capsus invitus* Say, Heter. N. Harm., 24, 1832; Compl. Writ., i, 345, 1859.

Cornell Univ. Agr. Expt. Sta., Bull. 391, pl. 604, 1917.

*Male*: Length 5 mm., width 2 mm.; dark greenish with fuscous or blackish, sides of the body with a dark fuscous stripe extending the full length of the body, including the whole genital segment; scutellum with a pale median vitta on apical half; disk of pronotum dark brownish or blackish but never with two distinct rays as in *communis*; genital claspers distinctive of the species (fig. 107).

*Female*: Length 5.1 mm., width 2.2 mm.; slightly more robust than the male, very similar in coloration but in general lighter-colored, the pale vitta on scutellum more extended.

Breeds on *Ulmus americana*.

Danbury, 15 June, 1909 (C. W. J.); New Haven, 25 June, 1920 (B. H. W.); South Meriden, 15 June (H. L. J.); Winnipauk, 16 June, 1909 (C. W. J.).

**L. (*Neolygus*) *atritylus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 606, 1917.

*Male*: Length 5.2 mm., width 2.2 mm.; closely related to *invitus* and *fagi*, the darker forms much resembling a pale or yellowish form of *invitus*; greenish yellow to pale brownish, corium slightly darkened apically with fuscous, cuneus uniformly pale translucent; hind femora with two subapical bands, sides of body, and more or less on head, reddish; easily distinguished by the black tylus and genital claspers (fig. 108).

*Female*: Length 5.4 mm., width 2.36 mm.; very similar to the male in coloration except that the corium is rarely, if ever, darkened with fuscous.

Breeds on *Salix*.

Allotype: Male, 13 July, 1920, Cranberry Lake, N. Y. (C. J. Drake), taken on *Salix*; author's collection.

New Hampshire, New York, Vermont.

**L. (*Neolygus*) *confusus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 606, 1917.

*Male*: Length 5.3 mm., width 2.05 mm.; green, differs from *alni* in lacking the strong bronze colors, in having a fuscous spot at tip of corium, and in different membrane markings; fuscous spots at base of tibial spines more distinct than in *alni*, and in addi-



FIG. 109. *Lygus confusus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

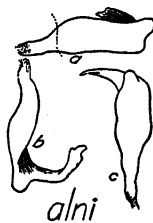


FIG. 110. *Lygus alni* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

tion there are small fuscous spots on lower side of posterior femora; genital claspers distinctive of the species (fig. 109).

*Female*: Length 4.3 mm., width 2.2 mm.; very similar to the male but more robust, coloration slightly paler.

Allotype: Female, 30 July, 1919, Peaks Island, Me. (G. A. Moore); author's collection.

Maine, New Hampshire, New York.

**L. (*Neolygus*) *alni* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 607, 1917.

*Male*: Length 5.7 mm., width 2 mm.; closely related to *viridis* Fallen, but differs in the male genital claspers, in having the scutellum distinctly darker, and in that the apical part of antennal segment ii is not infuscated; more slender than *viridis*, bright green, bronze on clavus and basally on disk of pronotum, with a more dilute bronze on scutellum and on inner half of corium; tibial spines infuscated at base; genital claspers distinctive (fig. 110).

*Female*: Not differing from the male in coloration but slightly more robust.

Breeds on *Alnus incana*.

New Hampshire, New York.

**L. (*Neolygus*) *genesensis* Knight.**

Cornell Univ. Agr. Exp. Sta., Bull. 391, 609, 1917.

*Male*: Length 5 mm., width 2.05 mm.; yellowish brown to dark brown and fuscous; allied to *viburni*, having much the same color



FIG. 111. *Lygus genesensis* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 112. *Lygus viburni* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

but differing by the slightly smaller size, in the longer rostrum, and in the structure of the genital claspers (fig. 111).

*Female*: Length 4.9 mm., width 2.1 mm.; very similar to the male but more uniformly yellowish brown; distinguished from *viburni* by the uniformly yellowish color of the antennae, and by the length of the rostrum which extends to posterior margins of hind coxae.

Breeds on *Quercus alba*.

Massachusetts, Long Island, N. Y.

**\*L. (*Neolygus*) *viburni* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 609, 1917.

*Male*: Length 5.2 mm., width 2.08 mm.; width of head 1.03 mm., vertex .38 mm.; smaller than *omnivagus*, and more yellowish

brown; closely related to *geneseensis*, but differs in the male claspers, in being more robust, in having a shorter rostrum, in that apical half of antennal segment ii is infuscated, and having in general a richer yellowish brown color.

*Female*: Length 5.3 mm., width 2.28 mm.; width of head 1.03 mm., vertex .45 mm.; very similar to the male in coloration but usually not so dark; distinguished from *geneseensis* by the shortness of rostrum, which scarcely attains posterior margins of intermediate coxae, and by the second antennal segment which is darkened on apical half.

Breeds on *Viburnum lentago*.

New Haven, 11 June, 1914 (B. H. W.).

**L. (*Neolygus*) *parrotti* Knight.**

Bull. Brook. Ent. Soc., xiv, 21, 1919.

*Male*: Length 5.1 mm., width 1.9 mm.; closely related to *viburni* but distinguished by the longer rostrum, fuscous rays on disk of pronotum, antennal segments i and ii yellowish, clavus and apical half of corium fuscous; resembles *parshleyi* but differs in the right genital clasper and in the entirely yellowish segments i and ii of the antennae.

*Female*: Very similar to the male in size and coloration.

Breeds on *Viburnum sterilis* and *Viburnum opulus*.

New York.

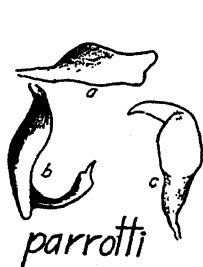


FIG. 113. *Lygus parrotti* Knight, —male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged.—Drawing by Dr. H. H. Knight.



FIG. 114. *Lygus parshleyi* Knight, —male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**L. (*Neolygus*) *parshleyi* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 611, 1917.

*Male*: Length 4.8 mm., width 2 mm.; closely related to *atrino-tatus* but differs materially in the genital claspers (fig. 114), in not having the blackish rays on pronotum clearly defined as spots, and in general by the more brownish coloration.



*Female*: Length 5 mm., width 2.1 mm.; the dark colors much reduced, otherwise similar to the male in coloration.

Food plant unknown.

Maine, New Hampshire.

\**L. (Neolygus) inconspicuus* Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 612, 1917.

*Male*: Length 4.5 mm., width 2.08 mm.; pale greenish, a transverse spot of brownish at apex of corium and dark brownish on clavus bordering scutellum; in general appearance resembling most the female of *tiliae* and both sexes of *clavigenitalis*, but differing greatly from those species in form of genital claspers (fig. 115).

*Female*: Length 4.8 mm., width 2.25 mm.; very similar to the male in size and coloration; similar in size and general appearance to females of *clavigenitalis* and *tiliae*; distinguished from *tiliae* by the pale scutellum, and from *clavigenitalis* by the more greenish color and paler scutellum.

Breeds on *Vitis rotundifolia*.

New Haven, 23 June (B. H. W.).

\**L. (Neolygus) tiliae* Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 613, 1917.

*Male*: Length 4.6 mm., width 1.74 mm.; rather small, scarcely as large as *invitus*; greenish yellow with the base of pronotum darker, the scutellum, clavus, and corium dark fuscous to blackish; genital claspers distinctive (fig. 116).



FIG. 115. *Lygus inconspicuus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 116. *Lygus tiliae* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

*Female*: Length 5 mm., width 2 mm.; lighter colored than the male and usually slightly larger; pronotum yellowish, scutellum and clavus only slightly darkened, apex of corium with a triangular dark patch, much resembling *belfragii* in this respect; similar in

size and general appearance to females of *inconspicuus* and *clavigenitalis*; distinguished from *inconspicuus* by having a more conical shape to front of head, and in the darker-colored scutellum; *clavigenitalis* differs in having more brownish and in the paler scutellum.

Breeds on *Tilia americana*.

Danielson, 21 June, 1920 (J. T. Ashworth); Middletown, 17 June, 1909 (C. W. J.); Poquonock, 27 June, 1905 (H. L. V.).

\**L. (Neolygus) caryae* Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 615, 1917.

*Male*: Length 5.4 mm. (variation 4.8-5.7 mm.), width 2.1 mm.; dark brownish to black, cuneus pale and thus superficially resembling *Neoborus geminus* (Say); the paler brown forms suggest *Lygus omnivagus*; genital claspers distinctive (fig. 117).

*Female*: Length 5.5 mm. (variation 5-6.3 mm.), width 2.3 mm.; more robust than the male, frequently with brownish yellow between the calli and extending back over the disk.

Breeds on hickory (*Carya*).

Branford, 8 June, 16 June (B. H. W.); New Haven, 21 June, 24 June, 1905 (B. H. W.); Portland, 5 June, 1914 (B. H. W.); Yalesville, 27 June, 1907 (B. H. W.).

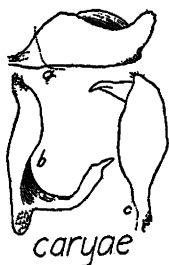


FIG. 117. *Lygus caryae* Knight, —male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 118. *Lygus atrinotatus* Knight, —male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

\**L. (Neolygus) caryae* var. *subfuscus* Knight.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 616, 1917.

A yellowish brown color form which differs greatly in general aspect from the typical *caryae*, very much resembling *omnivagus* in coloration. Antennal segment ii brownish with fuscous, basal one-third and frequently one-half, yellowish brown as segment i. Yellowish brown, pronotum with two black spots, one behind each eye and frequently extending back over the calli thus forming two

black rays; scutellum pale yellowish, frequently fuscous at base, in darker specimens a fuscous median line extending from base toward apex. Hemelytra in color very much resembling those of *omnivagus*, but the two black rays on pronotum, and the dark color of the scutellum appearing along the median line, distinguish this variety at once from that species.

Branford, 8 June, 13 June (B. H. W.); Portland, 5 June, 1914 (B. H. W.); South Meriden, 7 June (H. L. J.).

**L. (*Neolygus*) *atrinotatus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 617, 1917.

*Male*: Length 4.7 mm., width 2.08 mm.; resembles *canadensis* var. *binotatus* and certain color forms of *parshleyi*, but differs greatly in the genital claspers (fig. 118); yellowish brown, antennal segment ii and two conspicuous spots on pronotum black; clavus, apical half of corium, and narrow lateral margins of scutellum, blackish; a blackish stripe on the sides extending for full length of body.

*Female*: Length 5.5 mm., width 2.3 mm.; slightly larger and more robust than the male but very similar in coloration.

District of Columbia, North Carolina, Pennsylvania.



FIG. 119. *Lygus vitticollis* Reuter,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 120. *Lygus neglectus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**L. (*Neolygus*) *vitticollis* Reuter.**

*Lygus vitticollis* Reuter, Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxii, No. 9, 71, 1876.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 618, 1917.

*Male*: Length 5.8 mm., width 2.48 mm.; elongate, easily distinguished by its large size and black markings; pale yellowish, two rays on pronotum, clavus, apical half of posterior femora, apices of corium and embolium, black; rostrum reaching only upon intermediate coxae; genital claspers (fig. 119) distinctive.

*Female*: More robust than the male but not differing in coloration.

Breeds on *Acer saccharum* and *Acer rubrum*.

Branford, 8 June (B. H. W.); Cornwall, 23 June (K. F. C.); Danbury, 15 June, 1909 (C. W. J.); Eastford, 12 June (B. H. W.); East River, Aug., 1910 (C. R. E.); Litchfield, 20 June, 1908 (L. B. W.); New Haven, 9 June, 1905, 16 June, 1921 (B. H. W.).

**L. (*Neolygus*) *neglectus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 619, 1917.

*Male*: Length 5.2 mm., width 2.3 mm.; bright green, robust, shorter and broader than *pabulinus*; easily distinguished from that species by the presence of a distinct carina on base of vertex; head, calli, and ventral side of body, becoming yellowish; a small fuscous cloud on anal area of membrane and inner angles of cuneus; genital claspers (fig. 120) distinctive.

*Female*: Length 5.6 mm., width 2.4 mm.; very similar to the male but more robust in form.

Breeds on *Carpinus caroliniana*.

Massachusetts.

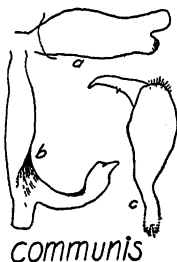


FIG. 121. *Lygus communis* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

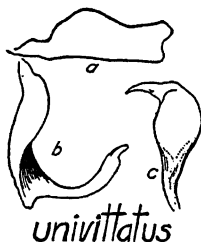


FIG. 122. *Lygus univittatus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**L. (*Neolygus*) *communis* Knight.**

Can. Ent., xlviii, 346, 1916.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 620, 1917.

*Male*: Length 5.5 mm., width 2.3 mm.; greenish and darkened with brownish and fuscous; suggestive of *invitus* but easily distinguished by the two black rays on disk of pronotum, by the reddish color in lateral stripe of the body, and by the larger size; differs structurally by absence of longitudinal line on vertex and in the form of the genital claspers (fig. 121).

*Female*: More robust than the male, scarcely differing in coloration although usually slightly paler.

Breeds on *Cornus stolonifera*, *C. paniculata*, and the cultivated pear. Commonly known as the "false tarnished plant bug," and is a destructive pest on pears in New York and on apples in Nova Scotia.

Middletown, 17 June, 1909 (C. W. J.); South Meriden, June, 1915 (H. L. J.).

**L. (*Neolygus*) *univittatus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 623, 1917.

*Male*: Length 5.3 mm., width 2.2 mm.; resembling *laureae* in coloration, but smaller than that species; similar in size to large forms of *quercalbae* but darker colored and with reddish; distinguished by having a median longitudinal fuscous vitta on the scutellum; antennal segment i black, two blackish rays on disk of pronotum behind the calli, apex of cuneus reddish; genital claspers distinctive (fig. 122).

*Female*: Length 5.4 mm., width 2.4 mm.; more robust than the male but very similar in coloration.

Breeds on *Crataegus*.

New York.



FIG. 123. *Lygus quercalbae* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 124. *Lygus semivittatus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**L. (*Neolygus*) *quercalbae* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 624, 1917.

*Male*: Length 5.7 mm., width 2.4 mm.; resembles *omnivagus* but is more reddish brown in color, differs in being more robust and in having a pale stripe through the fuscous on sides of venter; similar to *semivittatus* in coloration of the venter, but differs in not having distinct fuscous spots behind the calli and in general by the more reddish color; genital claspers (fig. 123) distinctive.

*Female*: Length 5.6 mm., width 2.6 mm.; more robust than the male, but very similar in coloration; larger and more reddish than *omnivagus* and *semivittatus*; distinguished by pale stripe on sides of venter and by absence of fuscous spots behind the calli, also by the distinctly reddish color on hind femora and sides of body.

Breeds on *Quercus alba*.

New Haven, 7 July, 1920 (B. H. W.); Orange, 22 June, 1920 (B. H. W.).

**L. (*Neolygus*) *semivittatus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 626, 1917.

*Male*: Length 5.3 mm., width 2.28 mm.; resembles *omnivagus* in coloration of the hemelytra; two small fuscous marks on disk behind calli; very suggestive of *caryae* var. *subfuscus* but differs by having a pale stripe through the fuscous on sides of venter; similar to *quercalbae* in having the venter fuscous brown and with pale stripe dividing the dark color, but distinguished at once by the fuscous marks on pronotum; genital claspers distinctive (fig. 124).

*Female*: Length 5.4 mm., width 2.2 mm.; very similar to the male in coloration but with less fuscous on the hemelytra; most easily confused with *caryae* var. *subfuscus* but distinguished by the longitudinal pale stripe running through the fuscous color on sides of venter.

Breeds on *Quercus alba*.

Long Island, N. Y.

**\*L. (*Neolygus*) *omnivagus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 627, 1917.

*Male*: Length 5.4 mm., width 2.2 mm.; yellowish brown, corium dark brownish to fuscous apically, clavus dark brownish or blackish; very much resembling forms of *semivittatus* and *quercalbae*, also might be confused by coloration with *caryae* var. *subfuscus*; genital claspers distinctive (fig. 125).

*Female*: Length 5.4 mm., width 2.5 mm.; usually paler than the male, more yellowish brown; never with reddish as in *quercalbae*, nor with fuscous marks on the pronotum as in *semivittatus* or in *caryae* 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 the apex of the corium smaller and not invading the pale embolium.

Breeds on *Quercus alba*, *Q. rubra*, *Q. coccinea*, and probably other oaks; breeds occasionally on *Cornus*, *Castanea*, and *Viburnum*.

Branford, 28 July, 1905 (H. L. V.); Danbury, 15 June, 1909 (C. W. J.); Darien, 10 June, 1912 (C. W. J.); Double Beach, 5 June (H. L. V.); Litchfield, 8 Aug., 1912 (L. B. W.); Middletown, 17 June, 1909 (C. W. J.); New Haven, 8 June, 1904, 4 July, 1920 (B. H. W.).

**\*L. (Neolygus) johnsoni Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 629, 1917.

*Male*: Length 5.7 mm., width 2.3 mm.; resembles *communis* in having two prominent black spots on pronotum, but is distinguished at once by the clear outer margin of hemelytra and the dark fuscous inner half of corium; the long, thick, upturned prong of the left genital clasper is distinctive of the species (fig. 126).

*Female*: Slightly more robust than the male but similar in coloration.

Breeds on *Carpinus caroliniana*.

Hamden, 20 June, 1920 (B. H. W.); Middletown, 17 June, 1909 (C. W. J.), type locality.

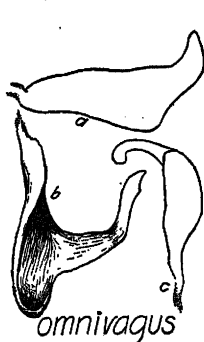


FIG. 125. *Lygus omnivagus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 126. *Lygus johnsoni* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

**L. (Neolygus) belfragii Reuter.**

Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxii, No. 9, 71, 1876.

Cornell Univ. Agr. Expt. Sta., Bull. 391, 630, 1917.

*Male*: Length 5.8 mm., width 2.28 mm.; elongate, green or greenish yellow, clavus brownish and tinged with fuscous and bronze, apex of corium with a triangular fuscous or blackish patch, membrane fuscous longitudinally through the middle; general aspect resembling *confusus*, *almi*, and females of *tiliae*; genital claspers distinctive (fig. 127).

*Female*: Length 5.5-5.8 mm.; similar to the male in coloration but in form more robust.

Breeds on *Acer spicatum* and *Viburnum acerifolium*.

Branford, 13 June, 1920 (B. H. W.); New Haven, 28 June, 1920 (B. H. W.).

**L. (Neolygus) clavigenitalis Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 632, 1917.

*Male*: Length 4.8 mm., width 2.17 mm.; yellowish brown, with darker brown on the clavus and apex of corium; resembling most the female of *tiliae*, and both sexes of *inconspicuus*; differs from those species by lacking the green, in having the pronotum evenly shaded with yellowish brown, and in being more brownish than fuscous on the hemelytra; genital claspers very distinctive of the species (fig. 128).

*Female*: Length 5.1 mm., width 2.3 mm.; slightly larger and more robust than the male but very similar in coloration; most likely to be confused with the females of *tiliae* and *inconspicuus*, also resembling the pale forms of *viburni* and *genesceusis*. Points of difference are: *inconspicuus* is more greenish and the fuscous marks on clavus and apex of corium are more in contrast; *tiliae* is more green, particularly the pronotum, and the scutellum is darkened with fuscous; *viburni* has nearly the whole corium brownish, apex of embolium darkened, and the apical half of antennae fuscous; *genesceusis* is very similar to *viburni* except that the antennae are not fuscous, but the embolium is darkened to even a greater extent.

