

Coll.). A European species which Van Duzee records as taken by Mrs. A. T. Slosson in Florida.

X. ORTHOTYLUS Fieber, 1858, 315.

Elongate-oval or oblong-oval species having the head wider across eyes than apex of pronotum, its front vertical; vertex with a basal carina and in front of it a depressed line or area; tylus prominent, its base usually on a line with base of antennæ; beak reaching beyond middle coxæ, its tip blackish; antennæ pubescent, shorter than body, basal joint stoutest, 3 and 4 setaceous; pronotum trapezoidal, rather flat, usually wider at base than long, sides straight, converging, basal margin feebly concave or straight; mesoscutum usually exposed; scutellum triangular, equilateral; elytra entire, surpassing abdomen, clavus deflexed toward corium, cuneus and membrane feebly deflexed, the latter 2-celled.

The North American species were monographed by Van Duzee in 1916. About 45 species are known from this country, 21 of which have been recorded from the eastern states. For convenience of study these are separated into two groups as follows:

KEY TO GROUPS OF EASTERN SPECIES OF ORTHOTYLUS.

- a. Ground color green or greenish-yellow, sometimes almost white, dark markings, if present, not clouding the elytra. GROUP A, p. 854.
- aa. Ground color pale brownish-yellow to black, sometimes greenish when immature, but the elytra, in that case, marked with fuscous or black. GROUP B, p. 859.

GROUP A.—ORTHOTYLUS.

This group comprises small, moderately elongate green or greenish-yellow species having the base of vertex sharply carinate; pronotum short, transverse; legs short. It includes eight of our eastern species.

KEY TO EASTERN SPECIES OF GROUP A, ORTHOTYLUS.

- a. Upper surface with two types of pubescence, viz., closely appressed scale-like hairs intermixed with longer inclined or suberect slender ones.
- b. Antennæ green or greenish-yellow; veins and cells of membrane green.
- c. Upper surface without patches of appressed black scales; color pale green or greenish-yellow; host plant, lamb's quarters, *Chenopodium album* L. 929. FLAVOSPARSUS.

- cc. Upper surface with numerous small scattered patches of appressed black scales; pronotum and elytra dark green; host plant, holly-hock, *Althæa rosea* Cav. 930. ALTHÆÆ.
- bb. Antennæ with joints 3 and 4 and apical half of 2 fuscous-brown; veins and cells of membrane pale brown. 931. CONCOLOR.
- aa. Upper surface with inclined or suberect pubescent hairs only.
- d. Smaller species, length not more than 4.5 mm.; first joint of antennæ shorter than head.
- e. Pubescence of upper surface blackish; antennæ and membrane wholly pale; host plant honey-locust, *Gleditsia triacanthos* L. 932. CHLORIONIS.
- ee. Pubescence of upper surface pale; apical half of antennæ fuscous; membrane pale, its veins green; host plant burdock, *Arctium minus* Schk. 933. TRANSLUCENS.
- dd. Larger species, length more than 4.5 mm.; first antennal as long as or longer than head.
- f. Basal joint of antennæ pale brownish-yellow; length, 5.5—6 mm. 934. UNIFORMIS.
- ff. Basal joint of antennæ brown or black; host plant, willow.
- g. Pubescence of upper surface fine; basal joint of antennæ brown; length, 5 mm. 935. VIRIDIS.
- gg. Pubescence of upper surface coarse, conspicuous; basal joint of antennæ black; length, 5.8—6.5 mm. 936. BASICORNIS.

929 (1172). ORTHOTYLUS FLAVOSPARSUS (Sahlberg), 1842, 411.

Oblong-oval. Pale green fading to greenish-yellow; head, calli and lower surface dull yellow; membrane slightly dusky, the cells and veins greenish; tips of tibiæ and tarsi brownish. Upper surface with pubescence as in key, in fresh specimens the pale buff scale-like hairs often forming small spots on elytra. Vertex flat with a median depression in front of basal carina, this more conspicuous in male. Pronotum twice as wide as long, its basal margin straight. Elytra surpassing abdomen by less than one-half the length of membrane. Length, 4—4.2 mm.

Marion Co., Ind., June 12—Aug. 22; swept from lamb's quarters, grasses and other herbage along railway embankments and roadsides. Cape Sable, Fla., Feb. 22; not before recorded from that State (*W. S. B.*). Swannanoa, N. Car., July (*Brimley*). A European species ranging in this country from Quebec and New England west to the Dakotas and Kansas and south-west to Virginia and Florida. Occurs mainly on *Chenopodium*.

930 (—). ORTHOTYLUS ALTHÆÆ Hussey, 1924, 165.

Oblong-oval. Head, front lobe of pronotum and legs dull yellow; hind lobe of pronotum and elytra dark green; membrane pale dusky translucent, the veins whitish; under surface greenish-yellow; tarsal claws fuscous. Pubescence as in key, the blackish, scale-like hairs conspicuous and scattered over the entire upper surface. Joints 1 and 2 of antennæ dull yellow, 1 slightly longer than width of vertex, 2 nearly

four times as long as 1; 3 in part and 4 fuscous, 3 one-eighth shorter than 2, 4 one-half as long as 3. Pronotum twice as wide as long, calli very prominent, front angles with a long seta directed outward and forward. Elytra but slightly passing tip of abdomen. Length, 3.5—3.8 mm.

Lafayette, Ind., May 15; taken from hollyhock. Known as the "hollyhock bug." Recorded only from Michigan. Hussey found it common at Ann Arbor, June to late September; all stages occurring on the upper side of the leaves of hollyhock and doing serious damage thereto. Originally described⁸⁸ by A. J. Cook as *Orthotylus delicatus* Uhler (Ms.), which name was preoccupied.

931 (—). *ORTHOTYLUS CONCOLOR* (Kirschbaum), 1855, 315.

Elongate, sides subparallel. Bluish-green, thickly clothed with fine short silvery appressed hairs, intermixed with numerous inclined stouter blackish ones; head and apical third of pronotum fading to dull yellow; membrane uniformly pale brownish-hyaline, iridescent, veins yellowish to dusky; legs yellowish-green, third joint and claws of tarsi piceous. Joint 1 of antennæ greenish, three-fourths as long as width of vertex; 2 yellowish, brownish toward apex, three and a half times as long as 1; 3 and 4 dark brown, 3 three-fourths as long as 2, 4 one-third the length of 3. Length, 4.2—4.6 mm.

Herefordshire, England, Aug. 13 (*British Mus. Coll.*). A European species recorded in this country only from Massachusetts. Somewhat larger and stouter than *flavosparsus* and without small yellow pubescent spots on elytra.