Litchfield, 22 July, 1920 (P. G.).

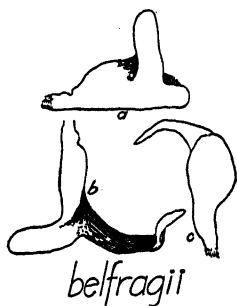


FIG. 127. *Lygus belfragii* Reuter,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

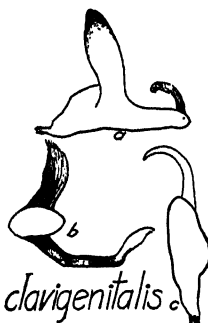


FIG. 128. *Lygus clavigenitalis* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

### L. (*Neolygus*) *hirticulus* Van Duzee.

*Lygus tenellus* Van Duzee, Buff. Soc. Nat. Sci., Bull. x, 484, 1912.  
Cornell Univ. Agr. Expt. Sta., Bull. 391, 633, 1917.

*Male*: Length 4.8 mm., width 2.28 mm.; dark ferrugino-testaceous, sometimes entirely dark fuscous or blackish excepting the legs and antennae; genital claspers distinctive (fig. 129).



*Female*: Length 5.3 mm., width 2.3 mm.; slightly larger and more robust than the male; uniformly colored with yellowish brown or in some cases dark brown, hemelytra rarely much darker than pronotum; could easily be confused with *fagi*, but may be distinguished by the membrane which is uniformly and faintly tinged with fuliginous and is never dark as in *fagi*.



FIG. 129. *Lygus hirticulus* Van Duzee,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 130. *Lygus canadensis* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

Breeds sparingly on several plants; reared from chestnut, beech, and woodbine.

New Haven, 25 June, 1920 (B. H. W.).

**L. (*Neolygus*) *canadensis* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 634, 1917.

*Male*: Length 5.5 mm., width 2.08 mm.; resembles *omnivagus* in general appearance; yellowish brown, clavus and apex of corium dark brownish, margins of the scutellum sometimes brownish; genital claspers distinctive (fig. 130).

*Female*: Slightly more robust than the male, usually with less dark brown on the hemelytra.

New Jersey, New York.

**L. (*Neolygus*) *canadensis* var. *binotatus* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 635, 1917.

Male genital claspers similar to those of *canadensis*, but differs at least in having a very distinct ray behind each callus which extends to near basal margin of the disk; scutellum appears more convex and with dark brownish at the sides.

New Jersey, New York.

**L. (*Neolygus*) *ostryae* Knight.**

Cornell Univ. Agr. Expt. Sta., Bull. 391, 635, 1917.

*Male*: Length 5.8 mm., width 2.36 mm.; resembles pale and yellowish specimens of *belfragii*, usually slightly larger and more strongly yellowish brown in color; embolium and basal half of corium pale yellowish, clavus and apical half of corium brownish to dark brown, cuneus clear tinged with yellow; readily distinguished by the two unusually large upturned prongs of the left genital clasper (fig. 131).

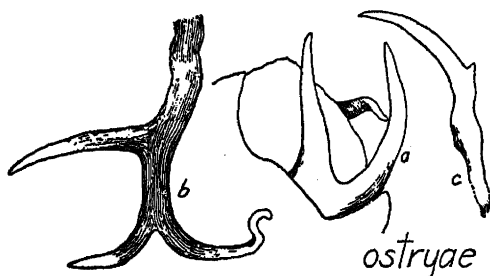


FIG. 131. *Lygus ostryae* Knight,—male genital claspers, (a) genital segment, left lateral aspect, (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

*Female*: Length 6 mm., width 2.4 mm.; similar to the male in coloration but in form slightly larger and more robust.

Breeds on *Ostrya virginiana*.

Massachusetts, New York, Vermont.

**L. (Neolygus) nyssae** Knight.

Bull. Brook. Ent. Soc., xiii, 43, 1918.

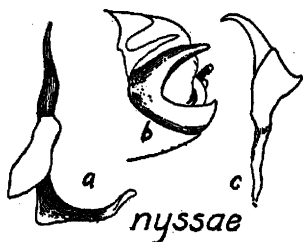


FIG. 132. *Lygus nyssae* Knight,—male genital claspers, (a) left clasper, dorsal aspect, (b) lateral aspect of left clasper and tip of venter, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.



FIG. 133. *Lygus laureae* Knight, male genital claspers, (a) genital segment, left lateral aspect, (not to scale), (b) left clasper, dorsal aspect, (c) right clasper, ventral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

*Male*: Length 5.5 mm., width 2.5 mm.; slightly more robust but in general structure similar to *quercalbae*; pronotum and scutellum evenly shaded with rich brown, clavus and corium darker brown; genital claspers distinctive of the species (fig. 132), most closely related to *laureae*.

*Female*: Length 5.6 mm., width 2.57 mm.; very similar to the male in size and coloration.

Breeds on sour gum (*Nyssa* sp.).

Lyme, 16 June, 1919 (B. H. W.).

**L. (*Neolygus*) *laureae* Knight.**

Cornell, Univ. Agr. Expt. Sta., Bull. 391, 636, 1917.

*Male*: Length 6 mm., width 2.4 mm.; resembles *communis* but is larger; yellowish brown, tinged with pink; form of genital claspers very unusual and distinctive (fig. 133).

*Female*: Length 6.4 mm., width 2.6 mm.; similar to the male but slightly more robust, and everywhere with more reddish; sides of the thorax and venter with more reddish than fuscous.

Breeds on mountain laurel (*Kalmia latifolia*).

New York, Pennsylvania.

***Dichrooscytus* Fieber.**

***D. suspectus* Reuter.**

Acta Soc. Sci. Fenn., xxxvi, No. 2, 37, 1909.

Length 5 mm., width 2 mm.; very similar to *rufipennis* Fallen, if not identical; yellowish green, base of scutellum, hemelytra except embolium and inner angles of cuneus, deep reddish; membrane lightly infumed, veins reddish.

Breeds on *Pinus resinosa* and *P. sylvestris*.

Stonington, 15 July, 1914 (I. W. Davis).

***D. elegans* Uhler.**

Proc. U. S. Nat. Mus., xxvii, 356, 1904.

Length 3.5 mm., width 1.5 mm.; bright green below, greenish above but tinged with reddish on hemelytra; in color quite resembling a small form of *suspectus*.

Food plants: Red cedar (*Juniperus virginiana*) and white cedar (*Thuja occidentalis*).

New York.

***D. viridicans* Knight.**

Bull. Brook. Ent. Soc., xiii, 114, 1918.

*Male*: Length 3.2 mm., width 1.25 mm.; very similar in structure to *elegans*, but bright green in color, the pubescence on pronotum blackish and more conspicuous; head, coxae, and femora, often becoming pale to brownish; pronotum and scutellum sometimes more yellowish green than bright green; cuneus green, margins on the apical half reddish; membrane fuscous, cell veins sometimes reddish.

*Female*: Length 3.3 mm., width 1.4 mm.; slightly more robust than the male but not differing in coloration.

Breeds on red cedar (*Juniperus virginiana*); sometimes found in company with *elegans* but of numerous specimens examined no variation is evident which would indicate that we are dealing with forms of a single species.

Allotype: Male, 11 July, 1920, Taghanic, N. Y. (H. H. Knight); author's collection.

Long Island, N. Y.

### Polymerus Hahn. (*Poeciloscytus* Authors).

#### Key to Species.

1. Rostrum reaching upon hind coxae, or slightly beyond ..... 2  
    Rostrum not reaching upon hind coxae ..... 4
2. Rostrum scarcely attaining hind margins of posterior coxae ..... 3  
    Rostrum reaching slightly beyond posterior coxae; yellowish brown and darkened with fuscous, cuneus red, or rarely paler *basalis*
3. Dorsum with pale and black; apical half of femora fulvous, tibiae pale; cuneus, and scutellum except basal angles, pale .....  
    *nigropallidus* n. sp.  
    Dorsum uniformly black, or only very narrowly pale on tip of embolium and cuneus; apical half of femora reddish brown but with a subapical paler annulus; tibiae stained with reddish .....  
    *tinctipes* n. sp.
4. Rostrum reaching upon middle coxae ..... 5  
    Rostrum not reaching beyond hind margin of sternum ..... 6
5. Rostrum attaining hind margins of middle coxae; dorsum black, narrow apex of cuneus and slenderly each side of fracture, pale; tibiae uniformly black .....*proximus* n. sp.  
    Rostrum just attaining middle of intermediate coxae; dorsum black and with pale, tip of scutellum and basal angle of corium pale, cuneus with pale, red, and black .....*unifasciatus*
6. Rostrum not reaching beyond middle of sternum ..... 7  
    Rostrum nearly attaining posterior margin of sternum; legs rather uniformly fulvous but hind femora with a small group of fuscous points on anterior face at middle of apical half .....*punctipes* n. sp.
7. Tibiae fulvous or with pale ..... 8  
    Tibiae black ..... 9
8. Legs uniformly fulvous; cuneus and embolium pale or fulvous ..  
    *fulvipes* n. sp.  
    Legs red, apical one-third of femora black; tibiae yellowish, apices, and more or less broadly at base, black; antennal segment ii yellowish, blackish apically .....*venustus* n. sp.
9. Rostrum reaching behind front coxae, or to near middle of sternum 10  
    Rostrum scarcely attaining hind margins of front coxae; femora red with only apices black .....*gerhardi* n. sp.
10. Cuneus red; male with coxae black, and antennal segment ii distinctly more slender than segment i; coxae yellow in female; dorsum black, somewhat shining, clothed with silvery sericeous pubescence .....*venaticus*  
    Cuneus black; male with coxae yellow as in the female, antennal segment ii equally thick as segment i; dorsum deep black, opaque, scutellum and hemelytra clothed chiefly with black pubescence ..  
    *opacus* n. sp.

**P. basalis** (Reuter).

Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxii, No. 9, 73, 1876.

Length 3.7-4.8 mm., width 1.7-2.3 mm.; pale to yellowish and darkened with fuscous and black; hemelytra yellowish translucent, clavus and apical half of corium chiefly fuscous; scutellum black, apex more or less pale; cuneus red, sometimes the embolium and legs also tinged with reddish; posterior femora with two subapical fuscous bands; clothed with silvery sericeous pubescence which appears golden yellow in certain lights.

Food plant: Dog fennel (*Anthemis*).

East River, Sept., 1910 (C. R. E.); New Haven, 24 June, 1920 (E. J. S. M.), 20 July, 1904 (W. E. B.), 12 July, 1916 (M. P. Z.); 16 June, 1920, 6 July, 1911, 28 Aug., 1910 (B. H. W.); Orange, 23 July, 1904 (P. L. B.).

**P. nigropallidus** Knight, new species.

*Male*: Length 4.3 mm., width 1.8 mm. Head: Width 1 mm., vertex .34 mm.; collum broadly exposed; black, carina, spot each side of vertex bordering eye, median line on vertex and front, lora, bucculae, and stripe each side of gula, pale; head shaped nearly as in *basalis*. Rostrum, length 1.72 mm., nearly attaining hind margins of posterior coxae, yellowish, apex blackish.

Antennae: Segment i, length .40 mm., black; ii, 1.63 mm., cylindrical, nearly equal in thickness to segment i, black, clothed with short black pubescence; iii, .74 mm., black; iv, missing.

Pronotum: Length .93 mm., width at base 1.6 mm.; obscurely transversely rugulose, moderately shining, clothed with sericeous, pale to yellowish pubescence; black, collar, anterior margins of calli and just before, between calli and a rather broad spot on median line of disk but rarely reaching basal margin, basal margin but more broadly at basal angles, pleura except near dorsal margin, pale to yellow. Scutellum pale or yellow, basal angles and the mesoscutum black; finely transversely rugulose, yellowish pubescent. Sternum yellowish to brownish; pleura yellowish, ostiolar peritreme pale.

Hemelytra: Embolar margins only very slightly arcuate; pale, inner half of clavus and slightly bordering claval suture, blackish; apical half of corium with a blackish stripe lying just within radial vein, the outer margin bordering embolium blackish except near apex; cuneus pale translucent, clothed with dark pubescence as on apical half of embolium and outer margin of corium; clavus except bordering commissure, and inner half of corium, clothed with yellowish sericeous pubescence. Membrane uniformly dark fuscous, veins and narrowly bordering apex of cuneus, pale.

Legs: Fulvous, coxae and tibiae more yellowish or testaceous, spines and pubescence black; hind femora with two or three fine fuscous points on ventral margin; apical tarsal segment and a spot on knee of posterior tibia, fuscous. Venter rather uniformly bright yellow, pale pubescent.

*Female*: Length 4.5 mm., width 2.3 mm.; very similar to the male, the pronotum somewhat more broadly pale; basal angle of cuneus reddish.

Holotype: Male, 23 June, 1907, Brown's Mills Junction, N. J.; author's collection. Allotype: same data as the type. Paratypes: Male and females (3), taken with the types. Specimens kindly presented to the writer by Dr. C. J. Drake.

*Polymerus tinctipes* Knight, new species.

*Male*: Length 3.7 mm., width 1.63 mm. Head: Width .94 mm., vertex .44 mm.; black, each side of vertex with a yellow spot bordering eye; clothed with pale sericeous pubescence. Rostrum, length 1.66 mm., attaining or slightly exceeding hind margins of posterior coxae, piceous, yellowish at joints, basal segment chiefly reddish.

Antennae: Segment i, length .33 mm., black; ii, 1.40 mm., cylindrical, more slender at base but apical half equal in thickness (.086 mm.) to segment i, black, closely set with yellowish and dusky pubescence; iii, .66 mm., blackish, somewhat thickened, tapering to more slender apically; iv, .50 mm., slender, brownish black.

Pronotum: Length .78 mm., width at base 1.40 mm.; black, obsoletely rugulose, lower pleural margin and the xyphus pale; clothed with simple pale and sericeous silvery pubescence. Scutellum black, transversely rugulose, clothed with sericeous white pubescence. Sternum and pleura black, silvery pubescent; ostiolar peritreme fuscous, posterior margin somewhat yellowish.

Hemelytra: Embolar margins moderately arcuate; obsoletely scabriculous, slightly shining; clothed with sericeous silvery pubescence; black, narrow apex of embolium and of cuneus pale. Membrane uniformly dark fusco-brownish, narrowly paler bordering apex of cuneus, veins brownish.

Legs: Coxae pale, a black spot on basal angle; femora yellowish, apical half reddish but divided by a yellowish annulus, ventral margin with an irregular row of six to eight fuscous dots, each dot formed at base of a prominent hair; tibiae reddish over a yellowish background, spines, pubescence, and spot on knee, black; tarsi fuscous. Venter black, clothed with white and dusky pubescence.

*Female*: Length 4.2 mm., width 2.1 mm.; embolar margins strongly arcuate; more robust than the male but very similar in coloration, the pale spots on vertex and tip of embolium slightly enlarged; antennal segment ii more slender than in the male, not attaining thickness of segment i.

Holotype: Male, 3 May, 1915, Great Falls, Md. (J. D. Hood); collection of W. L. McAtee. Allotype: taken with the type; author's collection. Paratypes: Males (2), taken with the types (J. D. Hood); collected "on lichen covered rock."

**P. proximus** Knight, new species.

Closely related to *nigritus* Fallen but distinguished by the uniformly dark tibiae; length of antennal segment i equal to width of vertex while in *nigritus* segment i is shorter.

*Male*: Length 5.3 mm., width 2.7 mm. Head: Width 1.13 mm., vertex .54 mm.; black, a yellowish spot each side of vertex near eye. Rostrum, length 1.8 mm., barely attaining hind margins of middle coxae, black, segment ii brownish.

Antennae: Segment i, length .60 mm., thickness .114 mm., black; ii, 2.2 mm., cylindrical, thickness .086 mm., brownish black, deep black at base, clothed with brownish pubescence; iii, .85 mm., dark brownish; iv, missing.

Pronotum: Length 1.18 mm., width at base 2.1 mm., posterior half of disk strongly convex, transversely wrinkled, uniformly deep black, slightly shining; clothed with yellowish to sericeous pubescence. Scutellum deep black, slender apex yellowish, transversely wrinkled. Sternum and pleura black, ostiolar peritreme pale to yellowish, becoming darker above.

Hemelytra: Embolar margins moderately arcuate; black, anal ridge, slender tip of embolium, and narrow base and apex of cuneus, pale; opaque, slightly shining, clothed with yellowish and black pubescence intermixed. Membrane and veins uniformly dark fuscous.

Legs: Uniformly black, in paler forms the tibiae uniformly brownish black but with no indication of annulations. Venter uniformly black, clothed with pale to yellowish pubescence.

*Female*: Length 5.3 mm., width 2.8 mm.; embolar margins more strongly arcuate than in the male, but general coloration similar. Head: Width 1.11 mm., vertex .57 mm. Antennae: Segment i, length .57 mm., thickness .10 mm.; ii, 1.7 mm., thickness .08 mm., cylindrical, more slender than in the male.

Holotype: Male, Greensburg, Pa. (Wirtner); Cornell Univ. collection. Allotype: 18 May, 1905, Columbia, Mo. (C. R. Crosby). Paratype: Male, 12 June, 1922 Faribault, Minn. (H. H. Knight).

**P. unifasciatus** Fabricius var. **lateralis** (Hahn).

*Phytocoris lateralis* Hahn, Wanz. Ins., ii, 85, fig. 169, 1834.

Reuter, Hem. Gymn. Eur., v, 55, 361, 1896.

Length male 5.6 mm., width 2.6 mm.; female, length 5.2 mm., width 2.65 mm.; clothed with golden, sericeous tomentose pubescence, and intermixed with blackish pubescent hairs; black, scutellum apically, basal angle of corium, anal ridge and invading inner angle of corium, apically on embolium and corium bordering cuneus, base and apex of cuneus, tibiae, apical one-third of front and middle femora, basal half and two subapical bands on hind femora, pale to testaceous; basal one-third of antennal segment ii, but more broadly in the female, testaceous to brownish; cuneus with inner half red, outer margin black except for pale at base and

apex; membrane fuscous, veins and central area paler, a small clear spot bordering apex of cuneus.

Breeds on *Galium boreale* in Minnesota.

Colorado, Minnesota, New York, Canada, Maine.

The typical *unifasciatus* is more broadly pale than variety *lateralis*, the embolium and corium pale except for a small fuscous patch on apical area of corium. Specimens of the typical form from North America have not been examined by the writer.

**Polymerus punctipes** Knight, new species.

Legs, embolium, and outer margins of cuneus, fulvous; hind femora with a small group of fuscous points on anterior face at middle of apical half.

*Male*: Length 4.6 mm., width 2 mm. Head: Width .97 mm., vertex .47 mm.; black, a yellow spot each side of vertex bordering eye; yellowish pubescent. Rostrum, length 1.23 mm., almost attaining hind margin of sternum, yellowish, apex blackish.

Antennae: Segment i, length .51 mm., black, narrowly yellowish at base; ii, 1.85 mm., nearly cylindrical, slightly thicker on middle, nearly equal in thickness to segment i, black, clothed with black and pale pubescence intermixed; iii, .66 mm., yellowish and tinged with dusky; iv, .80 mm., dusky.

Pronotum: Length 1 mm., width at base 1.7 mm.; black, slightly shining, disk transversely rugulose; clothed with pale and yellowish sericeous pubescence. Scutellum black, transversely rugulose, clothed with yellowish pubescence, more sericeous on basal angles. Sternum and pleura black; ostiolar peritreme yellow, becoming dusky on anterior lobe.

Hemelytra: Embolar margins slightly arcuate on apical half; black, embolium and outer margin of cuneus yellowish or fulvous; surface scabriculous, slightly shining, clothed with golden sericeous pubescence and intermixed with darker pubescent hairs. Membrane rather uniformly fusco-brownish, a small nearly clear spot bordering apex of cuneus, veins yellowish.

Legs: Fulvous, spot on knee and apical tarsal segment blackish; hind femora with a group of from two to five fuscous points on anterior face at middle of apical half, a prominent hair arising from each of the two lower points; pubescence pale to yellowish, but blackish on apical half of femora. Venter black, clothed with pale to yellowish pubescence.

*Female*: Length 5.2 mm., width 2.4 mm.; embolar margins strongly arcuate on apical half; pubescence and color similar to that of the male. Rostrum, length 1.31 mm., nearly attaining hind margin of sternum.

Holotype: Male, 4 July, 1915, Four Mile, N. Y. (H. H. Knight); author's collection. Allotype: same data as the type. Paratypes: DISTRICT OF COLUMBIA—Female, 12 June, 1906, Brightwood (O. Heidemann). FLORIDA—Female, "Jacksonville." MAINE—Male, 22 July, 1909, Machias (C. W.



Johnson). MARYLAND—Males (2) and female, 4 June, 1914, Branchville to Beltsville (W. L. McAtee). MINNESOTA—Female, 8 July, 1921, Lake City (A. A. Nichol). Female, "Minn." NEW YORK—Males (12) and females (18), taken with the types. Male, 7 July, 1917, female, 5 July, 1920, Cranberry Lake (C. J. Drake). OHIO—Male, 11 June, 1917, Sugar Grove (C. J. Drake). QUEBEC—Female, 6 July, 1918, Montreal (G. A. Moore).

The writer swept this species from scattering plants of *Lysimachia quadrifolia* which were found growing along an old clay roadway.

**\*P. fulvipes Knight, new species.**

Closely related to *punctipes* but distinguished by the shorter rostrum; cuneus, embolium, and legs, fulvous.

*Male*: Length 4.5 mm., width 2.2 mm. Head: Width .94 mm., vertex .43 mm.; black, a yellow spot each side of vertex bordering eye; yellow pubescent. Rostrum, length .97 mm., just attaining middle of sternum, yellowish, apex blackish.

Antennae: Segment i, length .48 mm., yellow, apex and pubescence black; ii, 1.71 mm., thickness .114 mm., cylindrical, equal in thickness to segment i but narrowed at base; iii, .54 mm., fuscous; iv, .68 mm., blackish.

Pronotum: Length 1.04 mm., width at base 1.73 mm.; black, nearly as in *punctipes*, pubescence golden yellow. Scutellum black, minutely transversely rugulose, clothed with sericeous golden pubescence. Sternum and pleura black, ostiolar peritreme yellow.

Hemelytra: Embolar margins slightly arcuate; black, embolium and cuneus fulvous, surface scabriculous, slightly shining, clothed with sericeous, deep golden pubescence, and intermixed apically with a few dark pubescent hairs. Membrane dark fuscous, a narrow pale spot bordering apex of cuneus, veins yellowish.

Legs: Fulvous, tarsi and tips of tibiae fuscous; hind femora usually with one small fuscous dot at base of a prominent hair, set on anterior face at middle of apical half. Venter black, yellow to golden pubescent.

*Female*: Length 5.1 mm., width 2.6 mm.; embolar margins more distinctly arcuate than in male; similar to the male in pubescence and color, but antennal segment ii slightly more slender. Rostrum, length 1.04 mm., just attaining middle of venter, fulvous, blackish at apex.

Holotype: Male, 4 July, 1915, Four Mile, N. Y. (H. H. Knight); author's collection. Allotype: same data as the type. Paratypes: CONNECTICUT—Females (2), 14 June, 1920, New Haven (B. H. Walden). Males (2), 21 June, 1921, Danielson (J. T. Ashworth). Male, 26 June, 1916, South Meriden (H. L. Johnson). NEW YORK—Male and female, taken with the types. Females (4), 4-7 July, 1915, Bayshore, Long Island (C. E. Olsen). Female, 14 June, 1909, Pinelawn, Long Island (Wm. T. Davis). NORTH CAROLINA—Female, 30 June, 1912, Black Mountains (Beutenmuller). Males (2) and females (2), 8 June, 1916, Craggy Mountains (R. W. Leiby). SOUTH DAKOTA—Female, 25 June, 1919, Brookings (H. C. Severin).

**Polymerus opacus** Knight, new species.

Dorsum black, opaque, clothed with silvery and dusky, sericeous pubescence; antennal segment ii of male equal in thickness to segment i, slightly more slender in the female; legs black, coxae and basal half of femora yellowish.

*Male*: Length 4.3 mm., width 2 mm. Head: Width .91 mm., vertex .46 mm.; black, a small yellowish spot each side of vertex bordering eye; clothed with sericeous silvery pubescence and intermixed with dusky simple pubescence. Rostrum, length .94 mm., just attaining middle of venter, piceous, yellowish on joints.

Antennae: Segment i, length .49 mm., thickness .114 mm., black; ii, 1.74 mm., cylindrical, thickness .114 mm., narrowed at base, black, rather closely dusky pubescent and beset with more prominent black pubescent hairs; iii, .64 mm., tapering from thicker at base to more slender at apex, brownish black; iv, .66 mm., blackish.

Pronotum: Length .91 mm., width at base 1.6 mm.; black, scarcely shining, surface minutely granulate; clothed with sericeous silvery pubescence; anterior angles with a glabrous opaque spot, present in other species but more conspicuous in this form; lower pleural margin narrowly pale just before coxal cleft. Scutellum transversely rugulose, silvery to dusky pubescent. Sternum dull black, median line yellowish, pleura black; ostiolar peritreme yellowish, anterior lobe becoming fuscous.

Hemelytra: Embolar margins distinctly arcuate; black, opaque, clothed with silvery to dusky, sericeous pubescence; cuneus uniformly black, dark pubescent. Membrane uniformly brownish black, narrowly paler bordering apex of cuneus, veins yellowish to dusky.

Legs: Black, coxae, basal half of femora, and two basal segments of tarsi, yellow to fulvous; a nearly obsolete, narrow yellowish annulus just beneath knee.

*Female*: Length 4.8 mm., width 2.4 mm.; more robust and embolar margins more strongly arcuate than in the male, but very similar in coloration. Rostrum, length 1.06 mm., just attaining middle of sternum.

Breeds on *Aster umbellatus*.

Holotype: Male, 3 July, 1920, McLean Bogs, Tompkins County, N. Y. (H. H. Knight); author's collection. Allotype: same data as the type. Paratypes: Males (16) and females (10), taken with the types on *Aster umbellatus*. MAINE—Male and females (2), 19 July, males (4) and females (7), 22 July, female, 25 July, females (2), 26 July, 1909, Machias (C. W. Johnson). NEW YORK—Male, 20 July, 1917, males (2) and females (2), 3 Aug., male, 25, Aug., 1920, The Plains (C. J. Drake). VERMONT—Female, 11 July, 1908, Mt. Ascutney (C. W. Johnson). ONTARIO—Males and females (18), 10 July, female, 15 July, males (2) and females (2), 27 July, Parry Sound (H. S. Parish).

**P. venaticus** (Uhler).

Uhler, Hayden's Surv. Terr., Rept. for 1871, 414, 1872.

*Male*: Length 5.9 mm., width 2.3 mm.; hemelytra elongate, tip of abdomen attaining middle of cuneus, embolar margins very

slightly arcuate; black, moderately shining; thickly clothed with sericeous, pale pubescence, a few black hairs on embolium and cuneus; cuneus fulvous or reddish.

Head: Width 1.04 mm., vertex .46 mm. Rostrum, length 1.09 mm., just attaining middle of sternum, piceous, scarcely paler at joints. Antennae: Segment ii, length 2.31 mm., cylindrical, not equal to thickness of segment i.

Legs: Black, basal half of hind and middle femora, anterior face of front femora except apically, and two basal segments of tarsi, yellow.

*Female*: Length 5 mm., width 2.57 mm.; embolar margins strongly arcuate; shorter, more ovate and robust than the male; coloration similar to the male except the coxae; coxae always yellowish except for spot at base.

Uhler's description of the legs was undoubtedly drawn from a female specimen since the leg colors are distinctive of the sex in this species. A specimen in the U. S. N. M. collection has been labeled type, but that particular specimen could scarcely have served for the original description since it does not agree with the original in some essential characters. Uhler's statement "and sometimes the costal margin red or yellow" does not apply to *venaticus*, and the statement by itself implies that the type would not have the embolium yellow. In referring to the form with yellow embolium the author probably had in mind one of the eastern species herein described as *punctipes* or *fulvipes*. Of about 200 specimens of *venaticus* which the writer has examined, the embolium is never yellowish except narrowly at extreme apex.

Breeds on *Solidago altissima*.

Cheshire, 23 June, 1919 (M. P. Z.); Colebrook, 20 July, 1905 (W. E. B.); Green's Farms, 24 June, 1904 (W. E. B.); Litchfield, 22 July, 1920 (P. G.); West Haven, 27 June, 1904 (H. L. V.).

*P. venustus* Knight, new species.

*Male*: Length 5.2 mm., width 2.3 mm. Head: Width 1.01 mm., vertex .38 mm.; black, a yellow spot each side of vertex bordering eye, lower margin of jugum and upper margin of lorum, red; clothed with sericeous pale pubescence. Rostrum, length 1.14 mm., scarcely exceeding posterior margins of front coxae, piceous, paler at joints.

Antennae: Segment i, length .81 mm., black, unusually long and thickened (.157 mm. thick); ii, 2.06 mm., cylindrical, thickness .07 mm., yellowish, apical one-third black, pubescence taking color of surface beneath; iii, 1.02 mm., slender, yellowish to fuscous, darker apically; iv, 1.03 mm., blackish.

Pronotum: Length 1.03 mm., width 1.74 mm.; surface minutely granulate and transversely wrinkled; clothed with yellowish to golden, sericeous pubescence; black, lower pleural margin slenderly reddish. Scutellum black, surface and pubescence as on

pronotal disk. Sternum and pleura black; ostiolar peritreme yellowish to reddish.

Hemelytra: Embolar margins moderately arcuate; black, opaque, surface rather irregularly roughened, somewhat scabriculous; clothed with golden and dusky sericeous pubescence. Membrane uniformly dark fuscous, scarcely paler bordering apex of cuneus, veins yellowish.

Legs: Coxae and basal half of femora deep translucent red, lateral aspect of coxae, but more apically on front pair, becoming fuscous; apical one-half to one-third of femora black, a blackish cloud forming on anterior face of front pair near base; tibiae yellowish to fulvous, basal one-third and the apices black; tarsi yellowish, apical half of third segment fuscous. Venter black, clothed with sericeous silvery pubescence, and on genital segment with simple yellowish dusky hairs.

*Female*: Length 5.7 mm., width 2.6 mm.; embolar margins more strongly arcuate apically; more robust than the male but very similar in coloration; antennal segment i equally thick as that of the male but segment ii slightly more slender.

Holotype: Male, 3 July, 1919, Warren Woods, Berrien County, Mich. (R. F. Hussey); author's collection. Allotype: taken with type. Paratypes: FLORIDA—Females (2), 23 Mar., 1921, Dunedin (W. S. Blatchley). MICHIGAN—Male and female, 26 June, male and females (3), 27 June, male, 3 July, type locality; males (3) and females (2), 30 June, 1919, male, 5 July, 1920, New Buffalo, Berrien County (R. F. Hussey). NORTH CAROLINA—Male, 21 June, Fayetteville (C. S. Brimley). VIRGINIA—Male, July, 1908, Hampton.

*Polymerus gerhardi* Knight, new species.

*Female*: Length 6.4 mm., width 2.8 mm. Head: Width 1.16 mm., vertex .51 mm.; black, vertex pale at each side; clothed with sericeous white pubescence. Rostrum, length 1.08 mm., not attaining hind margins of front coxae, piceous, basal segment and joints reddish.

Antennae: Segment i, length .64 mm., thickness .143 mm., black; ii, 2.03 mm., thickness .086 mm., cylindrical, black, rather closely blackish pubescent; iii, .96 mm., fusco-brownish; iv, .88 mm., fuscous.

Pronotum: Length 1.24 mm., width at base 2.14 mm.; black, scarcely shining, rather irregularly rugulose; thickly clothed with sericeous white pubescence; margins of xyphus, and narrow lower margins of pleura, yellowish. Scutellum black, pubescent as on pronotal disk. Sternum and pleura black; ostiolar peritreme yellowish.

Hemelytra: Embolar margins moderately arcuate; black, opaque, thickly clothed with sericeous white pubescence intermixed with more erect, simple black pubescent hairs. Membrane and veins uniformly dark brownish black, scarcely paler bordering apex of cuneus.

Legs: Coxae and femora deep red, coxae more yellowish or orange; tips of femora, tibiae, and tarsi, black; tibiae unusually thick for the genus, spines and pubescence also black. Venter black, thickly clothed with sericeous white pubescence and intermixed with more erect, dark pubescent hairs.

Holotype: Female, 1 July, 1911, Hessville, Ind. (W. J. Gerhard); author's collection. Paratypes: Females (5), collected "at light" with the type. Among material from the U. S. National Museum the writer finds a specimen, male, 15 April, 1906, Cotulla, Texas (F. C. Pratt), that apparently belongs to this species although it is much smaller than the females from Indiana.

The writer takes pleasure in naming this large and beautiful species after the collector, Mr. W. J. Gerhard.

### Poecilocapsus Reuter.

**P. lineatus** (Fabricius). Four-lined leaf bug. (Plate xvi, 18.)

*Lygaeus lineatus* Fabricius, Ent. Syst. Suppl., 541, 1798,  
Cornell Univ. Agr. Expt. Sta., Bull. 58, 1893.

Length 7-7.5 mm., width 3.5 mm.; greenish yellow with four black lines on the dorsum; certain specimens have the yellow of the hemelytra replaced with bright green.

Breeds on a large number of herbaceous plants, but especially on *Rumex*; occasionally becomes a pest on currant bushes.

Bantam, 19 June, 1914 (W. E. B.); Branford, 23 June, 1905 (H. L. V.); 29 June, 1905 (H. W. W.); New Haven, 12 June, 1896 (W. E. B.); 14 June, 1905 (B. H. W.); Stonington, 5 July, 1906 (J. A. H.).

### Horcias Distant.

#### Key to color varieties of *dislocatus* Say.

- |   |                                    |
|---|------------------------------------|
| 1. Color red and black .....  | 2                                  |
| Color black with pale, or entirely black .....  | 7                                  |
| 2. Pronotum more or less black .....  | 3                                  |
| Pronotum uniformly red .....  | 4                                  |
| 3. Pronotal disk bivittate with black on basal half ....  | typical <i>dislocatus</i>          |
| Pronotal disk black on basal half but not vittate ..  | variety <i>goniphorus</i>          |
| 4. Hemelytra red or only slightly infuscated .....  | 5                                  |
| Hemelytra broadly black, or entirely black .....  | 6                                  |
| 5. Scutellum black .....  | variety <i>coccineus</i>           |
| Scutellum red as well as the whole dorsum ....  | variety <i>rubellus</i> n. var.    |
| 6. Hemelytra uniformly black .....  | variety <i>residuus</i>            |
| Hemelytra with lateral margins red .....  | variety <i>gradus</i> n. var.      |
| 7. (1) Pronotum more or less pale .....   | 8                                  |
| Pronotum uniformly black .....  | 12                                 |
| 8. Scutellum uniformly black .....  | 9                                  |
| Scutellum with median line pale .....   | 10                                 |
| 9. Hemelytra with lateral margins broadly pale, claval suture never pale .....                  | variety <i>limbatellus</i>         |
| Hemelytra with lateral margins slenderly pale, claval suture bordered each side with pale ..... | variety <i>scutatus</i> n. var.    |
| 10. Clavus with pale .....  | 11                                 |
| Clavus uniformly black .....  | variety <i>nigriclavus</i> n. var. |

11. Corium black bordering claval suture ..... variety *affinis*  
Corium pale bordering claval suture ..... variety *flavidus* n. var.
12. (7) Hemelytra uniformly black, or only slenderly pale at base of  
radius ..... 13  
Costal margin and frequently base of radius, pale .. variety *marginalis*
13. Legs pale testaceous, or blackish only at base of femora .....  
Femora black, or only the apices pale, tibiae chiefly testaceous .... variety *pallipes*  
variety *nigritus*

**H. dislocatus** (Say) typical. (Plate xvi, 19.)

*Capsus dislocatus* Say, Heter. N. Harm., 21, 1832; Compl. Writ, i, 339, 1859.

Bull. Buff. Soc. Nat. Sci., x, 484, 1912.

Length 6.2 mm., width 3 mm.; pale rufo-sanguineous; antennal segments i and ii, tylus, juga, base of vertex, two wedged-shaped approximate spots on basal half of pronotal disk, scutellum excepting median line, inner half of clavus, inner apical angles of corium, membrane, pleura, coxae excluding the anterior pair, and venter, black.

Food plants: *Smilacina racemosa*, *Geranium maculatum*, *Scrophularia leporella*, and occasionally *Caulophyllum thalictroides*. The different color varieties may occur on any of these food plants.

Branford, 3 July, 1905 (H. W. W.); Cornwall, 1 July (B. H. W.); New Haven, 1 June, 1911 (B. H. W.); 6 July, 1904 (H. L. V.); Wallingford, July, 1911 (D. J. C.).

**H. dislocatus** var. *coccineus* (Emmons).

*Phytocoris coccineus* Emmons, Nat. Hist. N. Y., Agr., v, pl. 30, fig. 2, 1854.

Bull. Buff. Soc. Nat. Sci. x, 484, 1912.

Similar to *dislocatus* except that the pronotum and hemelytra are nearly or quite immaculate, the scutellum entirely black.

Branford, 29 June, 1905, 5 July, 1905 (H. W. W.).

**H. dislocatus** var. *rubellus* Knight, new variety.

Similar to *coccineus* but the scutellum as well as the whole dorsum, uniformly bright red.

Holotype: Male, 18 June, 1919, University Farm, St. Paul, Minn. (H. H. Knight). Paratypes: Males and females (6), topotypic. Female, 8 July, 1914, Lake Itasca, Minn. (S. A. Graham).

**H. dislocatus** var. *goniphorus* (Say).

*Capsus goniphorus* Say, Heter. N. Harm., 21, 1832: Compl. Writ, i, 341, 1859.

Bull. Buff. Soc. Nat. Sci., x, 484, 1912.

Similar to *dislocatus* except the black on pronotum not divided: uniformly black on scutellum, clavus, and corium; femora and front coxae black.

Branford, 13 July, 1919 (B. H. W.); 28 July, 1905 (H. L. V.); Killingworth, 27 June, 1920 (W. E. B.); New Haven, 1 June, 1911 (B. H. W.); Norwalk, 24 June, 1920 (W. E. B.).

**H. dislocatus** var. **gradus** Knight, new variety.

Similar to variety *goniphorus* except that the pronotum is uniformly red and the hemelytra more broadly black.

Holotype: Male, 19 June, 1919, University Farm, St. Paul, Minn. (H. H. Knight). Paratypes: Males (3), topotypic.

**H. dislocatus** var. **residuus** Van Duzee.

Bull. Buff. Soc. Nat. Sci., x, 484, 1912.

Hemelytra and scutellum black, pronotum uniformly red.

Indiana, Minnesota, Ohio.