932 (1173). *ORTHOTYLUS CHLORIONIS* (Say), 1832, 25; I, 346.

Elongate-oval. Pale green or greenish-yellow, fading to straw-yellow; above sparsely clothed with short inclined blackish hairs; legs and antennæ concolorous; membrane pale, the veins only greenish. Joint 1 of antennæ as long as width of vertex, 2 three and a half times as long as 1, 3 two-thirds the length of 2, 4 two-fifths as long as 3. Vertex convex, with basal carina prominent. Calli not conspicuous. Elytra surpassing abdomen by one-half the length of membrane. Length, 3.5—4 mm. (Fig. 184).

Marion and Vigo counties, Ind., June 3—July 15; frequent on leaves of the host plant, the thorn or honey-locust. Described from Indiana. The known range extends from Quebec and New England west to Indiana. Recorded also from California. Specimens are at hand, identified for me by Uhler as *O. alternatus* Uhler (Ms.). It is more robust than *flavosparsus*, from which it may be separated by the concolorous cells of membrane and lack of patches of pale pubescence; from *uniformis*

⁸⁸Bull. 76, Mich. Agr. Coll. Exp. Stat., 1891, 10.

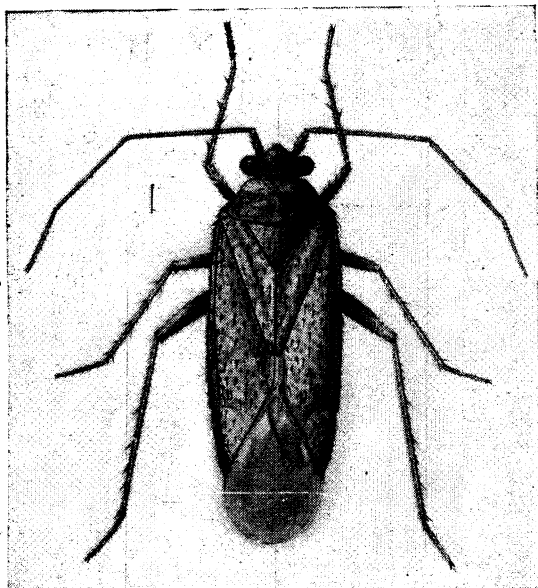


Fig. 184, X 14. (After Forbes).

by the smaller size and shorter elytra and from *translucens* by the suberect dark hairs of upper surface. Forbes in his Tenth Illinois Report (1909, 90) calls it the "green leaf-bug," and says it is "very common in July on the sugar beet in Illinois, causing a whitish mottling of the leaves. It is to some extent nocturnal and has been taken at electric lights."

933 (1174). *ORTHOTYLUS TRANSLUCENS* Tucker, 1907, 58.

Clear green, head, calli, scutellum and under surface tinged with yellowish; upper surface sparsely clothed with pale hairs; membrane dusky, iridescent, veins pale green; elytral nervures, outer margin of cuneus and knees dark green. Joint 1 of antennæ greenish-yellow, shorter than head; 3 and 4 and apical half of 2 fuscous; 2 about as stout as 1, nearly four times longer. Head shorter and more vertical than in allied forms. Pronotum about twice as wide at base as long at middle, calli not prominent. Mesoscutum rather broadly exposed. Elytra surpassing abdomen by half the length of membrane. Length, 4 mm.

Henderson, Ky., April 30 (*Marshall*). Recorded from Buffalo and Elma, N. Y., and Colorado.

934 (1173½). *ORTHOTYLUS UNIFORMIS* Van Duzee, 1916b, 100.

Elongate-oval. Color a nearly uniform greenish-yellow, rather thickly clothed with short pale hairs; joints 3 and 4 of antennæ fuscous-brown;

head, calli, legs and lower surface somewhat paler; membrane pale translucent, strongly iridescent, veins green; tips of tarsi and of beak black. Head more pointed than in allied forms. Beak reaching between hind coxæ. Pronotum subdepressed, sides strongly oblique, feebly concave, the disk therefore much narrowed in front, transverse impression behind calli conspicuous. Apex of abdomen scarcely reaching base of cuneus, male; almost reaching its tip, female. "Dextral hook of male genital short, straight, ligulate, its tip incurved and subacute; sinistral hook long, curved in almost a semicircle, its apex slender, acuminate." Length, 4.8—6 mm.

Lake Tahoe, Cal. (type locality), July 19 (*Van Duzee*). Recorded also from Salamanca, N. Y., and Phoenix, Ariz. Host plant unknown.

935 (1175½). *ORTHOTYLUS VIRIDIS* Van Duzee, 1916b, 103.

Elongate, sides subparallel. Color a nearly uniform green; head, front lobe of pronotum, scutellum, legs and under surface usually rather strongly tinged with yellow; costal margin often whitish; membrane whitish-hyaline, lightly tinged with fuscous, veins yellowish or pale green; tips of tarsi blackish. Joints 1, 3 and 4 of antennæ pale- to fuscous-brown, 2 yellowish; 1 as long as width of vertex, 2 three and a half times as long as 1, 3 three-fourths the length of 2, 4 one-third as long as 3. Eyes very large, globose. Beak reaching middle coxæ. Basal carina of vertex straight, acute. Pronotum much narrowed in front, its length two-thirds its basal width; calli large, not prominent. Length, 4.6—5 mm.

Guilford, Conn., July 13 (*Walden*). Ranges from that state west to South Dakota and south to North Carolina. Breeds on willow.

936 (—). *ORTHOTYLUS BASICORNIS* Knight, 1923, 515.

Elongate-oval. Head, beak, front lobe of pronotum, tip of scutellum and legs dull yellow; hind lobe of pronotum, elytra and under surface pale green fading to greenish-yellow; membrane pale translucent, the veins greenish; tip of beak, joints 1 and 3 of tarsi and claws, fuscous-brown; upper surface, including costal margins, with conspicuous pubescence of rather long and coarse inclined yellowish hairs. Joint 1 of antennæ fuscous-brown to blackish, slightly longer than width of vertex; 2 pale reddish-brown, three times as long as 1; 3 and 4 fuscous-brown, 3 one-half the length of 2, 4 three-fifths as long as 3. Pronotum with calli prominent, merged at middle to form a wide collar-like ridge in front of the transverse impression. Length, 5.8—6.5 mm.

Marion Co., Ind., June 19—July 15; beaten in numbers from its host plant, the sandbar willow, *Salix fluviatilis* Nutt. The known range extends from Quebec and New York west to Minnesota and Illinois, but the distribution is probably coextensive with its host plant.

GROUP B.—ORTHOTYLUS.