**H. dislocatus** var. **limbatellus** (Walker).

Cat. Heterop., vi, 93, 1873.

Similar to variety *goniphorus* except that the red is replaced by yellow or pale.

Branford, 5 July, 1905 (H. W. W.); New Haven, 1 June, 1911 (B. H. W.).

**H. dislocatus** var. **affinis** (Reuter).

Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxii, No. 9, 74, 1876.

Similar to typical *dislocatus* but the red color replaced by fulvo-testaceous, hemelytra more broadly black; claval vein and spreading to margin, along radius, narrow costal margin, and cuneus except apex, fulvo-testaceous; corium never pale bordering claval suture.

Kent, 27 June, 1920 (K. F. C.); New Haven, 18 June, 1918 (M. P. Z.); Norwalk, 24 June, 1920 (W. E. B.); Wilton, 24 June, 1920 (M. P. Z.).

**\*H. dislocatus** var. **flavidus** Knight, new variety.

Similar to variety *affinis* but more broadly pale; corium broadly pale bordering clavus.

Holotype: Male, 4 July, 1916, Four Mile, N. Y. (H. H. Knight). Paratypes: Males and females (7), topotypic. CONNECTICUT—Male, 24 June, Wilton (M. P. Zappe). Male, 24 June, Norwalk (W. E. Britton). Female, 27 June, Kent (K. F. Chamberlain). New York—Female, 12 July, Batavia; Female, 21 June, males (2), 27 June, 1914, Portageville (H. H. Knight).

**H. dislocatus** var. **scutatus** Knight, new variety.

Similar to variety *flavidus* but with black color on disk of pronotum undivided and the scutellum uniformly black.

Holotype: Female, 4 July, 1916, Four Mile, N. Y. (H. H. Knight).

**H. dislocatus** var. **nigriclavus** Knight, new variety.

Similar to variety *affinis* but with clavus uniformly black, radius pale on basal half; black color on pronotal disk scarcely divided at basal margin by median pale vitta.

Holotype: Male, 5 July, 1915, Four Mile, N. Y. (H. H. Knight). Paratypes: Males (9) and females (7), topotypic. Female, 18 June, 1914, Batavia; males (3), 14 June, 1914, Ithaca; female, 22 June, 1916, male, 27 June, 1915, Portageville (H. H. Knight).

**H. dislocatus** var. **marginalis** (Reuter).

*Poecilopsus marginalis* Reuter, Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxii, No. 9, 75, 1876.

Bull. Buff. Soc. Nat. Sci., x, 484, 1912.

Black, slender costal margin and usually line on base of radius, white; both vertex and the tibiae more or less pale.

New York.

**H. dislocatus** var. **pallipes** Van Duzee.

Bull. Buff. Soc. Nat. Sci., x, 484, 1912.

Black, legs pale testaceous, or blackish only at base of femora. South Meriden, June (H. L. J.).

**H. dislocatus** var. **nigritus** Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 41, 1909.

Bull. Buff. Soc. Nat. Sci., x, 484, 1912.

Black, apices of femora, and tibiae chiefly, testaceous; sometimes with vertex and slender line on base of radius pale.

Branford, 13 June, 1919 (B. H. W.); Cornwall, 3 July, 1920 (K. F. C.); Darien, June; New Haven, 6 July (H. L. V.); South Meriden, July; Winnipauk, June.

**Adelphocoris** Reuter.

**A. rapidus** (Say). (Plate xvi, 21.)

Compl. Writ., i, 339, 1859.

Length 7 mm., width 2.8 mm.; dark brown, hemelytra with costal margins pale; pronotum yellowish brown and with two black spots.

Common species; breeds on *Rumex* in the northern states.

Branford, 19 Sept., 1904 (H. W. W.); Chapinville, 27 Aug., 1904 (W. E. B.); East Hartford, 2 Aug., 1905 (B. H. W.); Hamden, 14 July, 1911 (W. E. B.); New Haven, 24 June, 1902 (E. J. S. M.), 19 July, 1905, 29 Sept., 1902 (B. H. W.); Scotland, 27 July, 1904 (B. H. W.); Stafford, 24 Aug., 1905 (W. E. B.); Torrington, 7 July, 1905 (W. E. B.); West Haven, 27 June, 1905 (H. L. V.); Yalesville, 19 Oct., 1903 (H. L. V.).

**Calocoris** Fieber.

**C. norvegicus** (Gmelin).

*Cimex norvegicus* Gmelin, in Linnaeus, Syst. Nat., Edn. 13, i, pt. 4, 2176, 1788.

Reuter, Hem. Gymn. Eur., v, 204, 377, pl. 7, fig. 4, 1896.

Length 6.7 mm., width 2.6 mm.; yellowish green, with two small black spots on pronotum, one behind each callus; clothed with black and golden yellow pubescence intermixed.

Occurs on grasses.

Greenwich, 24 June, 1921 (W. E. B.); Stratford, 9 July, 1920 (B. H. W.).

**Paracalocoris** Distant.

*Key to Species.*

- i. Hind tibiae thickly clothed with long erect hairs which obscure or become confused with the tibial spines ..... **scrupens**
- Hind tibiae with hairs shorter and more appressed, especially on inner side, hairs not easily confused with the true spines ..... 2



2. Antennal segment i as long as, or longer than pronotum ..... 3  
Antennal segment i shorter than length of pronotum ..... 4
3. Basal width of pronotum exceeding 2 mm.; color everywhere except discal spots and membrane, a lighter or darker reddish brown ..... *adustus*  
Basal width of pronotum less than 2 mm.; coloration chiefly fusco-piceous, frequently pale on costal margin ..... *hawleyi*
4. Antennal segment ii not exceeding 2.2 mm., in length ..... 5  
Antennal segment ii at least 2.4 mm. in length, usually longer; segment i nearly equaling length of pronotum; basal width of pronotum at least 2.2 mm., usually greater ..... *limbus*
5. Color above pale brown, mottled with several large and numerous minute yellow spots, largest spots at middle and apex of corium, the apical half of scutellum yellow; legs and antennal segment i with brown and yellow variegated, segment ii with apical one-third black ..... *multisignatus*  
Otherwise colored ..... 6
6. Color dull tawny red, variegated with yellow; indistinctly striped with yellow on pronotum, scutellum, and hemelytra; form short and broad ..... *heidemanni*  
Color stramineous to dark brownish gray, or dark brown, variegated with paler maculae; antennal segment ii with narrow annulus at base and the apical one-third blackish, basal half yellowish brown but paler at each extremity bordering the black color ..... *colon*

*Key to color varieties of *scrupeus* Say.\**

1. Hemelytra with costal margin colored similarly to disk of corium ..... 2  
Hemelytra with costal margin, or at least the cuneus, distinctly paler in color than disk of corium ..... 9
2. Pronotum with dark markings in addition to the discal spots ..... 3  
Pronotum without definite dark markings in addition to discal spots ..... 8
3. Pronotal disk and scutellum orange to pale red, anterior to discal spots dusky to piceous, basal angles of disk usually with piceous dots or more or less clouded ..... 4  
Pronotal disk otherwise marked ..... 5
4. Corium fusco-piceous ..... *typical scrupeus*  
Corium dark red, cuneus somewhat lighter ..... *variety rubidus*
5. Pronotum very dark ..... 6  
Pronotum pale except for indistinct vittae and dusky maculations from discal spots to posterior margin, and between these and lateral margins; a broad pale vitta traversing scutellum, thorax, and top of head; corium yellowish brown ..... *variety percursus*
6. Scutellum dark ..... 7  
Scutellum chiefly yellowish or reddish; pronotal disk dark above except for a median and two lateral areas in line with the discal spots ..... *variety triops*
7. Scutellum piceous; pronotal disk with two lateral yellow areas ..... *variety diops*  
Scutellum dusky with median pale vitta, spots on clavus and corium yellowish red ..... *variety delta*
8. (2) Corium reddish brown with yellowish dots ..... *variety compar*  
Corium except apex, clavus except base and slender inner margin, uniformly orange-red ..... *variety ardens*

\* This key is largely an adaptation from the work of Mr. W. L. McAtee (Ann. Ent. Soc. Am., ix, 369, 1916) although specimens of each variety are at hand for study.

9. (1) Cuneus and sometimes spots on corium lighter in color than disk ..... 10  
Cuneus and costal margin entirely reddish or yellowish ..... 13
10. Pronotal disk orange to pale red, anterior to discal spots dusky or even piceous, basal angles of disk clouded or with piceous dots  
variety *cunealis* ..... 11
11. Pronotal disk dark or dusky, with paler vittae laterad of discal spots and extending distad, also a light median patch which frequently extends to near basal margin ..... 12  
Pronotal disk except discal spots and the anterior one-third, scutellum, cuneus, and hemelytral maculations, pale yellow .....  
variety *lucidus*
12. Scutellum dark, with distinct median light vitta ..... variety *par*  
Scutellum sordid or clouded yellow ..... variety *sordidus*
13. (9) Pronotum without dark markings between discal spots and basal margin ..... 14  
Pronotum with dark markings between discal spots and basal margin ..... 15
14. Hemelytra with bootjack-shaped dark area, embolar margins, scutellum, and basal half of pronotum, yellowish or reddish .....  
variety *bidens*  
Hemelytra with bootjack-shaped mark obsolete, dorsal surface except base and inner apical angle of corium, and slender inner margin of clavus, reddish or yellowish ..... variety *ardens*
15. Pronotal disk with anterior one-third darkened ..... 16  
Pronotal disk with anterior one-third yellowish or reddish .....  
variety *bicolor*
16. Scutellum dusky, median line paler ..... 17  
Scutellum chiefly yellowish, median pale vitta bounded each side by a more or less complete wedge-shaped dark mark; corium and clavus spotted with yellow ..... variety *varius*
17. Clavus and adjacent parts of corium dusky ..... variety *nubilus*  
Clavus and adjacent parts of corium spotted with yellowish red .....  
variety *delta*

**P. scrupeus** (Say), variety typical.

*Capsus scrupeus* Say, Heter. N. Harm., 23, 1832; Compl. Writ., i, 342, 1859.

Ann. Ent. Soc. Am., ix, 370, 1916.

Length 6.5 mm., width 2.6 mm., length of pronotum 1.33 mm.

Antennae: Segment i, length 1.47 mm.; ii, 2.36 mm.; iii, .91 mm.; iv, .97 mm.

This species is remarkable for the large number of color varieties it exhibits.

Breeds most frequently on wild grapevine (*Vitis* sps.), but occurs on cultivated varieties.

New Haven, 27 June, 1909 (W. E. B.); Wallingford, 14 June, 1911 (J. K. L.).

**P. scrupeus** var. *bidens* McAtee.

Ann. Ent. Soc. Am., ix, 374, 1916.

This variety is well distinguished in the key.

South Meriden, July (H. L. J.).

**P. adustus** McAtee.

Ann. Ent. Soc. Am., ix, 377, 1916.

Length 8 mm., width 3 mm. Antennae: Segment i, 1.6 mm.; ii, 2.53 mm.; iii, 1.16 mm.; iv, 1.1 mm. Color almost uniform reddish brown, a little paler on cuneus and lower surface; inclining to fuscous on antennae, tibiae, and inner margins of clavus and corium; dorsum clothed with rather abundant short pale yellow hairs.

New Jersey.

*Key to color varieties of howleyi Knight.*

1. Hemelytra with costal margins pale or yellowish ..... 2  
Hemelytra without pale costal margins ..... 3
2. Costal stripe undivided, though it may contain a dark blotch at middle of costal margin ..... typical **howleyi**  
Costal stripe divided by a dark vitta which is broader posteriorly, leaving a very narrow pale costal margin ..... variety **fissus**
3. Hemelytra except cuneus almost uniform fusco-piceous, although radius and costa may be pale ..... variety **ancora**  
Hemelytra and other parts of dorsum more or less spotted with yellow ..... variety **pallidulus**

**P. howleyi** Knight, variety typical.

Ann. Ent. Soc. Am., ix, 377, 1916.

Length 6.3 mm., width 2.4 mm. Antennae: Segment i, length 1.38 mm.; ii, 2.27 mm.; iii, 1 mm.; iv, .61 mm. Length of pronotum 1.22 mm. Color fusco-piceous to piceous, costal margins of hemelytra pale to yellowish, cuneus reddish; clothed with very fine pale and fuscous pubescence.

Breeds on cultivated hop in New York.

Massachusetts, New York.

**P. howleyi** var. **ancora** Knight.

Ann. Ent. Soc. Am., ix, 378, 1916.

Occurs with the typical variety.

Massachusetts, New York.

**P. howleyi** var. **fissus** McAtee.

Ann. Ent. Soc. Am., ix, 379, 1916.

Massachusetts, New York.

**P. howleyi** var. **pallidulus** McAtee.

Ann. Ent. Soc. Am., ix, 380, 1916.

Breeds on apple in New York.

**P. limbus** McAtee.

Ann. Ent. Soc. Am., ix, 380, 1916.

Length 7.5 mm., width 3 mm.; length of pronotum 1.52 mm. Antennae: Segment i, length 1.55 mm.; ii, 2.7 mm.; iii, 1.16 mm.; iv, 1.25 mm. Fuscous to blackish, head except tylus and clouding on frons, pronotum except on basal half behind discal spots, embolium and margin of corium, and cuneus, yellowish to reddish.

Massachusetts, Georgia.

*Key to varieties of colon Say.*

1. Antennal segment ii with narrow pale annulus next to blackish base, brownish beyond but paler again at middle; hemelytra pale to grayish and with darker brown spots, or with background chiefly brownish and spotted with pale yellowish .....typical colon  
Antennal segment ii pale or brownish on basal half but without a distinctly paler annulus next to the blackish base ..... 2
2. Hemelytra practically unicolorous pale to stramineous ..variety *castus*  
Hemelytra uniformly dark reddish brown to fusco-piceous, or with markings lighter than ground color ..... 3
3. Hemelytra always more or less spotted with yellow, and usually the pronotum; pronotum varying from reddish to fuscous, frequently vittate .....variety *colonus*  
Hemelytra without yellow spots, cuneus reddish and sometimes spotted .....variety *amiculus*

**P. colon (Say).**

Compl. Writ., i, 346, 1859.

Length 5.8 mm., width 2.5 mm.; length of pronotum 1.33 mm. Antennae: Segment i, length 1.1 mm., brownish, spotted with yellow, the spots more or less confluent, clothed with blackish semi-erect hairs, in length scarcely equaling thickness of segment; ii, 2.22 mm., narrow base and the apical one-third black, brownish between but with pale annulus bordering the black, finely pubescent; iii, .97 mm., pale to fuscous, becoming darker at apex; iv, 1.08 mm., pale fuscous, darker at apex.

Dorsum pale yellowish to grayish or dark brown, spotted with yellow, in paler specimens the brown forming large spots, clothed with pale yellowish to golden pubescence; membrane fuscous, paler at middle and a spot each side just beyond tip of cuneus. Ventral surface brownish, each segment of venter with two or three longitudinal yellow marks on the sides.

Legs yellowish, apical one-third of femora and two bands on tibiae brownish, the brown color spotted with yellow; in dark specimens the hind femora developing a brownish patch on basal half.

New Jersey, New York.

**P. colon var. colonus McAtee.**

Ann. Ent. Soc. Am., ix, 383, 1916.

Length 5-6 mm., width 2.1-2.7 mm.; reddish brown to fusco-piceous, dorsum more or less spotted with yellow; variable in size and color but readily distinguished in the key.

Food plant: Virginia creeper (*Psedera quinquefolia*).

New Jersey, New York, Massachusetts, Vermont.

**Stenotus Jakovlev.****S. binotatus (Fabricius).** (Plate xvi, 20.)

*Lygaeus binotatus* Fabricius, Ent. Syst., iv, 172, 1794.

Reuter, Hem. Gymn. Eur., v, 123, pl. 5, fig. 5, 1896.

*Male*: Length 6 mm., width 2 mm.; chiefly yellowish green below, pronotum with two broad black rays; hemelytra yellowish orange, with two broad, irregular, longitudinal blackish stripes.

*Female*: Length 7 mm., width 2.4 mm.; yellowish green, pronotum with two prominent black spots on disk, one behind each callus; corium with longitudinal fuscous stripe.

Breeds on *Dactylus glomerata*, and probably to some extent on other grasses.

Branford, 13 June, 1918 (B. H. W.); New Haven, 16 June, 25 June, 2 July, 1920 (B. H. W.); Stamford, 24 June, 1920 (W. E. B.).

### Garganus Stål.

#### G. fusiformis (Say).

Compl. Writ., i, 344, 1859.

Length 3.8-4 mm., width 1.5 mm.; black, embolium, outer margin of cuneus, and narrowly along commissure, pale; legs, antennal segment i, and sometimes the venter, reddish yellow.

Breeds on *Tussilago farfara*, and occurs on other herbaceous plants found growing in damp situations.

Branford, 29 July, 1905 (H. W. W.); Cornwall, 10 Aug., 1918 (B. H. W.).

### Neurocolpus Reuter.

#### N. nubilis (Say).

Compl. Writ., i, 341, 1859.

Length 5.7-6.8 mm., width 2 mm.; exceedingly variable in coloration; usually light yellowish brown to reddish brown or black.

Food plants: *Cephalanthus occidentalis*, *Rhus* sp., and probably others.

Cornwall, 10 Aug., 1919 (B. H. W.); Hamden, 24 July, 1910 (B. H. W.); 9 Aug., 1920 (M. P. Z.); New Haven, 6 July, 1904 (H. L. V.); 13 July, 1904 (W. E. B.); 16 Aug., 1904 (B. H. W.).

### Phytocoris Fallén.

#### Key to Groups of Phytocoris.

1. Wing membrane conspurcate, or irrorate with pale; median lobe of male genital structure provided with a flagellum, without (*juncus* excepted) or rarely bearing distinct teeth ..... (p. 616) Group I
- Wing membrane either marbled, uniformly fuscous, or nearly pale, never distinctly conspurcate (except perhaps in well marked forms of *quercicola*), sometimes with margins of fuscous areas separating into small specks but more marbled than conspurcate; median lobe of male genital structure with a flagellum bearing distinct teeth ..... 2
2. Antennal segment i, in length, distinctly greater than width of head ..... 3
- Antennal segment i, in length, not equal to width of head ..... (p. 641) Group III
3. Antennae more blackish or fuscous than pale, if segment ii broadly

pale on middle, then the dorsum chiefly fuscous to blackish; general coloration fuscous or blackish on a paler background .....