Usually elongate, slender, subparallel species having the base of vertex sharply carinate and with a bi-impressed concavity between the base of eyes; pronotum about as long as broad; legs long and slender. Color usually pale brownish-yellow or reddish-yellow, with more or less fuscous or blackish, the elytra typically having the clavus and apical half of corium in part fuscous or black. To this group belong 13 of our eastern species of the genus.

KEY TO EASTERN SPECIES OF GROUP B, ORTHOTYLUS.

- a. Form oblong-ovate; color a nearly uniform whitish- or pale brownish-yellow; elytra translucent; head and calli yellowish; host plant, marsh cudweed, *Gnaphalium uliginosum* L. 937. CATULUS.
- aa. Form more elongate, sides subparallel; elytra with fuscous areas, or at times nearly black.
- b. Color pale testaceous, elytra translucent with dark markings faint, almost wanting in female; median line of head and scutellum, side margins of pronotum and sides of under surface black; host plant American aspen, *Populus tremuloides* Michx. 938. CANDIDATUS.
- bb. Ground color sometimes pale greenish- or yellowish, but dark markings of elytra always distinct.
- c. Upper surface brownish-black, the elytra with only the embolium, narrow base of corium and nerves of commissure pale; median line or spot of pronotum and sometimes of scutellum pale; length, 6.8—7 mm.; host plant, yellow birch, *Betula lutea* Michx. 939. NECOPINUS.
- cc. Elytra in female with more than embolium and slender base of corium pale; in male sometimes nearly wholly black; length usually less than 6 mm.
- d. Pronotum with side margins black, disk broadly pale or reddish-yellow, sometimes with only the median line pale.
- e. Disk of pronotum and sometimes the elytra in part, fulvous or reddish-yellow.
- f. Elytra black, the female with a broad pale stripe extending the full length of corium and connecting with the pale cuneus; legs fulvous, apical half of hind femora blackish; length, 5.4 mm.; host plant, balm of gilead, *Populus candicans* Ait. 940. KNIGHTI.
- ff. Elytra chiefly fulvous or salmon colored, blackish each side of commissure and on embolium; length, 4.7 mm.; host plant, black locust, *Robinia pseudacacia* L. 941. SUBMARGINATUS.
- ee. Disk of pronotum with pale or greenish.
- g. Pronotal disk broadly pale; scutellum black; membrane and apical half of cuneus dark fuscous; clavus and a broad transverse band across apex of corium, fuscous-black; length, 5.5—6 mm. 942. CRUCIATUS.

- gg. Pronotal disk not so broadly pale; general color black or fuscous-black.
- h. Embolium and outer margin of corium pale greenish translucent.
- i. Pronotum and scutellum without a pale median line; length, 5.5 mm.; host plant, willow. 943. MARGINATUS.
- ii. Pronotum with a pale median line extending from its apex to tip of scutellum; length, 6 mm.; host plants, thorn, *Cratægus*, and apple. 944. SERUS.
- hh. Corium blackish at outer margin except at base; scutellum black, rarely pale at middle; length, 5.6—6 mm.; host plant, smooth alder, *Alnus rugosa* (Du Roi). 945. ALNI.
- dd. Pronotum of female with side margins pale or greenish, disk usually in part blackish, often with median line pale; of male sometimes almost wholly blackish.
- j. Hind femora blackish except at base; scutellum broadly pale; upper surface in great part blackish, the paler parts tinged with reddish; length, 5.6—6 mm.; host plant, brittle willow, *Salix fragilis* L. 946. ORNATUS.
- jj. Hind femora greenish; scutellum sometimes broadly pale, but then the femora not dark.
- k. Pronotal disk transversely pale behind calli; calli and basal margin of disk brown or blackish, disk sometimes wholly pale; length, 4.5 mm.; host plant, brittle and black willows. 947. MODESTUS.
- kk. Pronotal disk almost wholly black, male; with blackish rays each side of median line, connecting calli with basal margin, female; host plant, black willow.
- l. Smaller, length 5.2 mm.; veins of membrane paler than the disk; corium with inner apical half fuscous, the pale color of basal half extending along claval suture. 948. DORSALIS.
- ll. Larger, length 5.8—6 mm.; veins and disk of membrane a uniform dusky; pale color of basal half of corium not extending along claval suture to separate black of corium from that of clavus. 949. NEGLECTUS.

937 (1175½). ORTHOTYLUS CATULUS Van Duzee, 1916b, 106.

Elongate-oval. Pale grayish-yellow, elytra often tinged with brownish or fuscous, head and calli with yellowish; upper surface thickly clothed with pale to dusky pubescence; membrane dusky hyaline, veins whitish; tips of tarsi and beak black. Antennæ slightly dusky apically, joint 1 scarcely half as long as width of vertex, 2 nearly as stout as and three times longer than 1. Beak reaching first ventral. Vertex flat in front of the obtuse basal carina. Pronotum with sides straight, front margin concave, calli large, not prominent. Elytra surpassing abdomen by nearly the length of membrane; costal margin feebly but distinctly curved. Length, 4.2—4.5 mm.

Hamburg, N. Y., June 6 (*Van Duzee*). Definitely recorded only from Maine, Connecticut and New York. Occurs on cudeed in woodland pastures. "The pale testaceous color of this insect gives it the appearance of being immature." (*Van Duzee*).

938 (1178¼). *ORTHOTYLUS CANDIDATUS* Van Duzee, 1916b, 124.

Elongate, sides subparallel. Color as in key, clothed with minute pale pubescence; head and antennæ tinged with fulvous, pronotum, scutellum and legs with yellow; elytra whitish-yellow, subhyaline, with a vague fuscous line inside the principal vein; membrane slightly fuscous, cell milky-hyaline, veins brownish; tips of tibiæ and tarsi fuscous. Antennæ wholly black, male; joint 1 blackish, 2 reddish-brown, female, its apex and all of 3 and 4 fuscous. Vertex with basal carina prominent. Eyes large, oval. Beak reaching base of middle coxæ. Pronotum with calli large, their inner margins subcontiguous and basal ones bounded by a slightly curved conspicuous transverse impressed line. Length, 4.3—5 mm.

Two Harbors, Minn., Aug. 9 (*Minn. Univ. Coll.*). Described from Mt. Washington, N. Hamp. Taken in Minnesota only on aspen growing on the edge of bluffs bordering Lake Superior.

939 (1178½). *ORTHOTYLUS NECOPINUS* Van Duzee, 1916b, 125.