(p. 631) Group II

Antennae more nearly pale, yellowish, or reddish than blackish, segment ii sometimes fuscous at apex and near base but more pale than fuscous (in *tibialis* with a slender fuscous line on anterior face); general coloration usually yellowish to reddish over a paler background ..... (p. 644) Group IV

*Key to Species of Group I.*

1. Antennal segment i greatly thickened, cylindrical, thickness nearly equal to dorsal width of an eye ..... 2  
 Antennal segment i more slender, thickness distinctly less than dorsal width of an eye ..... 4
2. Antennal segment ii uniformly yellowish, scarcely dusky at apex ..... 3  
 Antennal segment ii yellowish, blackish on apical one-fourth ..... (p. 617) *lasiomerus*
3. Antennal segment i with two distinct types of hairs, set with erect black bristle-like hairs and between with shorter, more recumbent, sparsely set black hairs; scutellum with reddish each side of median line, clothed with sericeous white pubescence ..... (p. 618) *pallidicornis*  
 Antennal segment i with shortest of black hairs so long as to be easily confused with the erect bristle-like hairs; scutellum uniformly yellowish, sparsely clothed only with simple erect pubescent hairs ..... (p. 619) *rubropictus* n. sp.
4. (1) Antennal segment ii chiefly blackish, usually annulated with pale ..... 5  
 Antennal segment ii uniformly yellowish, frequently somewhat dusky at apex and near base; dorsum chiefly reddish on a pale yellowish background ..... (p. 620) *ulmi*
5. Antennal segment ii black at base, with a pale annulus somewhat removed from base ..... 6  
 Antennal segment ii with pale annulus at base; blackish beyond ... 7
6. Antennal segment i, in length, equal to length of head and pronotum taken together, also greater than width of pronotum at base; basal submargin of pronotal disk with four black callous spots, two each side of median line ..... (p. 624) *antennalis*  
 Antennal segment i, in length, only equal to length of pronotum plus one-third length of head, likewise not equal to width of pronotum at base ..... (p. 621) *palmeri*
7. (5) Antennal segment iii with pale annulus at base and at middle ..... 8  
 Antennal segment iii with pale annulus only at base, sometimes obsolete ..... 9
8. Dorsum bearing both black and white scale-like hairs, turned on edge; propleura pale on lower half but without distinct white line above middle of coxal cleft; lower half of face with some fuscous ..... (p. 626) *conspurcatus*  
 Dorsum without distinct scale-like hairs; propleura white, black along dorsal margin, with a clear-cut black line across lower half of coxal cleft and extending to basal margin; lower half of face white ..... (p. 624) *davisi* n. sp.
9. Antennal segment ii black, a pale band at base but at most only narrowly pale on middle ..... 10  
 Antennal segment ii broadly pale yellowish to dusky on middle, dark fuscous only at apex and next to pale band at base; small slender species, length 5.1 mm. .... (p. 622) *minutulus*
10. Antennal segment iii pale at base ..... 11

- Antennal segment iii uniformly brownish black; pronotal disk with base and lateral margins black although extreme basal edge slenderly pale, central area yellowish green but sometimes with slender median vitta indicated in black; calli black, or in pale forms indicated with black lines; tibiae brownish black, indistinct pale spots apparent; length 8.5 mm ..... (p. 621) *juncus* n. sp.
11. Lower half of head blackish, without clearly marked white areas; male genital segment and claspers distinctive (fig. 149: 6) ..... (p. 629) *corticeviventis*
- Lower half of head chiefly white, sometimes with black bar across middle of tylus, dorsal margins of juga and lora dark reddish black but the white areas never obscured ..... 12
12. Corium without distinct longitudinal black vitta on a grayish background ..... 13
- Corium with longitudinal black vitta along middle of apical half, set on a grayish background, radius indicated by an interrupted series of black spots; antennal segment i, in length, equal to distance between tylus and basal margin of pronotum, segment ii pale at base but interrupted beneath with blackish line ..... (p. 627) *vittatus*
13. Antennal segment ii with the pale band situated at slightly beyond middle; tylus with distinct black band across middle, its lower margin just in line with dorsal margins of lora; male genital segment without tubercle at base of left clasper.. (p. 630) *dimidiatus*
- Antennal segment ii with pale band at middle; tylus without heavy black band across middle although frequently with an incomplete dark reddish spot at about that point ..... 14
14. Pronotum strongly sulcate at sides and immediately behind calli; apical half of hind femora with three or four large pale marks, somewhat confluent on posterior aspect ..... (p. 626) *sulcatus*
- Pronotum not distinctly sulcate at sides or behind calli; hind femora chiefly black, with not more than one prominent white band on apical half ..... 15
15. Hind femora brownish black, apical half with small pale dots only; pale band at middle of antennal segment ii nearly obsolete ..... (p. 629) *fumatus*
- Hind femora black, with a distinct white oblique band just before apex; pale band at middle of antennal segment ii very distinct (p. 628) *tuberculatus*

### *P. lasiomerus* Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 34, 1909.

*Male*: Length 7.6 mm., width 2 mm. Head: Width 1.03 mm., vertex .47 mm., length .86 mm.; only very slightly inclined, eyes somewhat removed from pronotal collar, tylus prominent, clothed with prominent yellowish pubescence; reddish upon a yellowish background, median line of front yellowish, transversely marked with red at each side; collum reddish, median line and a mark at each side behind dorsal margin of eye, red. Rostrum, length 3.2 mm., reaching to hind margin of fourth abdominal segment, yellowish, blackish at apex.

Antennae: Segment i, length 1.66 mm., thickness .17 mm., yellowish, irregularly marked with red, apex reddish, clothed with half erect black hairs and interspersed with more erect bristle-like hairs which in length equal or slightly exceed thickness of seg-

ment; ii, 3.1 mm., uniformly slender, yellowish, apical one-fourth blackish, finely yellowish pubescent except on blackish apex; iii, 2.15 mm., yellowish, dusky at apex; iv, 1.54 mm., pale fuscous.

Pronotum: Length 1.07 mm., width at base 1.69 mm.; collar rather broad and flattened; lateral margins distinctly sulcate, coxal cleft visible from dorsal aspect; fusco-brownish and tinged with reddish, central area of disk paler, more nearly fuscous laterally; lower pleural margin and lateral margins of xyphus, slenderly yellowish; disk clothed with short erect black hairs and intermixed with pale sericeous pubescence, collar beset with prominent black hairs. Scutellum fusco-brownish, paler at apex and basal angles, clothed with pale sericeous pubescence and intermixed with a few short dark hairs. Sternum yellowish to brownish red, pleura reddish, margins of sclerites paler; ostiolar peritreme pale, reddish to fuscous above ostiole.

Hemelytra: Elongate, embolar margins only very slightly arcuate; fusco-brownish upon a yellowish background, paler on embolium and irregularly so on outer margin of corium, clavus sometimes nearly fuscous; clothed with pale sericeous pubescence and intermixed with more erect short blackish hairs; cuneus yellowish translucent, apex reddish to blackish, inner half irregularly marked with reddish. Membrane irregularly conspurcate with fuscous, spotting less distinct on apical one-third and becoming clouded with fusco-brownish, veins reddish.

Legs: Yellowish, femora except base irregularly marked with dark reddish, the pale color appearing as irrorations, front and middle femora more nearly pale, ventral aspect transversely marked with fusco-reddish although somewhat irregularly; front tibiae infuscated at apex, hind pair irregularly marked with fusco-reddish on basal one-fourth; tarsi fuscous at apex.

Venter: Reddish to fusco-brownish, clothed with pale pubescence; genital segment with slight tubercle just above base of left clasper, claspers distinctive.

*Female*: Length 8 mm., width 2.5 mm.; very similar to the male but slightly more robust, hemelytra more reddish than fuscous.

Occurs on mixed herbaceous growth; probably phytophagous.

Litchfield, 22 July, 1920 (P. G.).

### ***P. pallidicornis* Reuter.**

Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxii, No. 9, 69, 1876.

Very similar to *lasioмерus* but distinguished by the uniformly yellowish antennal segment ii, and dorsum more thickly clothed with pale sericeous pubescence; hemelytra irregularly conspurcate with brownish, clavus never distinctly fuscous.

*Male*: Length 6.4 mm., width 2.06 mm. Head: Width 1.03 mm., vertex .37 mm. Antennae: Segment i, length 1.4 mm., thickness .18 mm., beset with erect black bristle-like hairs, and between with shorter, more recumbent, sparsely set black hairs; ii, 2.85 mm., uniformly yellowish, finely pale pubescent; iii, 1.83 mm., yellowish, becoming pale fuscous on apical half; iv, 1.38 mm., fuscous.



Pronotum: Length .97 mm., width at base 1.6 mm. Genital segment with less prominent tubercle above base of left clasper than in *lasiomerus*.

*Female*: Length 6.8 mm., width 2.4 mm.; slightly more robust than the male but very similar in coloration.

Occurs on mixed herbaceous growth; probably phytophagous. Massachusetts, New Hampshire, New York.

***Phytocoris rubropictus* Knight, new species.**

*Female*: Length 7.4 mm., width 2.5 mm. Head: Width 1.08 mm., vertex .51 mm.; very similar to *lasiomerus* but with brighter red. Rostrum, length 3.57 mm., yellowish to reddish, blackish on apex.

Antennae: Segment i, length 1.8 mm., thickness .26 mm., nearly equal to dorsal thickness of an eye, yellowish and irregularly marked with reddish, more uniformly reddish near apex, clothed with nearly erect black hairs and intermixed with bristle-like hairs which are easily confused with the former; ii, 3.2 mm., slender, pale, becoming brownish at apex and narrowly reddish at base, pale pubescent; iii, 2.14 mm., yellowish, dusky apically; iv, 1.67 mm., pale fuscous.

Pronotum: Length 1.11 mm., width at base 1.77 mm.; reddish, calli except outer margins, and a nearly quadrangular area on central portion of disk, yellowish, thus leaving basal margin and broad lateral margins red; lower margin of propleura pale to yellowish, also a somewhat indistinct yellowish ray across top of coxal cleft and extending to posterior margin; disk clothed with rather short blackish hairs, lateral margins and collar set with longer hairs, almost destitute of pale sericeous pubescence. Scutellum and mesoscutum uniformly yellow, rather sparsely clothed with short, pale to yellowish pubescent hairs. Sternum yellowish to reddish, pleura reddish to fuscous; ostiolar peritreme pale to reddish, more reddish above.

Hemelytra: Embolar margins moderately arcuate; dull reddish, irregularly irrorate with yellowish; clavus reddish, claval vein yellowish; corium reddish, inner and outer margins more yellowish than red; embolium yellowish but with more or less reddish developing in hypodermis; yellowish pubescent, rather sparsely set with groups of prostrate, pale sericeous pubescence; cuneus uniformly red, inner angle somewhat yellowish. Membrane pale fumate and conspurcate with fuscous, the spots coalescing apically to form fuscous margin at apex, veins red.

Legs: Yellowish, femora with small irregular reddish spots developing in hypodermis; hind femora with much less reddish than either *lasiomerus* or *pallidicornis*; tarsi fuscous on apices.

Venter: Yellowish to reddish, yellowish pubescent.

*Male*: Length 8 mm., width 2.5 mm.; similar to the female in coloration but in form more slender. Head: Width 1.11 mm., vertex .48 mm. Antennae: Segment i, length 1.97 mm., thick-

ness .26 mm., coloration and type of hairs similar to that of female; ii, 3.23 mm., slender, uniformly yellowish, narrowly reddish at base and tinged with brownish at apex; iii, 2.31 mm., yellowish; iv, missing. Pronotum, length 1.17 mm., width at base 1.81 mm. Venter: Chiefly reddish, genital segment becoming fuscous on base; tubercle above base of left genital clasper more prominent than that of *lasioomerus*, also a slight tubercle above base of right clasper.

Holotype: Female, 12 Aug., 1920, Wanakena, N. Y. (C. J. Drake); author's collection. Allotype: 15 Aug., 1907, Roque Bluff, Me. (J. A. Cushman).

*P. ulmi* (Linnaeus).

*Cimex ulmi* Linnaeus, Syst. Nat., Edn. 10, 449, 1758.

Reuter, Hem. Gymn. Eur., v, 281, pl. ix, fig. 5, 1896.

General aspect very suggestive of *pallidicornis* but distinguished at once by the more slender antennal segment i.

*Male*: Length 8 mm., width 2.5 mm. Head: Width 1.08 mm., vertex .46 mm.; chiefly reddish, paler on vertex, tylus and just above base fuscous and set with prominent black hairs. Rostrum, length 3.77 mm., attaining base of fifth abdominal segment, yellowish to reddish, apex blackish.

Antennae: Segment i, length 1.54 mm., thickness .114 mm., thicker at apex (.143 mm.), pale, brownish on dorsal aspect but broken into spots by irregular white glabrous areas, brownish pubescent and beset with several dark bristles which in length about equal thickness of segment; ii, 3.26 mm., slender, pale to yellowish, finely pale pubescent; iii, 2 mm., yellowish, scarcely darker apically; iv, 1.36 mm., pale fuscous.

Pronotum: Length 1.28 mm., width at base 2.11 mm.; reddish to dusky, darker on disk bordering the slenderly pale basal margin; clothed with yellowish pubescence and intermixed with short black hairs, anterior margin and collar beset with black bristles. Scutellum pale to yellowish, with reddish spot each side of median line on apical half. Sternum and pleura dark reddish to fuscous; ostiolar peritreme white.

Hemelytra: Embolar margins only very slightly arcuate; yellowish testaceous and darkened with reddish, the red color developing most strongly on apical half of cuneus, along claval veins, line on corium parallel to claval suture, and in spots along embolium; clothed with yellowish pubescence and intermixed with short black hairs. Membrane thickly conspurcate with fuscous, spots confluent on apex, a rather large pale area just beyond apex of cuneus but inclosing a fuscous spot set on margin; veins red.

Legs: Nearly as in *lasioomerus*. Venter dark reddish to fuscous; genital segment without indication of a tubercle above base of left clasper.

*Female*: Length 7.1 mm., width 2.4 mm.; pubescence and color-

ation very similar to that of male but hemelytra shorter and embolar margins somewhat more strongly arcuate.

A single specimen is at hand, female, 17 Aug., 1914, Yarmouth, NOVA SCOTIA (W. H. Brittain). Comparison has been made with European specimens of *ulmi* Linnaeus which were determined by Reuter.

Recorded in Europe as occurring on *Ulmus*, *Alnus*, *Quercus*, and other plants.

***P. palmeri* Reuter.**

Acta Soc. Sci. Fenn., xxxvi, No. 2, 32, 1909.

*Male*: Length 7 mm., width 1.7 mm. Sordid white-canescens, variegated with fuscous and black; sides of pronotum and thin band before basal margin blackish, disk fuscous to blackish vittate.

Antennae: Segment i linear, slender, variegated with white, equal in length to pronotum plus basal third of head, and but little shorter than basal margin of pronotum; segment ii very narrowly blackish at base, with a narrow white band just short of middle.

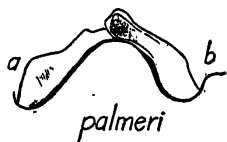


FIG. 134. *Phytocoris palmeri* Reuter,—male genital claspers, (a) left clasper, lateral aspect, (b) right clasper, lateral aspect. Greatly enlarged. Drawing by Dr. H. H. Knight.

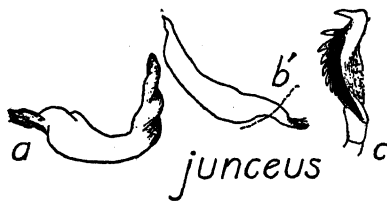


FIG. 135. *Phytocoris junceus* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) right clasper, lateral aspect, with outline of genital segment added, (c) flagellum. Greatly enlarged. Drawing by Dr. H. H. Knight.

Scutellum black, shining, basal angles and apical median line white. Membrane densely hyaline, conspurcate with blackish. Genital claspers distinctive (fig. 134), especially in the form of right clasper.

Described from Quinze Lake, Quebec. The figure of the male genital claspers was drawn from the type in the collection of E. P. Van Duzee.

***Phytocoris junceus* Knight, new species.**

*Male*: Length 9.2 mm., width 2.7 mm. Head: Width 1.11 mm., vertex .41 mm.; black, shining; collum pale, median line pale but with slender blackish line each side setting it off, also an oblique black line behind dorsal margin of each eye; vertex with slight groove on median line, each side with a prominent alutaceous spot; front beset with prominent brownish black hairs. Rostrum, length 3.6 mm., reaching upon sixth abdominal segment, brownish to piceous, darker apically.

Antennae: Segment i, length 1.21 mm., thickness .11 mm., slightly thicker at apex, fuscous to black, with six or seven small pale spots on dorsal surface, clothed with fine black hairs and interspersed with several erect black bristles on inner and dorsal surface; ii, 3.2 mm., slender, cylindrical, clothed with short blackish pubescent hairs, fuscous to black, becoming black apically; iii, 2 mm., uniformly blackish; iv, 1 mm., uniformly blackish.

Pronotum: Length 1.17 mm., width at base 2.03 mm.; black, moderately shining, pale to yellowish between calli and on central area of disk, thus leaving basal and lateral margins broadly black, but with basal margin slenderly pale; clothed with short erect black hairs, a single prominent black bristle at anterior angles of disk, collar beset with several bristles, paler area of disk also with finer and more recumbent yellowish pubescence; xyphus and lower pleural margins pale to greenish. Scutellum black, slightly shining, strongly convex, clothed with blackish hairs, basal angles whitish; mesoscutum rather broadly exposed, blackish, a yellowish spot near lateral margins. Sternum and pleura black, pleura more strongly shining, lower margin of epimera of mesothorax and the ostiolar peritreme, white.

Hemelytra: Black with pale; clavus largely pale but with margins and claval vein black; corium black, a prominent pale spot on middle, a pale indication near base, and with slender pale streak on apical area bordering radius, also somewhat pale along outer margin of radius at middle and beyond; embolium rather uniformly fusco-blackish; cuneus black, pale to reddish on base; clothed with short black hairs and intermixed with recumbent, somewhat sericeous pale pubescence. Membrane dark fuscous, somewhat paler on middle but conspurcate with coalescing spots of fuscous, a small pale spot bordering apex of cuneus; veins fuscous, brachium pale at apical junction of smaller and larger areole.

Legs: Coxae pale to greenish, becoming fuscous near apices; femora chiefly blackish, marked with small pale spots, hind pair with an irregular incomplete subapical band, more conspicuous on anterior aspect, clothed with black hairs; tibiae pale to brownish black, dark at base and apically, spines and the spots at base black, also with irregular fuscous spots between; tarsi black.

Venter: Brownish black, moderately shining, pale to brownish pubescent; genital claspers distinctive of the species (fig. 135).

Holotype: Male, 24 July, 1915, Mt. Washington, alt. 2500 ft., New Hampshire (C. W. Johnson); author's collection. Paratypes: Male, 23 July, male, 30 July, male, 1 Aug., male, 7 Aug., 1921, Nordegg, ALBERTA (J. McDunnough).

*P. minutulus* Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 24, 1909.

*Female*: Length 5.1 mm., width 1.7 mm. Head: Width .83 mm., vertex .37 mm.; chiefly fusco-brownish, front clothed

with prominent yellowish pubescence. Rostrum, length 2.66 mm., reaching upon sixth abdominal segment, pale yellowish, blackish at apex.

Antennae: Segment i, length 1.28 mm., thickest near base and most slender just before apex, beset on inner and dorsal surface with several prominent pale spines, reddish to fuscous but with several irregular pale glabrous spots; ii, 2.43 mm., yellowish brown, fuscous at apex and next to the pale annulus at base; iii, 1.6 mm., yellowish to dusky, pale at base and becoming darker apically; iv, 1.47 mm., pale fuscous.

Pronotum: Length .74 mm., width at base 1.36 mm.; testaceous to fuscous, basal margin of disk pale but the submargin with dark fuscous bordering the pale; propleura chiefly pale, with a brownish black ray across lower half of coxal cleft which extends to basal margin; clothed with short black hairs and interspersed between with pale sericeous pubescence. Scutellum testaceous to dusky, with a small fuscous dot each side on margin near apex. Sternum and pleura testaceous to fuscous; ostiolar peritreme pale but becoming fuscous above.

Hemelytra: Embolar margins very slightly arcuate; clavus pale to fuscous, paler bordering scutellum and on claval suture; embolium fuscous but with pale irrorations; corium fuscous, irregularly pale bordering embolium, tinged with brownish on basal half, anal ridge pale; pubescence similar to that of pronotum but the pale sericeous hairs grouped in places to form white spots. Cuneus pale translucent, reddish to black on apex and with black spot at base and middle of membrane margin. Membrane conspurcate with fuscous, a paler spot near apex of cuneus and a second one on margin slightly beyond, veins reddish except that separating areoles.