Elongate-oval. Head with front black, vertex with base, median line and elongate spot each side adjoining eye, greenish;; antennæ black, apical joints paler; pronotum with front margin and middle of basal half pale or greenish, rarely wholly black; color of elytra as in key; membrane fuscous, veins and a mark near apex of cuneus paler; beak and legs pale brownish-yellow, tarsi blackish; ventrals shining black with median whitish stripe. Eyes very large and prominent. Vertex strongly flattened, the basal carina prominent. Beak reaching base of middle coxæ. Pronotum much narrowed in front, two-thirds as long as wide at base, sides concave, disk flattened, basal half finely transversely rugose, calli small but prominent, hind margin broadly concave. Mesoscutum moderately exposed. Elytra gradually feebly widened from base to cuneus. Length, 6.6—6.8 mm.

Whiteface Mt. trail, N. Y., July 6 (*Davis*). Fairbault, Minn., June 12 (*Minn. Univ. Coll.*). Recorded only from Mt. Washington, N. Hamp., and Buffalo, N. Y. Breeds on yellow birch. Readily known by the large size and dark fuscous-brown color.

940 (1179%). *ORTHOTYLUS KNIGHTI* Van Duzee, 1916b, 121.

Elongate, slender, sides subparallel. Fuscous-black, sparsely clothed with very fine prostrate yellowish hairs; male with a small median spot on hind lobe of pronotum and a vague narrow stripe along the outer margins of basal half of corium, dull yellow; female more robust with pale spot and stripe conspicuous, the former covering most of pronotal disk and more or less of the calli, the elytra as in key; membrane translucent fuscous, paler near tips of cuneus; lower surface of head, beak

except tip, coxæ and femora dull yellow; tibiæ, tarsi and apex of hind femora fuscous-brown. Antennæ fuscous-black; joint 1 as long as width of vertex plus one eye; 2 three times as long as 1, 3 one-third the length of 2, 4 one-third as long as 3. Vertex with a distinct concavity in front of basal carina. Eyes large, prominent, in male as wide as vertex. Pronotum much narrowed in front, the calli prominent. Elytra long, slender, in male slightly tapering from base to cuneus. Length, 5.2—5.4 mm.

Attica, N. Y., July 6 (*Gerhard*). Known only from that State. Occurs on willow and balm of gilead.

941 (1178). *ORTHOTYLUS SUBMARGINATUS* (Say), 1832, 23; I, 344.

Pale salmon-yellow; front of head with a shining black spot on cheeks and base of tylus; antennæ blackish, basal joint paler; sides and flanks of pronotum broadly black; apex of scutellum fuscous; elytra each with a stripe bordering commissure and usually a subcostal line, blackish, cuneus pale, its tip fuscous; membrane fuscous-hyaline; legs pale, hind tibiæ fuscous to black, joint 3 and claws of tarsi fuscous; ventrals pale, a broad fuscous stripe each side. Vertex depressed, basal carina prominent. Pronotum subconvex, slightly declivent, hind lobe transversely strigose. Mesoscutum exposed. Elytra surpassing abdomen by three-fifths the length of membrane. Length, 4—4.6 mm.

Ithaca, N. Y., July 7 (*Minn. Univ. Coll.*). Described from Indiana. Recorded from New England, New York and Missouri. Occurs in July and August on black locust and its range probably coextensive with that of its host plant.

942 (1179%). *ORTHOTYLUS CRUCIATUS* Van Duzee, 1916b, 119.

Elongate, sides subparallel. Color as in key, sparsely clothed with short pale hairs; head black, shining, vertex usually with dot near each eye and often a basal spot paler; pronotum with calli and submarginal stripes black; mesoscutum fulvous; elytra whitish with dark markings as in key; legs pale brownish-yellow, femora paler at base, tips of tarsi black; under surface pale with a broad black stripe each side and on genital. Joints 1 and 2 of antennæ fuscous-black, 1 slightly longer than head, 2 four times as long as 1; 3 and 4 brown or dusky yellow, united three-fourths the length of 2, 3 twice as long as 4. Vertex feebly depressed, its basal carina low. Eyes very large, much wider than vertex. Pronotum long, nearly flat; calli large, feebly elevated. Cuneus narrow, acute, twice as long as its basal width. Tip of abdomen reaching base of cuneus, male, nearly to its middle, female. Length, 5.5—6 mm.

Wyandanch, Long Island, N. Y., June 20 (*Olsen*). Ashland, Mass., May 2 (*Frost*). Known elsewhere only from Quebec and New England. Host plant as yet unrecorded. "Readily known by the black lateral margins of pronotum and conspicuous cruciate black markings on elytra." (*Van Duzee*).

943 (1177). *ORTHOTYLUS MARGINATUS* (Uhler), 1895, 43.

Black, sparsely clothed with pale appressed hairs; costal margin of elytra, legs and middle of ventrals pale greenish-yellow; female with pale color of elytra sometimes encroaching upon the base of claval suture and veins of corium; cuneus yellowish, its inner angle fuscous; membrane blackish, veins pale at apex; legs pale greenish, tibiæ and tarsi with tips darker; ventrals, except along middle, black. Antennæ black, reaching cuneus, joint 1 stouter than 2, longer than head; 2 as long as clavus; 3 and 4 more slender, 3 one-half as long as 2, twice as long as 4. Beak reaching tips of middle coxæ. Vertex but little flattened, its carina sharp and high. Pronotum three-fifths as long as wide at base, sides distinctly sinuate; calli large, prominent, not united in front; basal half of disk finely transversely rugose. Apex of abdomen reaching middle of cuneus, male, nearly to its tip, female. Length, 5—5.5 mm.

Quinze Lake, Quebec, and Hamburg, N. Y., June 14—Aug. 15 (*Van Duzee*). Described from Colorado. Not recorded elsewhere.

944 (—). *ORTHOTYLUS SERUS* Van Duzee, 1921, 131.

Closely allied to *marginatus*. Differs by characters given in key and by having the pale costal stripe on elytra broader, its inner margin straight in both sexes; cuneus dull yellow, inner half largely fuscous; membrane pale fuscous with pale spot near apex of cuneus, its veins wholly dark. Vertex distinctly flattened, its basal carina obtuse. Pronotum with front of calli connected by an elevated line; basal half of disk finely transversely strigose. Beak reaching middle of hind coxæ. Length, 6 mm.

Salamanca, N. Y., July 24 (*Van Duzee*). Batavia, N. Y., July 5 (*Minn. Univ. Coll.*). Recorded elsewhere only from Hamburg, Gowanda and Colden, N. Y. Host plants as in key.

945 (—). *ORTHOTYLUS ALNI* Knight, 1923, 521.

Black; narrow line along side margins of eyes, narrow median stripe on basal half of pronotum, stripe bordering radial vein to beyond middle of corium and spot at base of cuneus, dull yellowish-translucent; membrane and veins uniformly dark fuscous; legs dark green, knees, tarsi and tips of tibiæ blackish. Joints 1 and 2 of antennæ black, 3 and 4 fuscous; 1 as long as width of vertex plus one eye, 2 three times as long as 1, 3 two-fifths the length of 2, twice as long as 4. Female with cuneus and base of embolium more broadly translucent. Length, 5.6—6 mm.

Beaver Bay, Minn., Aug. 20 (*Minn. Univ. Coll.*). Recorded only from Eastport, Me., and New York. Host plant as in key.

946 (1179½). *ORTHOTYLUS ORNATUS* Van Duzee, 1916b, 122.

Male—Elongate, sides subparallel, rather robust. Fuscous-black, rather thickly and very finely pubescent; cheeks, base of vertex, narrow side margins of pronotum, tip of scutellum, cuneus and basal half of corium, dull yellow; membrane pale fuscous, veins and spot on apical half

paler; legs dull yellow, the tarsi and hind femora darker; under surface dark brown, the genital region paler. Antennæ fuscous-brown, apex of joint 2 darker; joint 1 as long as head, 2 three and a half times longer than 1, 3 and 4 united about two-thirds the length of 2. Eyes very large, coarsely granulated. Pronotum relatively broad, calli large, rather low, hind lobe moderately convex, distinctly shagreened. Elytra broad, surpassing abdomen by one-half the length of membrane. *Female*—Color as in key, the broad side margins and median line of pronotum and basal half of both corium and clavus dull greenish-yellow. Membrane surpassing abdomen by only one-fourth its length. Length, 5.6—6 mm.

Honeoye Falls, N. Y., June 27 (*Davis and Gerhard*). Recorded only from Connecticut and New York, occurring on brittle-willow. "The large size and maculated membrane will distinguish this species. It has somewhat the aspect of *Lopidea cuneata* Van D. or of a *Plagiognathus*." (*Van Duzee*).

947 (1175%). *ORTHOTYLUS MODESTUS* Van Duzee, 1916b, 109.

Female—Elongate-oval. Pale green to yellowish, deeper green along the claval suture; upper surface with gray pubescence; head tinged with fulvous, a brown dot at base of tylus; pronotum with a lunate brown or fuscous spot behind each callus, these often united to form a transverse stripe, the hind margin with a broader fuscous bar; mesoscutum fulvous; clavus, except at base and apex, and a large spot on inner apical angle of corium fuscous; membrane fuscous, veins pale, their base darker; legs and under surface pale tinged with greenish, tips of tarsi dark. *Male*—Sides subparallel, color mostly black. Joint 1 of antennæ black, 2 brown, paler at base, 3 and 4 fuscous. Pronotum with sides nearly straight, surface transversely rugose; calli low, ill defined. Abdomen passing tip of cuneus. Tibial spines longer than in allied species. Length, 4.5—5 mm.

Batavia, N. Y., July 19 (*Minn Univ. Coll.*). Known only from New York and Pennsylvania, where it breeds on willow. A variety *immaculatus* Knight, uniformly green with only the membrane fuscous, is known from New York and Ottawa, Ontario.

948 (1176). *ORTHOTYLUS DORSALIS* (Provancher), 1872, 104.

Male—Elongate, subparallel. General color black, median line of pronotum often paler; cuneus, embolium, base and a ray along radial vein of corium, greenish-translucent; membrane fuscous, veins paler; legs green, coxæ paler. *Female*—More suboval. Pale green to greenish-yellow with pale and dark markings as in key, under surface in both sexes with a black stripe along sides. Antennæ black, male, tinged with fuscous, female; joint 1 as long as head, 2 three and one-half times as long as 1, 3 three-fifths the length of 2, 4 one-half as long as 3. Vertex but slightly broader than eye, male, nearly twice as broad, female. Pronotum much narrowed in front, its length two-thirds its basal width, sides distinctly sinuate, disk vaguely transversely rugose; calli large, oval, prominent, connected in front, well separated by a depressed area

behind middle. Tip of abdomen reaching apex of cuneus. Length, 5—5.5 mm.

White Plains, N. Y., June 29 (*Olsen*). Ranges from Quebec and New England west to New York. Host plant, willow.

949 (—). *ORTHOTYLUS NEGLECTUS* Knight, 1923, 515.

Male—Elongate, subparallel. Fuscous-black, sparsely clothed with very fine prostrate yellowish hairs; narrow side margins of pronotum, cuneus, embolium, outer margin of basal two-thirds of corium, legs, beak and middle of under surface greenish-yellow; sides of under surface shining brown; tips of beak and tarsi fuscous. Joint 1 of antennæ reddish-brown, nearly as long as head; 2 greenish-yellow, more than three times as long as 1; 3 and 4 tinged with fuscous, united three-fourths the length of 2. Pronotum with sides feebly but visibly sinuate; calli broad and low, united in front, separated by a median depression behind; disk transversely rugose. Elytra long, narrow, with sides parallel, but slightly surpassing tip of abdomen. *Female*—More robust and more broadly pale, the pronotum and scutellum with median line pale. Length, 5.2—5.8 mm.

Marion Co., Ind., June 12; beaten from black willow, *Salix nigra* Marsh. Port Credit, Ontario, July 1 (*Olsen*). Known heretofore from Nova Scotia, New England and New York. Very close to *dorsalis* and may prove to be only a color variety of that species.

XI. *NOCTUOCORIS* Knight, 1923, 523.

Differs from *Orthotylus* mainly by the characters given in generic key. Upper surface clothed with appressed scale-like hairs intermixed with more erect slender ones; head distinctly oblique, female, much less so, male; pronotum moderately sloping, almost flat, sides nearly straight, calli convex, delimited behind by an impressed line which merges with an impression between them; ventrals 1—6 each with an impressed glabrous spot on sides near spiracles; legs long, suggesting *Phytocoris*, but femora not distinctly broader at base.

950 (1178¾). *NOCTUOCORIS FUMIDUS* (Van Duzee), 1916b, 127.

Elongate, subparallel, male, slightly larger and more robust, female. Color a uniform fuscous-brown; head, apex of pronotum and base of legs often tinged with rufous; tip of scutellum pale; membrane fuscous, nerves of the small cell pale; front face of femora with an interrupted fuscous line; upper margin and posterior face with a row of small dark spots; sterna fuscous, sides of ventrals with a black stripe. Joint 1 of antennæ brown, as long as width of vertex; 2 brownish-yellow, fuscous at tip, three times as long as 1; 3 and 4 fuscous, 3 three-fifths as long as

2, 4 one-third the length of 3. Front of head vaguely transversely striate. Mesoscutum narrowly exposed. Abdomen reaching tip of cuneus. Length, 5.7—6 mm.