Legs: Coxae pale, a reddish spot near base of lateral aspect; femora brownish black, chiefly pale on basal one-third and the blackish area irrorate with pale spots, also with a fairly distinct subapical pale band, pale irrorations largest on dorsal aspect but very small beyond the subapical pale band; hind tibiae pale, blackish on basal one-fifth, also with a fuscous band at middle; front tibiae fuscous, with three pale annuli which leave base and apex dark; intermediate tibiae scarcely fuscous at apex, with a narrow fuscous band somewhat before apex, a broader one at middle, and rather broadly fuscous or reddish near base but marked with pale spots; tarsi pale, apices fuscous, basal segment dusky.

Venter: Testaceous to reddish and fuscous, more fuscous on vagina exterior and ventrally on genital segments.

*Male*: Length 5 mm., width 1.55 mm.; very similar to the female but more slender; genital claspers distinctive.

Allotype: Female, 9 Aug., 1919, Cold Spring Harbor, N. Y. (H. M. Parshley); author's collection.

East River, 8 Aug., 7 Sept., 1910 (C. R. E.).

**P. antennalis** Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 32, 1909.

*Male*: Length 5.1 mm., width 1.6 mm. Head: Width .90 mm., vertex .42 mm.; testaceous to brownish black, tylus white, the middle third blackish. Antennae: Segment i, length 1.28 mm., brownish black, inner surface marked with four or five pale spots; ii, 2.56 mm., black, with a narrow pale annulus somewhat removed from base and a second broader band at slightly beyond middle; iii, 1.66 mm., fusco-brownish, pale at base; iv, 1.44 mm., fuscous. Pronotum: Length .79 mm., width at base 1.43 mm., testaceous to brownish, becoming black bordering the sinuately pale basal margin; basal submargin with two callus spots each side of middle; propleura blackish, a pale ray across top of coxal cleft. Scutellum testaceous to fuscous, with a slender nearly obsolete pale median line.

Hemelytra: Testaceous to fuscous, clothed with yellowish, black, and white pubescence; embolium with a callous black spot at apex, also blackish at middle but broken by pale marks; corium darker bordering clavus and on spot at middle along outer margin; cuneus reddish to blackish along outer margin and apex, with a black tuft of hairs at middle of inner margin and a second one near inner basal angle. Membrane rather densely conspurcate with fuscous, more uniformly fuscous apically and at base, somewhat pale near apex of cuneus but invaded by fuscous spots, veins fuscous.

Legs: Coxae white, fusco-reddish laterally at base; femora black, pale at base, hind pair spotted with pale on ventral aspect, a rather distinct subapical pale band on dorsal aspect, front pair largely pale, with a longitudinal blackish bar on posterior aspect and a shorter but similar bar on apical half of anterior face; front tibiae reddish to black, with a pale annulus at middle of apical half, a narrower one near middle of basal half, and a third nearly obsolete pale annulus just below knee; intermediate tibiae chiefly pale but marked with dark reddish, hind pair pale but more or less darkened with blackish; tarsi fuscous. Venter: Blackish, sides irregularly tinged with reddish; genital segment with a broad erect tubercle above base of left clasper, somewhat notched at top, also a small tubercle above base of right clasper, claspers distinctive of the species.

*Female*: Length 6.2 mm., width 1.9 mm.; more robust than the male but very similar in coloration. Antennae: Segment i, length 1.64 mm.; ii, 3.4 mm.; iii, 2.3 mm.; iv, 1.7 mm. Pronotum: Length .86 mm., width at base 1.46 mm.

Massachusetts, New Jersey, New York.

**Phytocoris davis** Knight, new species.

*Female*: Length 6.3 mm., width 2 mm. Head: Width 1.06 mm., vertex .46 mm., pale testaceous or white, with a black band extending across front between bases of antennae and touching

base of tylus; a line behind lower margin of eye and a small mark just above base of antenna, black; clothed with pale pubescence, front with a few blackish hairs intermixed. Rostrum, length 3.2 mm., attaining base of ovipositor, pale, blackish at apex.

Antennae: Segment i, length 1.61 mm., black, dorsal aspect with large spot on middle, small one near apex, and two or three small ones near base, white, beset with several white and dusky setae; ii, 3.14 mm., black, with broad pale band at base and one on middle; iii, 1.86 mm., blackish, pale at base and for a space beginning at middle; iv, 1.26 mm., fuscous.

Pronotum: Length .91 mm., width 1.54 mm.; basal margin of disk nearly as in *antennalis*, lateral margins broadly black, central area of disk, calli except outer margins, and collar except spot on sides, pale testaceous; disk clothed with white sericeous pubescence and intermixed with short black hairs; propleura pale, bordering dorsal margin, a line across lower margin of coxal cleft and extending to basal margin, black; xyphus pale. Scutellum pale testaceous, somewhat darkened with fuscous, an obsolete pale median line is apparent, clothed with pale sericeous pubescence and with short black hairs intermixed. Sternum blackish, pale along median line, pleura blackish, ostiolar peritreme pale.

Hemelytra: Embolar margins slightly arcuate; clothed with pale sericeous pubescence and intermixed with short black hairs; pale testaceous and darkened with fuscous and black; embolium blackish, interrupted with large pale spots; corium blackish on inner apical angle, distinctly pale at outer apical angle, radius indicated by blackish on apical half; clavus becoming fuscous on disk; cuneus pale, apex and spot at middle of inner margin black, clothed with short black hairs. Membrane pale, rather thickly and uniformly conspurcate with fuscous, a small nearly clear spot at apex of cuneus and a second one at margin slightly beyond; veins pale, that between areoles fuscous.

Legs: Pale, femora irregularly marked with large black spots on apical half, hind femora with one or two large black marks on dorsal surface just short of middle; front tibiae with band at apex, a narrower one at middle, and a smaller one at middle of basal half, black; intermediate tibiae narrowly fuscous at apex, band at middle, one at middle of basal half, and a third at slightly beyond middle of apical half, black; hind tibiae pale, irregularly darkened with fuscous, spines yellowish; tarsi pale, apex and base becoming fuscous.

Venter: Pale to nearly white, a broad band along dorsal margin, apical segment and vagina exterior, black; clothed with pale to yellowish pubescence.

Holotype: Female, 23 July, Lakehurst, N. J. (Wm. T. Davis); author's collection. Paratype: Female, 29 July, 1912, Central Park, Long Island, N. Y. (Wm. T. Davis).

Named in honor of the collector, Mr. Wm. T. Davis.

**\*P. conspurcatus Knight.**

Bull. Brook. Ent. Soc., xv, 61, 1920.

*Male*: Length 5.9 mm., width 2.1 mm. Distinguished by the dark conspurcate membrane and by the pale band at middle of antennal segments ii and iii; dorsum thickly clothed with black deciduous scale-like hairs and intermixed with small patches of white tomentum.

Head: Width 1.06 mm., vertex .34 mm., infuscated similarly to *eximius*. Rostrum, length 2.6 mm., attaining base of genital segment. Antennae: Segment i, length 1.2 mm., black, irregularly irrorate with white, beset with from fourteen to sixteen pale setae; ii, 2.5 mm., black, annulated at base with pale, a second pale band beginning at middle and covering a space of .3 mm. on base of apical half; iii, 1.48 mm., pale at base and again at middle; iv, 1.11 mm., black.

Pronotum: Length 1.54 mm., width at base 1.7 mm.; form and coloration very similar to *eximius*, but differs by the presence of black scale-like hairs; scutellum thickly covered with white tomentum.

Hemelytra: Rather uniformly darkened, a pale triangular spot at tip of corium bordering the cuneus; thickly clothed with black scale-like hairs and intermixed with small patches of white tomentum. Membrane thickly conspurcate with dark fuscous, cubitus pale at apex of larger areole, conspurcate spots more sparsely placed near apex of cells.

Legs: Marked very similarly to those of *eximius*, the pale band near apex of hind femora more or less interrupted on under side. Venter: Dark fuscous to blackish, more or less pale on under side at base; genital claspers and the long tubercle above base of left clasper (fig. 149: 16), distinctive of the species.

*Female*: Very similar to the male in size and coloration.

This is a predaceous, bark-inhabiting species which the writer has taken on the boles of Linden (*Tilia*), Pear (*Pyrus*), and Maple (*Acer*); frequently attracted to lights.

Hartford, 12 Sept., 1907 (W. E. B.); Wallingford, 3 Aug. (D. J. C.).

**\*P. sulcatus Knight.**

Bull. Brook. Ent. Soc., xv, 64, 1920.

*Male*: Length 6 mm., width 1.8 mm. In form very similar to *fumatus* but smaller; pronotum more distinctly sulcate at sides and immediately behind the calli; pale annulations more distinct at base and middle of segment ii; dorsum distinctly paler, outer half of clavus and inner apical angles of corium blackish; femora broadly pale at base, irrorate with large pale spots on apical half. Genital claspers, flagellum, and the large thick tubercle above base of left clasper (fig. 149: 15), distinctive of the species.

*Female*: Very similar to the male in coloration, but in form more robust and the embolar margins more distinctly arcuated.



Occurs on the bark of Linden (*Tilia*), and on bur oak (*Quercus macrocarpa*).

Branford, 22 Aug., 1904 (H. W. W.).

***P. vittatus* Reuter.**

Acta Soc. Sci. Fenn., xxxvi, No. 2, 28, 1909.

*Female*: Length 7.3 mm., width 2.2 mm. Head: Width 1.08 mm., vertex .46 mm.; clothed with long pale pubescence, front and vertex also bearing white sericeous, almost scale-like hairs; pale testaceous, front obliquely marked with more or less interrupted brown lines, geminate mark on base of tylus, transversely but irregularly across middle of tylus, basal margin of jugum, dorsal margin of lorum, dorsal margin of buccula, and line behind lower half of eye, reddish brown to fuscous; lora prominent, facial angle equal to a right angle. Rostrum, length 3.3 mm., reaching upon fifth abdominal segment, pale to yellowish, a reddish streak on basal segment, last two segments fuscous to piceous.

Antennae: Segment i, length 1.73 mm., fusco-reddish, dorsal surface with from ten to twelve white glabrous spots, beset with prominent white bristles which in length exceed thickness of segment, the dark areas clothed with recumbent black hairs, thickest near base, more slender just before apex; ii, 2.4 mm., slender, fuscous, a prominent pale spot on dorsal surface next to base, a much smaller one slightly beyond, a moderately broad pale or yellowish band on middle but its margins not sharply defined, the fine pubescence taking color of segment beneath; iii, 1.77 mm., uniformly dark fuscous, with pale annulus at base; iv, missing.

Pronotum: Length 1 mm., width at base 1.77 mm.; testaceous to grayish, lateral margins of disk becoming fuscous, a sinuate interrupted black line forming next to slender pale margin; clothed with short stiff black hairs and between with white sericeous scale-like pubescence, distinctly thicker along median line, bristle-like hairs on collar white; propleura fuscous, lower margins and xyphus white. Scutellum fuscous to black, irregularly on median line of apical half, basal angles, and along lateral margins, somewhat pale; mesoscutum fuscous to black, clothed like the scutellum with white sericeous scale-like hairs and intermixed with more erect dark hairs. Sternum and pleura fuscous, lower margin of epimeron and ostiolar peritreme white.

Hemelytra: Embolar margins only very slightly arcuate on middle; thickly clothed with sericeous scale-like white pubescence, most abundant bordering claval suture, and interspersed with more erect fuscous to black hairs; clavus fuscous to black, more nearly black on apical half, somewhat paler bordering commissure except apically; corium testaceous to fuscous, a distinctive longitudinal black stripe on apical half of mesocorium, exocorium nearly pale, radial vein outlined with blackish but interrupted to form spots

on apical half; embolium pale testaceous, blackish at apex, irregularly darkened on apical half; cuneus pale fuscous, outer margin pale, apex and inner margin becoming black. Membrane uniformly dark fusco-brownish, irregularly conspurcate with white, a slightly larger pale spot on margin near apex of cuneus, veins fusco-brownish.

Legs: Coxae pale yellowish, lateral aspect showing some reddish brown, posterior pair with more fuscous; front femora chiefly pale, posterior face with two longitudinal fusco-reddish lines which are broken on margins by pale irrorations, anterior aspect with longitudinal pale line separating blackish color, apical one-fifth nearly black but with pale spots; intermediate femora more broadly blackish on apical half; hind femora chiefly blackish, pale at base except on antero-ventral aspect, irrorate with small pale spots, three or four slightly larger spots on dorsal aspect, about three white spots joining to form an oblique mark near middle of apical half, pubescence and spines white; tibiae pale and irregularly marked with reddish and fuscous, front pair nearly black, with pale band at middle of apical half and one at middle of basal half, with two or three pale spots just below knee, spines white; tarsi fuscous to black, slightly paler on middle.

Venter: Reddish to fuscous, more nearly black on vagina exterior and genital segments, irregularly marked with pale, chiefly reddish and pale on ventral aspect anterior to base of ovipositor; pale to yellowish pubescent.

Described from the type which is in the U. S. National Museum: Female, 12 Aug., 1904, Lake Placid, N. Y. (Van Duzee).

Thus far the writer has seen only the type specimen, and judging by the amount of material handled this species must be very limited in distribution.

### ***P. tuberculatus* Knight.**

Bull. Brook. Ent. Soc., xv, 64, pl. 1, fig. 7, 1920.

*Male*: Length 6.5 mm., width 2.1 mm. Very similar to *fumatus*, especially in the white coloration on lower half of head. Antennae: Segment i, length 1.42 mm., equal to the distance from base of pronotum to a line drawn through the middle of eyes, and in this respect nearly identical with *fumatus*. Distinguished by having all the femora black, posterior pair with an oblique pale band near apex, and adjacent to this with a few small pale freckles as in *corticivivens*. Genital claspers, flagellum, a long tubercle above base of left clasper and a shorter one above the right clasper, distinctive of the species (fig. 149: 7).

*Female*: Very similar to the male but slightly more robust, frequently lighter colored.

New York, Michigan, North Carolina.

**\*P. corticevivens** Knight.

Bull. Brook. Ent. Soc., xv, 63, pl. 1, fig. 6, 1920.

*Male*: Length 6.6 mm., width 2.3 mm. Very similar to *fumatus*, differs in having the lower half of head black except for a small spot at base of lora. Femora black, narrowly pale at base, with a few small pale freckles near apices, the hind pair with a distinct white oblique band just before apex which is broader and more distinct on the anterior and ventral aspects. Genital claspers, flagellum, and a tubercle above base of each clasper (fig. 149: 6), distinctive of the species.

*Female*: Very similar to the male but slightly more robust, frequently lighter colored.

Occurs on the bark of maple trees (*Acer saccharum*).

Lyme, 4 July (H. B. K.).

**P. fumatus** Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 25, 1909.

*Male*: Length 7 mm., width 2.3 mm. Head: Width 1.17 mm., vertex .40 mm.; vertex with large alutaceous spot each side of median line, a pair of similar but smaller triangular spots at base of frons; front obliquely striate each side of median line with five blackish lines, transversely black between bases of antennae; lower half of face white, base of tylus, base of jugum, and spot on dorsal margin at base of lorum, black, a somewhat interrupted reddish band across middle of tylus. Rostrum, length 4.2 mm., attaining base of genital segment, pale, brownish on apical segment.

Antennae: Segment i, length 1.57 mm., equal to the distance between base of pronotum and a line drawn through eyes at a point slightly before middle, blackish, dorsal aspect marked with pale spots, the two largest spots on apical half; ii, 3.1 mm., brownish black, pale at base of dorsal aspect, a nearly obsolete yellowish spot on middle as seen from dorsal aspect; iii, 1.79 mm., blackish, pale at base for space of .17 mm.; iv, 1.3 mm., blackish.

Pronotum: Embolar margins only very slightly arcuate; fuscous to blackish, a large translucent spot at apex of exocorium, embolium irregularly translucent and darkened with fuscous; cuneus scarcely paler at base, a black tuft of hairs on inner margin near base and a similar tuft at apex of endocorium; pubescence blackish, intermixed with pale sericeous pubescence. Membrane pale, thickly and rather uniformly conspurcate with fusco-brownish; veins dark, pale at apex of larger areole.

Legs: Dark brownish black, coxae except spot near base, and trochanters, pale; femora irrorate with small pale spots, a slightly larger pale spot on anterior aspect near apex but hardly suggestive of a subapical band; front and middle tibiae pale on middle and with rather distinct pale band at middle of apical half; tarsi fuscous.

Venter: Black, yellowish pubescent; genital segment and claspers distinctive (fig. 149: 8).

*Female*: Length 7.6 mm., width 2.6 mm.; larger and more robust than the male, very similar in coloration but the dorsum lighter colored; antennal segment i longer, equal to distance between basal margin of pronotum and a line drawn through front margins of eyes.

Massachusetts, Long Island, N. Y.

***P. dimidiatus* Kirschbaum.**

*Phytocoris dimidiatus* Kirschbaum, Jahrb. Ver. Nat. Herz. Nassau, x, 199, 282, 1855; (Sep.) Caps. v. Wiesb., 39, 122, 1855.

Reuter, Hem. Gymn. Eur., v, 265, 1896.

*Phytocoris dubius* Douglas and Scott, Brit. Hem. Het., 305, 1865.

*Male*: Length 6.4 mm., width 2.3 mm. Head: Width 1.08 mm., vertex .40 mm.; testaceous and marked with brownish above, front with five oblique brownish lines each side of median line; tylus pale, a transverse reddish to black band across middle which has its lower margin in line with lower margins of juga; pale about base of antenna, a large black spot on base of juga, lora reddish black, pale apically except along margins; bucculae dark, gula white. Rostrum, length 2.8 mm., just attaining base of fifth abdominal segment, pale, brownish on apical segment.

Antennae: Segment i, length 1.32 mm., brownish black, nearly pale beneath, dorsal aspect with eleven or twelve irregular white glabrous spots, clothed with short black hairs and beset with about one pale or black bristle for each of the white spots; ii, 2.57 mm., blackish, base and annulus at slightly beyond middle, pale; iii, 1.63 mm., black, pale at base; iv, 1.08 mm., blackish.

Pronotum: Length 1.04 mm., width at base 1.08 mm.; disk testaceous to fuscous and with a tinge of greenish, narrow lateral margins, median line behind calli, irregularly along subbasal margin, blackish; calli yellowish to brownish, with one or two dark marks on disk; clothed with yellowish and blackish pubescence intermixed; propleura black, beneath a line drawn through lower margin of coxal cleft, white. Scutellum testaceous to blackish, median line pale apically, blackish bordering the pale. Sternum and pleura blackish, ostiolar peritreme white.

Hemelytra: Embolar margins very slightly arcuate; blackish, a triangular pale area at apex of cuneus; a somewhat paler area at middle and at near base of corium, inner margins of clavus and irregularly along claval vein slightly paler; embolium pale to yellowish and marked with blackish; clothed with yellowish and blackish pubescence intermixed. Cuneus yellowish, irregularly darkened with fuscous, apex and one or two spots along inner margin black, outer margin becoming reddish. Membrane pale, irregularly and rather thickly conspurcate with blackish, larger areole with basal one-fourth and narrowly bordering the black radius, uniformly blackish; cubitus pale along apices of areoles, also a small pale spot bordering apex of cuneus.

Legs: Coxae pale, a fuscous spot near base of lateral aspect; hind femora black, marked with large and small pale spots, with an oblique subapical pale band, basal one-fourth of anterior and posterior aspects pale; front and intermediate femora blackish but with pale spots largely confluent so that the black color is separated into streaks and spots, the blackish color most prominent dorsally on apical half; front tibiae black, triannulate with pale, basal band below knee less conspicuous; intermediate tibiae black, a black band at middle separating two prominent pale bands, the third pale band at apex but with tip of tibia fuscous; hind tibiae blackish, irregularly marked with small nearly glabrous pale spots, the pale spots confluent for a space at middle of basal half; tarsi fuscous, paler on second segment.