St. Anthony Park, Minn., and Brookings, S. Dak., June 25 (*Minn. Univ. Coll.*). A species apparently of northern distribution, ranging from New York and Pennsylvania west to the Dakotas and Colorado. Taken mainly at light in July and August. Host plant unknown.

Subfamily IV. BRYOCORINÆ Douglas & Scott, 1865, 28, 276.

Small oval or oblong-oval, shining species having the head short, inserted in thorax to eyes, its front vertical or nearly so, vertex without a basal margin; antennæ slender, filiform, nearly as long as body, separated at base by a distance less than width of vertex; pronotum trapezoidal or subcampanulate, constricted at apical third, usually without a collar, disk punctate, hind portion convex, often strongly so; scutellum small, triangular, much shorter than the commissure; elytra usually entire, clavus strongly deflexed toward corium, membrane one-celled; hind femora short, not swollen; tibiæ without spines. Other characters as in subfamily key, p. 663.

Our species are few in number, but often abundant in individuals. They occur, for the most part, on ferns growing in wet places (whence the subfamily name) or on herbage in dense woodland. Representatives of six North American genera are known from the eastern states.

KEY TO EASTERN GENERA OF BRYOCORINÆ.

- a. Form shorter, ovate or subovate; sides of elytra more or less curved.
- b. Pronotum without a distinct collar, its hind lobe convex, sometimes strongly so.
 - c. Scutellum with a triangular discal impression; pronotum densely, finely punctate.
 - d. Basal joint of antennæ scarcely three-fifths as long as width of vertex, inserted close to apex of eye; head and pronotum dull red; elytra not flecked with pubescent spots.
 - I. HALTICOTOMA, p. 867.
 - dd. Basal joint of antennæ as long as width of vertex, inserted above and behind apex of eye; head and pronotum black; elytra flecked with pubescent spots.
 - II. CYRTOCAPSUS, p. 867.
- cc. Scutellum without a triangular discal impression; pronotum coarsely and densely punctate; elytra without pubescent spots.
 - e. Hind lobe of pronotum strongly convex and usually with a deep median impression; embolium broadly flattened, its width as great as that of hind femora.
 - III. PYCNODERES, p. 868.

- ee. Hind lobe of pronotum moderately convex, without a median impression; embolium linear, somewhat thickened. IV. SIXENOTUS, p. 871.
- bb. Pronotum with a distinct collar, its hind portion but moderately convex, sparsely punctate; basal antennal shorter than width of vertex. V. MONALOCORIS, p. 874.
- aa. Form elongate-oblong; sides of elytra parallel or nearly so; second joint of antennæ not longer than width of head across eyes; pronotum with a distinct collar. VI. SYSINAS, p. 875.

I. HALTICOTOMA Reuter, 1913a, 278.

Small oval, thinly pubescent species having the head broader across eyes than long; eyes sessile, adjacent to and overlapping front angles of pronotum, vertex very wide; pronotum trapezoidal, twice as wide at base as long at middle, hind angles broadly rounded, hind margin subtruncate; mesoscutum concealed; scutellum with sides elevated, the disk therefore with a deep triangular concavity which is carinate along the middle; elytra entire, surpassing abdomen. One species is known.

951 (1073). HALTICOTOMA VALIDA Reuter, 1913a, 279.

Short, oval. Head, pronotum, base of scutellum, sterna and legs dull red or reddish-brown; elytra blue-black; membrane dusky-hyaline, veins brown. Ventrals reddish at middle, piceous on sides. Antennæ dark brown, joint 1 three-fifths as long as width of vertex, 2 twice as long as 1. Length. 3—3.5 mm.

Dunedin, Fla., March 15; one specimen swept from flowers of Adam's needle, *Yucca filamentosa* L. A southwestern species abundant on *Yucca* in Texas, New Mexico and Arizona, but not before recorded east of the Mississippi.

II. CYRTOCAPSUS Reuter, 1876, 78.

Oblong-oval, pubescent species having the head as wide at base as long, its front subvertical; tylus small, compressed, longer than cheeks; eyes large, oblong, widely separated; beak reaching middle coxæ; pronotum with base two-thirds wider than apex, disk moderately convex, sides sinuate, calli large, low, with a deep depression between and behind them; elytra entire, subdepressed, corium much widened toward apex, embolium rather wide and thick, cuneus as wide at base as long, strongly deflexed; membrane surpassing abdomen by more than half its length. One species is known.

952 (1072). CYRTOCAPSUS CALIGINEUS (Stal), 1859a, 258.

Oblong-oval. Black, subopaque, thickly clothed with short yellowish or grayish pubescence, which is condensed to form small spots on

elytra; corium often in great part brown, cuneus velvety-black; membrane hyaline-white, fuscous at base, veins and cells blackish; legs whitish-yellow, tibiæ and beak tinged with yellow. Joints 1 and 2 of antennæ pale yellow, 1 one-tenth shorter than width of vertex; 2 one-half longer than 1, slightly thickened toward apex; 3 and 4 fuscous-brown, 3 three-fourths the length of 2, 4 slightly longer than 2. Pronotum as under genus heading, its front portion declivent; disk thickly and evenly punctate, and with a subbasal impression near each humeral angle. Mesoscutum convex, narrowly exposed. Length, 2.7—3.1 mm.

Royal Palm Park, Hillsboro Canal and Dunedin, Fla., Nov. 18—April 3; swept from low herbage and beaten from cedar and moonvine along the borders of moist hammocks. Recorded from Crescent City, Fla.; also from California. A neotropical species ranging south from Florida through the West Indies and Mexico. The pubescence in specimens beaten from the same plant varies in hue from golden-yellow to gray, the holotype of var. *aureopubescentis* Knight (1926c, 102) being based upon a specimen in which it is of the former hue.

III. PYCNODERES Guerin, 1857, 168.

Small oval or oblong-oval species having the head, pronotum and scutellum punctate, shining; elytra opaque, almost smooth; head wider across eyes than apex of pronotum, front subvertical, vertex with a transverse impression, tylus prominent, decurved; beak reaching between middle coxæ; antennæ slender, about three-fourths the length of body, the length of joints varying as to species, 3 and 4 more slender than the basal ones; pronotum as in generic key, its basal half strongly gibbous, usually with a distinct median and shorter lateral impression; elytra with margin of embolium visibly curved; cuneus almost horizontal, its fracture scarcely evident. Seven of the nine⁸⁹ known North American species occur in the eastern states.

KEY TO EASTERN SPECIES OF PYCNODERES.

- a. Larger, length 3 or more mm.
- b. Second antennal subequal in length to width of head across eyes; legs pale yellow, the apical third of hind femora alone darker; veins of membrane not distinctly darker than the disk.