Venter: Black, somewhat yellowish along ventral median line; genital segment without tubercles, claspers distinctive (fig. 136).

Described from a single specimen, male, 27 Aug., 1917, Kentville, Nova Scotia (W. H. Brittain).

*Key to Species of Phytocoris, Group II.*

In this group accurate determinations can be expected only when making use of the male genital claspers. Once the male is correctly determined, females of the same species can usually be recognized by the general similarity of coloration, differences which are apparent yet very difficult to formulate in a key. For determining fully mature and well preserved specimens the following key should prove useful but the male genital claspers should be examined when possible.

1. Corium with distinct black or dark fuscous mark across apical area, extending obliquely from radius across to inner apical angle of corium, the dark mark never broken with paler irrorations ... 2  
Corium without distinct black mark across apical area, sometimes fuscous but the dark color broken by paler irrorations, but if not, then the black color on radius distinctly darker than the oblique infuscation ..... 10
2. Pronotal disk uniformly deep black, narrow basal margin pale; scutellum yellowish, with an oblique black mark each side of median line which begins at middle of disk and extends to margin at a point barely beyond middle ..... (p. 636) *nigricollis* n. sp.  
Pronotal disk pale grayish to blackish, always paler on middle and never deep black ..... 3
3. Scutellum with distinct black mark on each side of apical half which extends from lateral margin obliquely cephalad to near middle of disk ..... 4  
Scutellum with black spot at margin each side of apical half, but scarcely longer than broad, at most not extending more than half way to middle of disk ..... 7
4. Pale color on lower margins of propleura not extending upon sides of sternum ..... 5  
Pale color on lower margins of propleura extending upon sides of sternum; hind femora black except at base, pale irrorations small, the largest spot not wider than the narrow pale band at slightly beyond middle of apical half ..... (p. 639) *husseyi* n. sp.

5. (Female) Hind femora with large irregular pale spots on anterior face, spots connected by a longitudinal pale bar although not attaining the subapical pale band; large, length 7.3-7.6 mm. .... (p. 638) *onustus*
- (Female) Hind femora with small spots, without distinct longitudinal pale bar on anterior face ..... 6
6. Membrane with infuscation on central area tending to separate into small specks; front of head transversely striate with black lines each side of median line ..... (p. 634) *neglectus*  
Membrane more uniformly infuscated, infuscation not separating into small specks; front of head not distinctly striate with black even when the hemelytra are very dark, although reddish lines usually evident ..... (p. 638) *spicatus*
7. (3) Hind femora with distinct white band placed at slightly beyond middle of apical half, usually with large pale spots near middle 8  
Hind femora without distinct white band on apical half, pale spots usually rather small ..... 9
8. Antennal segment ii distinctly pale or yellowish on dorsal aspect, but darker on apex and next to pale annulus at base; scutellum and clavus clothed with yellowish hairs and intermixed with shorter sericeous white pubescence; membrane somewhat fuscous on middle ..... (p. 632) *eximius*  
Antennal segment ii black except at base, dorsal aspect not distinctly paler; scutellum and clavus clothed with black hairs and intermixed with prominent white sericeous pubescence (p. 640) *buenoi*
9. Corium with very heavy triangular black mark set obliquely across apex of corium; cuneus usually reddish ..... (p. 640) *erectus*  
Corium with light, almost interrupted fuscous mark set obliquely across apex of corium; cuneus rarely if ever reddish ..... (p. 634) *brevifurcatus*
10. (1) Corium not distinctly green ..... 11  
Corium distinctly greenish on apical half; antennal segment ii black but with pale annulus at base ..... (p. 640) *penipecten*
11. Hemelytra more brownish than black, dark color on apical area of corium and on middle of clavus broken into small spots, pubescence chiefly golden brown ..... (p. 639) *salicis*  
Hemelytra sometimes brownish but the dark color not distinctly broken into small spots ..... 12
12. Front and vertex transversely marked with blackish lines ..... 13  
Front and vertex pale to yellowish, not distinctly marked with blackish, rarely with short red lines indicated near each eye; scutellum pale to yellowish, a small rounded brown to fuscous spot each side by margin at middle of apical half (p. 635) *angustulus*
13. Scutellum chiefly pale to grayish, but with black mark at each side on apical half ..... 14  
Scutellum chiefly brownish black, irregularly maculated with paler, median line slenderly pale but irregularly invaded with darker color ..... (p. 641) *obtectus*
14. Corium with a longitudinal pale area which extends upon base of cuneus without interruption by an oblique infuscation; a black line formed along radius but curving outward apically to the fracture ..... (p. 638) *lacunosus*  
Corium rather distinctly darkened with fuscous on apical half, scarcely showing paler by contrast with dark marks along radius (p. 638) *cortitectus*

# **P. eximius Reuter.**

Ofv. Kongl. Sv. Vet.-Akad. Forh., xxxvi, No. 9, 67, 1876.

Bull. Brook. Ent. Soc., xv, 51, 1920.

*Male*: Length 5.7 mm., width 2 mm. Head: Width .94 mm., vertex .35 mm.; yellowish, frequently tinged with reddish; geminate mark at base of tylus and apical half excluding a pale spot on each side opposite tips of lora, dorsal margin of lora, juga, bucculae, and a ray passing lower margin of eye, reddish brown to fuscous or black; front clothed with long pale hairs. Rostrum, length 2.4 mm., attaining basal margin of genital segment, yellowish, blackish toward the apex.

Antennae: Segment i, length 1.28 mm., yellowish, irregularly mottled with fuscous, bearing five or six long pale setae; ii, 2.77 mm., fuscous, pale at base for space of .17 mm., the infuscation distinctly paler on dorsal aspect of middle third and becoming darker toward each end; iii, 1.6 mm., dark fuscous, pale at base for space of .14 mm., and again very narrowly at apex; iv, 1.25 mm., blackish.

Pronotum: Length .91 mm., width at base 1.6 mm., anterior angles .57 mm., collar .64 mm.; lateral margins very slightly sulcate, gently rounded basally; disk moderately arched, an even contour maintained behind calli and at lateral margins; calli oval, slightly separated, delimited behind by an impressed margin, pale with one or two fuscous marks on outer half; disk testaceous to fuscous, central area frequently grayish green, paler anteriorly, narrow basal margin pale, sub-basal margin with six blackish points that frequently join; disk distinctly hairy, longest hairs at anterior angles, hairs taking the color of the surface where they arise; collar pale, marked with reddish each side of the median line, bearing several prominent pale hairs; propleura blackish, lower margins and mark across base of coxal cleft, pale. Scutellum testaceous, a pair of diverging black vittae just before apex, becoming paler toward the median line; mesoscutum moderately exposed, sloping abruptly downward at lateral angles; heavily clothed with a mixture of pale and yellowish pubescence. Sternum blackish, a pale ray on each side behind ventral margin of propleura; pleura fuscous, narrow margins of sclerites, basalar piece, and ostiolar peritreme, pale.

Hemelytra: Clothed with prominent yellowish pubescence and intermixed with groups of white deciduous tomentum, dark hairs arising from the dark markings; greenish gray to fuscous, corium with base, middle, a triangular spot just before cuneus, several spots on the embolium, paler and more or less translucent; tip of embolium, an oblique nearly triangular patch lying just inside of radius at apex of corium, bordering the claval suture except on basal one-third, fuscous to black; clavus more or less fuscous either side of claval vein and bordering the claval suture. Cuneus grayish translucent, the apex, a small point along the inner margin and a second near basal angle, black; the paler part usually showing some brownish or reddish coloration. Membrane fuscous, a

large pale area just beyond the smaller areole and the tip of cuneus, divided by a small fuscous spot which touches the margin; central area more or less invaded by paler, cubitus distinctly pale at apex of areoles.

Legs: Coxae and bases of femora pale; front and intermediate femora with a series of irregular reddish brown to fuscous marks; posterior femora blackish, forming the background for many large and small irrorations, the pale patches most numerous and broadly joined on the inner side, an irregular pale annulation a short space before apex and a second one nearer the middle but interrupted on the outside. Tibiae annulated with fuscous and pale; front pair banded with fuscous at apex, narrowly at knee, and twice between these points; intermediate pair with the apical band becoming pale, the whole apical half being more pale than fuscous; hind pair infuscated, irregularly spotted with pale, broadly pale on basal one-third, delimited by blackish on inner side at base and by a distinct annulation at middle; spines pale to brownish; tarsi fuscous, arolia erect and diverging at the apices.

Venter: Clothed with prominent yellowish hairs, infuscated, yellowish on ventral side except the genital segment which is narrowly pale along median line and frequently on the sides near base of claspers. Genital claspers and flagellum (fig. 149: 1) distinctive of the species.

*Female*: Length 5.7 mm., width 2.05 mm. Very similar to the male in coloration; imperfect or poorly colored specimens can never with certainty be distinguished from the females of closely related species.

Occurs on a number of plants in various situations; is largely if not wholly predaceous as are a number of closely related species in this group.

East River, 5 Aug., 1910 (C. R. E.); New Haven, 29 July, 1920 (M. P. Z.); Portland, 12 Aug., 1913 (B. H. W.).

#### ***P. brevifurcatus* Knight.**

Bull. Brook. Ent. Sci., xv, 53, 1920.

*Male*: Length 5.8 mm., width 2.14 mm. Very similar to *eximius* but without heavy oblique fuscous mark at apex of corium; second antennal segment darker fuscous on the middle third; head and pronotum distinctly grayish green on the paler parts; hind femora with smaller irrorations, not distinctly banded with pale; genital claspers and flagellum (fig. 149: 2) distinctive of the species.

New York.

#### ***P. neglectus* Knight.**

Bull. Brook. Ent. Sci., xv, 54, 1920.

*Male*: Length 6.2 mm., width 2.2 mm. Resembles *eximius* but with antennal segment ii uniformly blackish except for the whitish annulation at base; corium and clavus usually more broadly black-



ish; apical band on intermediate tibiae white; infuscation at middle of membrane tending to separate into small specks; genital claspers and flagellum (fig. 149: 3) distinctive of the species.

Apparently there are two generations of this species in one season. The writer took specimens most frequently on the bark of apple trees where both adults and nymphs fed on Psocids. The species was also found on the bark of other trees and it is probably predaceous on most soft-bodied insects living in such situations.

Maine, Massachusetts, New York.

***P. angustulus* Reuter.**

Acta Soc. Sci. Fenn., xxxvi, No. 2, 29, 1909.

*Male*: Length 6.2 mm., width 2.1 mm. Head: width .96 mm., vertex .34 mm.; yellowish, bucculae and large spot at base of lorum blackish, tylus nearly uniformly yellowish. Rostrum, length 2.6 mm., attaining middle of sixth ventral segment, yellowish, blackish apically.

Antennae: Segment i, length 1.26 mm., chiefly pale yellowish, fuscous reticulations apparent and separating the more or less confluent pale spots; ii, 2.86 mm., fuscous, more yellowish on dorsal aspect, with pale annulus at base; iii, 1.5 mm., blackish, narrowly yellowish at base; iv, 1.1 mm., blackish.

Pronotum: Length 1 mm., width at base 1.66 mm.; fusco-grayish, calli and collar yellowish, disk becoming more nearly

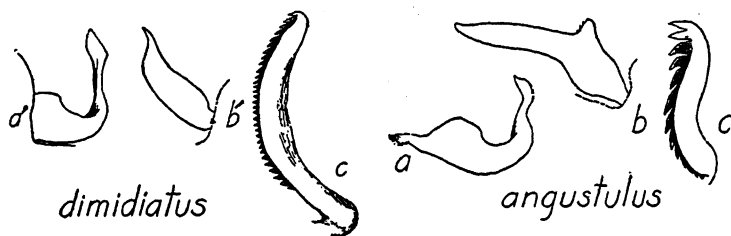


FIG. 136. *Phytocoris dimidiatus* Kirsch.,—male genital claspers, (a) left clasper, lateral aspect with outline of genital segment added, (b) right clasper, lateral aspect with outline of genital segment added, (c) flagellum. Greatly enlarged. Drawing by Dr. H. H. Knight.

FIG. 137. *Phytocoris angustulus* Reuter, —male genital claspers, (a) left clasper, lateral aspect, (b) right clasper, lateral aspect, (c) flagellum. Greatly enlarged. Drawing by Dr. H. H. Knight.

fuscous laterally, basal submargin with two black marks each side of median line, slender basal margin yellowish; clothed with blackish and yellowish pubescent hairs, sparsely intermixed with white sericeous pubescence, thicker along median line; propleura blackish, lower margin and spot across top of coxal cleft pale.

Scutellum yellowish, a small brownish spot each side along margin of apical half. Sternum blackish, median line and spot behind lower margin of propleura, yellowish; propleura yellowish to fuscous, ostiolar peritreme white.

Hemelytra: Embolar margins scarcely arcuate; pale to yellowish and darkened with fuscous; clothed with yellowish to blackish pubescence and intermixed with spots of white sericeous tomentose pubescence; a triangular pale translucent spot at apex of corium which is confluent with pale on cuneus, also with the pale spot on middle and one near base of corium. Cuneus pale, apical half reddish to blackish, a black spot at middle of inner margin, also a spot on corio-membrane margin. Membrane uniformly dark fuscous, a paler area bordering apex of cuneus and smaller areole, somewhat pale at slightly distad of this spot but not extending to margin.

Legs: Coxae pale yellowish; femora blackish, thickly conspurcate with small pale spots, more broadly paler near base, hind pair with a subapical oblique pale band formed by coalescing pale spots; tibiae fuscous and with pale, indistinctly banded, hind pair chiefly fuscous but with broad pale area at middle of basal half.

Venter: Blackish, more yellowish on genital segment; genital claspers distinctive (fig. 137).

*Female*: Length 6.1 mm., width 2.1 mm.; very similar to the male in form and coloration.

Collected by the writer on *Tsuga canadensis*.

New York, Vermont, Nova Scotia.

***Phytocoris nigricollis* Knight, new species.**

*Male*: Length 5.1 mm., width 1.77 mm. Head: Width .92 mm., vertex .28 mm.; yellow, a reddish or blackish mark behind dorsal margin of eye; apical half of tylus, dorsal margins of lora, lora except apically, bucculae, and spot beneath eye, black, gula pale. Rostrum (female) length 2.34 mm., extending upon fifth abdominal segment, yellowish, blackish apically.

Antennae: Segment i, length .86 mm., pale yellowish, black on dorsal aspect but broken by large and small yellowish irrorations, clothed with short black and pale hairs, a pale bristle arising from each yellowish spot but in length little exceeding thickness of segment; ii, 2.24 mm., black, with pale annulus at base, clothed with short pale to dusky pubescence; iii, 1.18 mm., black, pale at base; iv, .97 mm., black.

Pronotum: Length .86 mm., width at base 1.47 mm.; deep black, a pale spot between calli which extends upon collar, narrow basal margin of disk white, with sinuate margin bordering the black; lower pleural margin and small spot at top of coxal cleft white; disk clothed with rather prominent black hairs, those arising from pale areas are likewise pale, sparsely intermixed with sericeous tomentose pubescence which takes ground color, most prominent

between calli and near margins of disk; xyphus and collar beneath white. Scutellum yellow, with an oblique black mark on apical half each side of median line, middle of mesoscutum and extending slightly upon scutellum also black; yellowish pubescent, a few dusky hairs on disk, basal angles, median line, and largely on mesoscutum, clothed with sericeous white tomentum. Sternum and pleura black, slender margin just in front of middle coxae, spot at lower margin of epimeron, and the ostiolar peritreme white.

Hemelytra: Embolar margins very slightly arcuate; clavus pale yellowish, becoming fuscous at middle bordering claval suture; corium black, base, spot on middle, and triangular mark at apex bordering cuneus, pale; embolium black, base and three or four spots on middle third, pale; clothed with pale and black pubescence, intermixed with small tufts of white sericeous pubescence. Cuneus yellowish, apex and inner margin except near base, black. Membrane uniformly blackish, a small pale spot at apex of cuneus, cubitus at apex of larger areole white.

Legs: Coxae pale; femora black, irrorate with small and moderately large yellowish spots, bases pale, front pair with pale extending to middle of anterior aspect, extending in the same manner on dorso-posterior aspect of hind pair; hind tibiae black, a broad pale band at middle of basal half, also a pale spot on dorsal

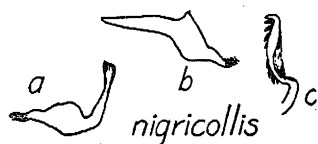


FIG. 138. *Phytocoris nigricollis* Knight,—male genital claspers, (a) left clasper, lateral aspect, (b) right clasper, lateral aspect, (c) flagellum. Greatly enlarged. Drawing by Dr. H. H. Knight.

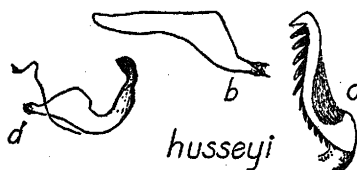


FIG. 139. *Phytocoris husseyi* Knight,—male genital claspers, (a) left clasper, lateral aspect with outline of genital segment added, (b) right clasper, lateral aspect, (c) flagellum. Greatly enlarged. Drawing by Dr. H. H. Knight.

aspect near knee, spines yellowish, usually a small yellowish spot at base of each; front and middle tibiae white, band at middle, apex, and middle of basal half, black; tarsi blackish.

Venter: Deep black, yellowish basally on ventral side, clothed with yellowish to brownish pubescence; genital claspers distinctive of the species (fig. 138).

*Female*: Length 5.1 mm., width 2 mm.; embolar margins slightly more arcuate than in the male; coloration very similar to male but more broadly pale on hemelytra. Head: Width .91 mm.,

vertex .34 mm. Antennae: Segment i, length 1.1 mm.; ii, 2.6 mm.; iii, 1.36 mm.; iv, 1 mm.

Holotype: Male, 7 Aug., 1918, Hampton, N. H. (S. Albert Shaw); author's collection. Allotype: Female, 14 July-5 Aug., 1912, Black Mountains, North Carolina (Beutenmuller); Cornell Univ. collection. The writer has also seen a third specimen which is in the United States National Museum collection.

**P. onustus** Van Duzee.

Proc. Calif. Acad. Sci., ser. 4, ix, 244, 1920.

Length male 7 mm., width 2.4 mm.; length female 7.4 mm., width 2.56 mm. Suggestive of *eximius* but larger and usually darker colored; distinguished in the key and by the genital claspers (fig. 149: 9).

The writer collected this species most frequently on the bark of hickory (*Carya*) trees situated in shaded humid surroundings.

Massachusetts, Maine, New York, Vermont.

**P. spicatus** Knight.

Bull. Brook. Ent. Soc., xv, 55, 1920.

*Male*: Length 6 mm., width 2 mm. Slightly larger than *eximius* and more broadly black; antennal segment ii uniformly black except for the white annulation at base; front largely black, transverse striae evident; hind femora as in *eximius* only darker, one distinct pale annulation just before apex; flagellum and right genital clasper distinctive of the species (fig. 149: 10).

*Female*: Length 6.8 mm., width 2.2 mm.; very similar to the male only slightly larger.

This species comes nearest to *coritictus* but is readily distinguished by the sharp basal spike on the right clasper and by the darker coloration; also approaches *onustus* but is smaller and more blackish.

Maine, Massachusetts, New York.

**P. cortitectus** Knight.

Bull. Brook. Ent. Soc., xv, 55, 1920.

*Male*: Length 6 mm., width 2 mm. Very similar to *eximius*; pale parts of hemelytra more translucent, infuscations paler; front of head transversely striate with fuscous each side of the median line; antennal segment ii more uniformly fuscous, but with a pale reflection apparent throughout the infuscation; genital claspers and flagellum distinctive of the species (fig. 149: 11).

*Female*: Very similar to the male but slightly more robust.

The writer took specimens only on the trunks of elm trees (*Ulmus*) where the species is admirably concealed as it crouches in crevices of the bark.

New Hampshire, New York.

**P. lacunosus** Knight.

Bull. Brook. Ent. Soc., xv, 56, 1920.

*Male*: Length 6.7 mm., width 2.2 mm. Very similar to *cortitectus* only larger; nearly the size of *onustus* but more slender and paler in color; corium with a longitudinal pale area which extends upon base of cuneus without interruption at the cubitus; flagellum and right genital clasper distinctive of the species (fig. 149: 4).

*Female*: Very similar to the male only slightly more robust.

Occurs on the bark of *Carpinus caroliniana*.

New York.

**\*P. salicis** Knight.

Bull. Brook. Ent. Soc., xv, 56, 1920.

*Male*: Length 6 mm., width 2.1 mm. Very similar to *eximius* but distinctly brownish above; fuscous coloration of the hemelytra interspersed with brownish maculations; antennal segment ii more distinctly pale fuscous, becoming dark only at apex and next to the pale basal annulation; membrane paler on the central area and with a median pale ray extending to apex; genital claspers and flagellum distinctive of the species (fig. 149: 13).

*Female*: Very similar to the male in size and coloration.

Breeds on willow, chiefly *Salix nigra*, where the species appears to be predaceous on soft-bodied insects living on that tree.

Branford, 15 July, 1904 (H. W. W.); Litchfield, 22 July, 1920 (P. G.).

**Phytocoris husseyi** Knight, new species.

*Male*: Length 5.1 mm., width 2 mm. Head: Width 1.04 mm., vertex .33 mm.; pale to yellowish, median line of front and two or three incomplete oblique lines at each side reddish to blackish; lower part of front, base of tylus, lower half of tylus except for small spot each side by lora, about base of antenna, basal half of juga, dorsal margin of lora, and bucculae, reddish to black, gula and areas between the black, white. Rostrum, length 2.26 mm., reaching upon fourth ventral segment, pale, apex blackish.

Antennae: Segment i, length 1.18 mm., deep black, dorsal aspect with two large and six or seven small white spots, setae pale to blackish; ii, 2.4 mm., black, pale at base, somewhat brownish at middle of dorsal aspect; iii, 1.41 mm., black, pale at base; iv, 1.2 mm., black.

Pronotum: Length .91 mm., width at base 1.6 mm.; nearly as in *erectus* but calli and between, more yellowish. Scutellum pale to yellowish, with heavy oblique black mark on apical half each side of median line, brownish color extending cephalad from the black marks. Sternum black, pale area extending behind lower white margin of propleura; pleura black, ventral margin of epimeron and the ostiolar peritreme white.

Hemelytra: Nearly as in *erectus* but with more black, disk of clavus blackish but broken by paler irrorations of brownish and fuscous; clothed with erect short blackish hairs and intermixed with tufts of white sericeous tomentose pubescence, more nearly like *buenoi* in this respect. Cuneus yellowish to dusky, apical half

fuscous to black but irrorate with paler spots, outer basal margin greenish; apex of mesocorium bordering inner basal angle of cuneus fuscous, with black spot on corio-membrane margin, the pale spot at apex of corium not extending upon cuneus. Membrane suggestive of *erectus* by having two fuscous areas each side on apical half, but differs by having central area fuscous as well as the basal area more broadly blackish.

Legs: Rather similar to those of *erectus* but differs in having a clearly defined, although narrow subapical pale annulus on hind femora.

Venter: Blackish, pale beneath but rather narrowly on genital segment; genital claspers (fig. 139) distinctive of the species, exhibiting a close relationship with *buenoi*.

Holotype: Male, 12 Aug., 1921, Mendon, Mercer County, Ohio (R. F. Hussey); author's collection. Named in honor of the collector, Mr. R. F. Hussey.

**\*P. buenoi Knight.**

Bull. Brook. Ent. Soc., xv, 57, 1920.

*Male*: Length 5.8 mm., width 2 mm. Resembles *eximius* but the colors of the dorsum are more in contrast; front and middle femora dark fuscous brown, closely and irregularly maculated with pale; black patch bordering the cubitus strongly contrasted with the pale spot which joins the base of cuneus, pale part of cuneus tinged with roseous; central area of membrane distinctly pale; genital claspers and flagellum (fig. 149: 14) distinctive of the species.

*Female*: Very similar to the male in size and coloration.

Occurs on Norway Spruce (*Picea*).

New Haven, 27 June, 1904 (W. E. B.).

**P. erectus Van Duzee.**

Proc. Calif. Acad. Sci., ser. 4, ix, 345, 1920.

*Male*: Length 5.4 mm., width 2 mm. Head: Width .94 mm., vertex .36 mm. Antennae: segment i, length 1.16 mm., more broadly pale than in *husseyi*; ii, 2.5 mm.; iii, 1.28 mm.; iv, 1.2 mm. Pronotum: Length .87 mm., width at base 1.56 mm.

Very similar to *husseyi* in size and coloration, the pale areas of dorsum more uniformly brownish, cuneus reddish, and hind femora without distinct subapical pale band. Genital claspers very distinctive (fig. 149: 5).

Maine, Massachusetts, New Hampshire, New York.

**\*P. penipecten Knight.**

Bull. Brook. Ent. Soc., xv, 58, 1920.

*Male*: Length 5.1 mm., width 1.9 mm. Very similar to *eximius*; antennal segment ii uniformly infuscated except the pale annulus at base; apical half of corium and bordering the claval vein, distinctly olive green; flagellum and genital claspers (fig. 149: 12) distinctive of the species.

*Female*: Length 5.5 mm., width 2 mm. Very similar to the male in coloration but in form slightly more robust.

East River, Sept., 1910 (C. R. E.); New Canaan, 14 Sept., 1905 (W. E. B.).

*P. obtectus* Knight.

Bull. Brook. Ent. Soc., xv, 58, 1920.

*Male*: Length 5.5 mm., width 1.85 mm. Very similar to *eximius* but 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 chiefly brownish black, irregularly maculated with paler, median line slenderly pale but irregularly invaded with darker color; genital claspers and flagellum (fig. 149: 21) distinctive of the species.

*Female*: Very similar to the male in size and coloration.

New York.

*Key to Species of Phytocoris, Group III.*

1. Hemelytra rather uniformly rufescent, embolium and cuneus yellowish translucent ..... *mundus* 2
2. Hemelytra not uniformly rufescent ..... 2
3. Hemelytra yellowish to fulvous, clavus not darker than corium ..... 3
4. Hemelytra more nearly fuscous than yellowish, irregularly tinged with reddish, clavus darker than outer margin of corium ..... 5
5. Femora with paler maculae very small, nearly obsolete; pale yellowish, darkened with fulvous on outer half of clavus and inner half of corium; cuneus yellowish translucent, reddish yellow apically ..... *fulvus*
6. Femora with pale maculae distinct, but if not, then with inner half of cuneus distinctly roseous ..... 4
4. Hemelytra uniformly yellowish brown translucent, sometimes tinged with reddish at base of cuneus; scutellum uniformly yellowish to reddish, never paler on median line or apex ..... *uniformis* n. sp.
5. Hemelytra fulvous to reddish on inner half of corium, inner half of cuneus roseous; scutellum with fulvous each side of middle, median line and apex distinctly paler ..... *diversus*
5. Hind femora fusco-reddish, with distinct small white irrorationes but never forming a distinct subapical band ..... *conspersipes*
6. Hind femora fuscous, with small yellowish maculae but dorsal surface with a rather broad subapical band or transverse pale spot ..... *pinicola*

*P. mundus* Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 18, 1909.

Length 4.2 mm., width 1.6 mm. Hemelytra and scutellum rather uniformly rufescent, embolium and cuneus yellowish translucent; membrane uniformly pale fumate, veins yellowish.

*Male*: Head: Width .91 mm., vertex .37 mm. Antennae: Segment i, length .61 mm., uniformly yellowish, dusky pubescent and with seven or eight setae; ii, 1.7 mm., blackish, more yellowish at

base; iii, .98 mm., black; iv, 84 mm., black. Genital claspers (fig. 149: 22) distinctive of the species.

Breeds on *Pinus virginiana*.

New Jersey, Maryland, District of Columbia.

**P. fulvus** Knight.

Bull. Brook. Ent. Soc., xv, 59, 1920.

*Male*: Length 6 mm., width 2 mm. Head: Width 1.08 mm., vertex .34 mm. Antennae: segment i, length .88 mm., yellow but with paler spots apparent, dusky pubescent, setae yellowish to dusky; ii, 2.5 mm., yellowish, infuscated apically; iii, 1.25 mm., black, yellowish at base; iv, .93 mm., black.

Suggestive of *mundus* but larger, more elongate and paler in color; pale yellowish, darkened with fulvous on outer half of clavus and inner half of corium; apical half of femora perceptibly darkened but small pale irrorations are visible; membrane pale, uniformly tinged with fumate, the veins fulvous; genital claspers and flagellum (fig. 149: 23) distinctive of the species.

*Female*: Very similar to the male in size and coloration.

Breeds on *Pinus strobus*.

Maine, New York.

**P. pinicola** Knight.

Bull. Brook. Ent. Soc., xv, 59, 1920.

*Male*: Length 5.2 mm., width 1.8 mm. Head: Width .96 mm., vertex .36 mm. Antennae: Segment i, length .54 mm., pale yellowish to dusky, dorsal surface with pale glabrous spots, two brownish black setae set on margin of each glabrous spot; ii, 1.97 mm., blackish, paler beneath; iii, .92 mm., blackish, narrowly pale at base; iv, .50 mm., blackish.

In coloration most suggestive of *conspersipes* but the genital structures show it to be more closely related to *mundus*; more slender than *conspersipes*, spots on femora and tibiae less distinct, usually orange-yellow; genital claspers and flagellum distinctive of the species (fig. 149: 17).

*Female*: Similar to the male in coloration, but shorter and more robust in form.

Breeds on *Pinus resinosa* and *P. silvestris*.

Records: MASSACHUSETTS—15 Sept., 1914 Blue Hills (H. M. Parshley); 15 July-6 Aug., 1917, Woods Hole (C. E. Olsen). The type specimens came from New York.

**P. diversus** Knight.

Bull. Brook. Ent. Soc., xv, 60, 1920.

*Male*: Length 5 mm., width 1.7 mm. Head: Width .97 mm., vertex .37 mm. Antennae: Segment i, length .71 mm., greenish, darkened with fusco-brownish, irrorate with paler on inner side, beset with nine or ten dark bristles; ii, 2.05 mm., infuscated, paler on basal half; iii, 1.05 mm., blackish; iv, .85 mm., blackish.



Structurally, nearly identical with *consersipes* but form more slender, length of antennal segment ii greater as compared with width of head; general aspect more nearly that of *fulvus*, the fulvous coloration more distinct on inner apical half of corium and on cuneus; head, pronotum, and ventral parts greenish, pronotum basally, sides of tylus, dorsal margins of juga and lora, base of head, indistinct transverse striae on front, sternum and sides of venter, tinged with reddish brown; femora except basally and tibiae, fusco-brownish, irrorate with pale, spots much enlarged on dorsal aspect of hind femora. Genital claspers and flagellum (fig. 149: 20) nearly identical with those of *consersipes*.

*Female*: Very similar to the male in size and coloration.

Breeds on *Pinus strobus*.

Maine, Massachusetts, New Hampshire, New York.

**P. consersipes** Reuter.

Acta Soc. Sci. Fenn., xxxvi, No. 2, 22, 1909.

*Male*: Length 4.7 mm., width 1.8 mm. Head: Width 1.03 mm., vertex .37 mm. Antennae: Segment i, length .60 mm., fusco-brownish, irrorate with pale, setae fuscous; ii, 1.86 mm., black, narrowly pale at base; iii, .89 mm., black; iv, .82 mm., black. Pronotum: Length .82 mm., width at base 1.5 mm. Genital claspers distinctive of the species (fig. 149: 19).

Breeds on *Pinus virginiana*.

New Jersey, Maryland, District of Columbia.

**Phytocoris uniformis** Knight, new species.

Suggestive of a pale specimen of *pinicola* but differs in the pubescence on the dorsum; clothed with recumbent golden yellow pubescence and intermixed with tufts of white sericeous tomentum, the more erect hairs brownish while in *pinicola* black and very prominent.

*Male*: Length 5.2 mm., width 1.8 mm. Head: Width 1.03 mm., vertex .37 mm.; yellowish with a tinge of brown. Rostrum, length 1.9 mm., yellowish brown, blackish apically.

Antennae: Segment i, length .83 mm., brownish yellow, with nearly obsolete paler irrorations above, darkest specimens reticulate with reddish, setae yellowish to dusky, in length scarcely exceeding thickness of segment; ii, 2 mm., blackish, more yellowish basally; apical segments missing.

Pronotum: Length .77 mm., width at base 1.43 mm.; uniformly brownish yellow, clothed with golden to yellowish pubescent hairs, intermixed with white sericeous tomentum. Scutellum more deeply colored than pronotum but with pubescence similar. Sternum and pleura yellowish with a tinge of fulvous, ostiolar peritreme scarcely paler.

Hemelytra: Embolar margins very slightly arcuate; uniformly yellowish brown translucent, sometimes tinged with reddish on

base of cuneus; pubescence described above. Membrane uniformly fumate, sometimes tinged with yellowish, veins scarcely darker.

Legs: Pale to yellowish, femora reddish brown and irrorate with pale, posterior pair with slightly larger subapical pale spot on dorsal surface; tibiae with small reddish spots or reticulations.

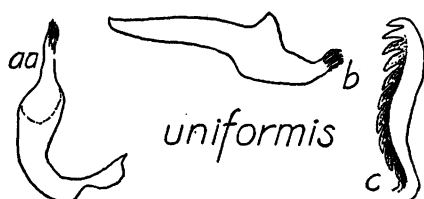


FIG. 140. *Phytocoris uniformis* Knight,—male genital claspers, (aa) left clasper, dorsal aspect, (b) right clasper, lateral aspect, (c) flagellum. Greatly enlarged. Drawing by Dr. H. H. Knight.

Venter: Yellowish to reddish; genital claspers and flagellum (fig. 140) distinctive of the species; flagellum comes nearest to that of *fulvus* while the right clasper shows a closer relationship with *mundus*.

*Female*: Length 5.4 mm., width 2 mm.; more robust than the male but very similar in coloration. Head: Width 1.17 mm., vertex .51 mm. Antennae: Segment i, length .80 mm.; ii, 2.16 mm.; iii, 1.2 mm.; iv, .89 mm.

*Holotype*: Male, 21 Aug., 1917, Wyandanch, Long Island, N. Y. (Chris. E. Olsen); author's collection. *Allotype*: taken with the type. *Paratypes*: Males (3), taken with types. MASSACHUSETTS—Male, 15 July-6 Aug., 1918, Woods Hole (Chris. E. Olsen). *Female*, 9 Aug., 1914, Malden (C. A. Frost).

*Key to Species of Phytocoris, Group IV.*

- |  |                                 |
|--|---------------------------------|
| 1. Pronotal disk with four orange or red vittae on a paler background  | 7                               |
| Pronotal disk frequently red but without four distinct reddish vittae on a paler background  | 2                               |
| 2. Pronotal disk with four black spots on basal submargin; scutellum uniformly pale, sometimes obsoletely dotted with fuscous to form a spot at each side on apical half | (p. 645) <i>quercicola</i>      |
| Pronotal disk without four distinct black spots on basal submargin; scutellum usually with orange or red at each side on apical half                                     | 3                               |
| 3. Pronotum with more pale or fuscous than red   | 5                               |
| Pronotum chiefly red, more red than pale or fuscous  | 4                               |
| 4. Hemelytra with distinct white irrorations; calli darkened with fuscous  | (p. 650) <i>confluens</i>       |
| Hemelytra with white irrorations obsolete, nearly uniformly deep orange-red; calli pale  | (p. 653) (male) <i>puella</i>   |
| 5. Scutellum uniformly bright yellow; hemelytra and pronotum chiefly bright yellow, with an orange vitta along outer margin of callus and extending somewhat to the rear | (p. 649) <i>luteolus</i> n. sp. |
| Scutellum with an orange or reddish mark at each side of median line   | 6                               |

6. Pronotal disk with base and lateral margins dark fusco-reddish; scutellum yellow, with a red mark at each side on apical half but without vittae at middle of base ..... (p. 646) *infuscatus*  
 Pronotal disk chiefly pale, not distinctly darkened laterally or at base; base of scutellum with an orange colored vitta each side of median line and frequently extending to join with orange mark at each side of apical half ..... (p. 647) *olseni* n. sp.
7. (1) Antennal segment ii without slender blackish line on anterior aspect; embolium and outer half of corium marked with reddish 8  
 Antennal segment ii pale but with slender blackish line on anterior aspect; embolium and outer half of corium green; clavus greenish to fuscous, with a rather large irregular reddish blotch on middle and a smaller one on basal half ..... (p. 649) *tibialis*
8. Hemelytra with triangular area just before cuneus, yellow; clavus, basal area of corium and embolium, and cuneus, bright red but irrorate with paler maculations ..... (p. 651) *venustus* n. sp.  
 Hemelytra with apical area of corium marked with reddish, or if not, then basal half of corium without bright red ..... 9
9. Hind femora chiefly pale, marked with reddish only on apical half 10  
 Hind femora heavily marked with red, the red color inclosing pale irrorations, basal one-third pale; hemelytra marked with dark red reticulations, more nearly fusco-reddish on basal half of corium ..... (p. 654) *depictus* n. sp.
10. Dorsum pale, hemelytra reticulately marked with orange or pale reddish, apical area of corium as distinctly marked as the basal half; membrane pale, somewhat dusky at base ..... (p. 653) *puella*  
 Dorsum pale greenish yellow, reticulation of hemelytra dusky, apical area of corium without dark marks; membrane infuscated (p. 652) *caryae* n. sp.

### *P. quercicola* Knight.

Bull. Brook. Ent. Soc., xv, 60, 1920.

*Male*: Length 4.7 mm., width 1.7 mm. Head: Width .91 mm., vertex .3 mm., basal half of lora, spot each side of tylus, transversely across the front and four marks on vertex, red, front with prominent pale hairs. Rostrum, length 2.2 mm., attaining base of genital segment, pale, infuscated at apex.

Antennae: Segment i, length .97 mm., pale, three irregular marks on dorsal surface, broadly banded at apex with fusco-brownish or reddish, beset with six to eight prominent pale spines; ii, 2.25 mm., pale brownish, pale annulus at base, next to this and again at apex darker fuscous; iii, 1.25 mm., fusco-brownish, annulated with paler at base, middle and narrowly at apex; iv, 1.04 mm., fuscous.

Pronotum: Yellowish, outer half of calli and extending broadly to the rear, narrowing and curving inward to form submarginal line on middle two-fourths, but interrupted at median line, fusco-brownish to dark fuscous; submarginal line frequently forming two blackish points each side of the median line, narrow basal margin pale; yellowish to dusky pubescent, longest hairs situated anteriorly and on collar. Scutellum pale, median line frequently reddish, each side of this with an indistinct vitta composed of small brownish dots.

Hemelytra: Pale, more or less translucent, an irregular patch