⁸⁹Van Duzee (1917, 360) has recorded *Pycnoderes incurvus* (Dist.), a Guatemalan and West Indian species, from the "S. St." The only mention of its occurrence in this country which I can find, and probably the one on which Van Duzee based his record, is that of Uhler in his "Hemiptera of Grenada" (1894a, 193), where he says, after his notes of its occurrence in Grenada: "In the southern United States it lives in midsummer on low herbs in open places on sandy beaches of streams." Distant's species is very close to, if not a synonym of, *P. quadrimaculatus* and Uhler, in making the above statement, probably confused the two.

- c. Embolium with a distinct apical or subapical pale spot; costal margin of elytra feebly curved; pronotum thickly pubescent; length, 3.2 mm. 953. QUADRIMACULATUS.
- cc. Embolium with subapical pale spot very small or wanting; costal margin of elytra strongly curved; pronotum with pubescence scarcely evident; length, 3.5—4 mm. 954. DILATATUS.
- bb. Second antennal distinctly longer than width of head across eyes; all the femora in part or wholly blackish-brown; veins of membrane dark brown or blackish.
- d. Joint 2 of antennæ wholly pale; tibiæ pale brown; length, 3—3.8 mm. 955. CONVEXICOLLIS.
- dd. Joint 2 of antennæ with apical half fuscous; tibiæ pale to yellowish; length, 4 mm. 956. INFUSCATUS.
- aa. Smaller, length less than 3 mm.; second antennal shorter than width of head across eyes.
- e. Pronotal disk evenly arched without median sulcus; embolium with pale spot only at apex. 957. BALLI.
- ee. Pronotal disk bilobed by a median sulcus; embolium with distinct pale spot only at base.
- f. Scutellum convex; mesoscutum not exposed; cell of membrane without a pale spot. 958. MEDIUS.
- ff. Scutellum much flatter; mesoscutum exposed; cell of membrane with a large clear spot on apical half near cuneus. 959. DRAKEI.

953 (1078). *PYCNODERES QUADRIMACULATUS* Guerin, 1857, 169.

Oblong-oval. Head dull yellow, vertex and front with three narrow black lines; pronotum and scutellum black, shining, rather thickly clothed with fine prostrate grayish hairs; clavus and corium black, the latter sometimes brown, both thinly covered with a bluish bloom; corium with an elongate subbasal spot and a smaller apical or subapical one pale yellow; cuneus and membrane pale translucent, the inner basal angles of both darker. Antennæ pale yellow, joint 1 slightly shorter than width of vertex, about one-half the length of 2; 3 and 4 fuscous. Pronotum shorter with hind portion more convex, its median groove deeper and longer than in *dilatatus*; basal margin emarginate at middle. Embolium narrower, and costal margin less rounded than in *dilatatus*. Length, 3—3.2 mm.

Phoenix, Ariz. (*Gerhard*). A neotropical species described from Cuba recorded from Biscayne Bay, Fla., and ranging southwest and south to Arizona, California, Mexico and the West Indies. Recorded by Van Duzee (1917) from New Hampshire and Massachusetts, but not included in Parshley's "Hemiptera of New England."

954 (1079). *PYCNODERES DILATATUS* Reuter, 1909, 3.

Larger and more broadly oval than *quadrifasciatus*. Color much the same, the apical pale spot of embolium very small or wanting; pubes-

cence of pronotum much less distinct, very fine or wanting; apical dark portion of hind femora longer and a deeper black. Pronotum longer, the gibbosity of hind lobe with sides more sloping and base more abruptly declivent; basal margin straight. Costal margin distinctly more rounded and less reflexed than in *dilatatus*; embolium wider, its upper surface transversely rugose. Length, 3.5—4 mm.

Washington, D. C., June 19—Nov. 2 (*Davis and Gerhard*).
Wilmington, N. Car., Aug. 16 (*Brimley*). Recorded only from
New Jersey, Maryland and District of Columbia.

955 (—). *PYCNODERES CONVEXICOLLIS* Blatchley, 1926, 166.

Male—Elongate-oval. Head in great part fuscous, cheeks and a stripe each side of vertex dull yellow; pronotum and scutellum shining black with a faint brassy tinge, very sparsely pubescent with fine prostrate hairs; elytra opaque with a bluish bloom covering most of the surface; cuneus, a large oblong spot near base of embolium and a smaller oval one near its apex, pale yellow; apical half of membrane dusky yellow, its veins and a spot at base dark brown; femora dark brown to blackish, paler at base, tibiae pale brown, yellowish toward tips, coxæ and tarsi yellowish, claws fuscous; under surface black, sterna coarsely punctate, ventrals shining, almost smooth, minutely pubescent. Joints 1 and 2 of antennæ pale yellow, 1 three-fourths as long as width of vertex, 2 nearly three times as long as 1, 3 and 4 dusky, subequal in length, each about as long as 2. Pronotum with sides and base subequal in length, calli larger and much more prominent, median groove of basal half deeper and lateral impressions better defined than in either of the preceding species; hind margin almost straight, feebly notched at middle. Embolium slightly narrower with margin less curved than in *dilatatus* and with only a trace of the transverse rugæ of that species; membrane surpassing abdomen by two-thirds its length. *Female*—Shorter and more broadly oval than male; color much the same. Gibbosity of pronotum higher, with median groove distinctly deeper, the sides and base more abruptly declivent and lateral impressions better defined. Elytra distinctly shorter; embolium slightly wider and more reflexed, its margin more strongly curved; membrane surpassing abdomen by less than one-third its length. Length, male, 3.5—3.8 mm.; female, 3—3.2 mm. (Fig. 185).

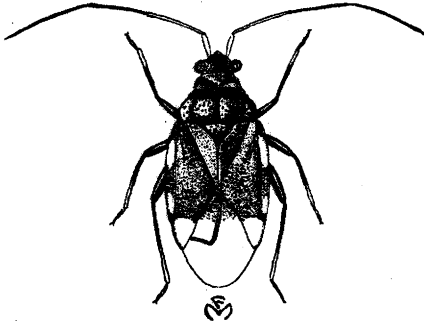


Fig. 185. Male X 9. (Original).

Marion, Putnam, Knox and Posey counties, Ind., April 26—
Sept. 19; swept in numbers from low herbage in dense upland
woods and in thickets along the banks of streams.

956 (—). PYCNODERES INFUSCATUS Knight, 1926c, 104.

Black; membrane fuscous-brown, veins and basal area paler; legs pale to yellowish, femora and front coxæ blackish, bases of femora pale. Joint 1 of antennæ pale, one-eighth shorter than width of vertex, 2 two and one-third times longer than 1. "Pronotum with disk more broadly gibbous than in *dilatatus*, the median line not so deeply impressed. Scutellum with apex more flattened and base more sharply convex." Length, 4 mm.

Known only from the Black Mountains, N. Car.

957 (—). PYCNODERES BALLI Knight, 1926c, 104.

Black; cuneus pale yellowish translucent, narrowly black on basal angle; membrane pale, veins and basal half of cell fuscous; legs pale, hind femora blackish on apical two-fifths, tarsi and apical third of tibiæ yellowish. Antennæ pale, joint 1 two-thirds as long as width of vertex, 2 nearly twice as long as 1. Embolium of nearly equal width throughout, its outer edge thickened. Length, 2.5 mm.

Known only from Sanford, Fla., where it was taken April 9—Aug. 30 by E. D. Ball. A var. *obscuratus* with antennæ and legs chiefly blackish was described by Knight (loc. cit.) from Philadelphia, Pa.

958 (—). PYCNODERES MEDIUS Knight, 1926c, 105.

Punctuation, pubescence and coloration nearly as in *dilatatus* Reut., apical pale spot on embolium nearly obsolete; membrane and veins distinctly fuscous; legs pale, front coxæ and apical half of femora fuscous to blackish. Antennæ pale, joint 4 fuscous. Length, 2.8—2.9 mm.

Described from Hollister, Mo.; Clarksville, Tenn., and Leland, Miss. "Allied to *dilatatus*, but differs in the smaller size, fuscous membrane and broader, more heavily gibbous bilobed pronotal disk." (Knight).

959 (—). PYCNODERES DRAKEI Knight, 1926c, 106.

Closely allied to *medius*. Head yellowish-brown, vertex, median line on front and convex portion of tylus, blackish; embolium with large pale spot on basal half; membrane uniformly dark fuscous, with clear spot as in key. Embolium broader than in *medius*, its edge sharp. Length, 2.9 mm.

Described from a single female taken June 26 at Aberdeen, Miss.

IV. SIXENOTUS Reuter, 1876, 77.

Short, oval, shining species having the head wider across eyes than apex of pronotum, front subvertical, vertex wide, with an oblong median impression; beak reaching middle coxæ;

antennæ pilose, three-fourths the length of body, joint 1 stoutest, usually not reaching tip of tylus, 2 feebly thickened toward apex, 3 and 4 more slender; pronotum with base more than twice as wide as apex, sides feebly sinuate, calli very small, disk behind them strongly convex, coarsely and densely punctate, hind margin with sides rounded, middle sinuate; scutellum small, partly concealed by pronotum, punctate at base, smoother toward apex; elytra entire, impunctate, somewhat scabrous, costal margin feebly broadly curved, cuneus declivent. Six species are known from the eastern states.

KEY TO EASTERN SPECIES OF SIXENOTUS.

- a. Femora not wholly black; elytra usually finely and indistinctly pubescent.
 - b. Cuneus white, embolium pale yellow; basal joint of antennæ slightly longer than width of vertex; length, 2.4—2.6 mm. 960. GRACILIS.
 - bb. Cuneus and embolium black; basal joint of antennæ distinctly shorter than width of vertex.
 - c. Antennæ and legs wholly milky-white, tarsal claws alone darker. 961. ALBICORNIS.
 - cc. Antennæ in part black or fuscous, sometimes wholly so.
 - d. Membrane not abbreviated; legs dull yellow, more or less tinged with fuscous, middle and hind tibiæ with two vague brownish rings. 962. INSIGNIS.
 - dd. Membrane abbreviated, extending beyond cuneus only for a space equal to its length; legs wholly pale yellow. 963. BREVIS.
 - aa. Femora wholly black, trochanters and tarsi pale; elytra coarsely, distinctly pubescent.
 - e. Basal half or more of scutellum concealed; pubescence brownish. 964. TENEBROSUS.
 - ee. Scutellum wholly exposed; pubescence whitish. 965. ALBOHIRTUS.

960 (—). *SIXENOTUS GRACILIS* Blatchley, 1926, 168.

Oblong-oval. Head, pronotum, scutellum and under surface black, distinctly bronzed; joints 1 and 2 of antennæ, embolium and legs yellow; cuneus, membrane and dilated apex of embolium white; veins of membrane and joints 3 and 4 of antennæ fuscous-brown. Eyes larger and vertex narrower than in the other species. Joint 1 of antennæ relatively stout, cylindrical, three-fifths the length of 2; 3 and 4 more slender, subequal, each slightly longer than 2. Pronotum with basal lobe narrower, more convex, more finely and densely punctate than in the others, the basal margin broadly rounded or subtruncate. Elytra and ventrals sparsely clothed with minute golden yellow hairs. Length, 2.4—2.6 mm.

Ft. Myers and Hillsboro Canal, Fla., March 4—24. The type was sifted from the debris on the mucky bottom of an extinct

wet weather pond at Ft. Myers. Easily known by its small size and pale embolium and cuneus.

961 (—). *SIXENOTUS ALBICORNIS* Blatchley, 1926, 167.

Closely allied to *insignis*. Form more elongate, sides more sub-parallel. Head, pronotum and scutellum shining black, devoid of the faint subaneous tinge of *insignis*; elytra piceous-brown, opaque, sub-translucent; membrane with apical half nearly white, cells dark fuscous, veins almost black; under surface shining black; antennæ and legs wholly milky white or a very pale yellow. Joint 1 of antennæ reaching apical fourth of tylus, 2 twice as long as 1, 3 two-thirds as long as 2, 4 nearly twice the length of 3. Pronotum longer and more narrowed in front than in *insignis*, its disk more distinctly obliquely strigose with rows of punctures between the strigæ, the punctures coarser and less dense than in *insignis*. Length, 3.3—3.5 mm.

Palmdale, Moore Haven, R. P. Park and Dunedin, Fla., Nov. 19—April 23 (*W. S. B.*). Everglade, Fla., April 11 (*Davis*). Mobile, Ala., Sept. 8 (*Gerhard*). Frequent about Dunedin, hibernating beneath boards and between basal leaves of sedges, and in spring swept from herbage along the margins of wet hammocks. Taken also at porch light and on flowers of holly.

962 (1074). *SIXENOTUS INSIGNIS* Reuter, 1876, 78.

Oblong-oval. Head, pronotum, scutellum and under surface shining black with a tinge of bronze; elytra black, opaque, minutely and very sparsely pubescent; membrane with apical half pale, cells and veins fuscous; legs as in key, tips of tarsi fuscous; antennæ pale yellow, extreme base of joint 1 and the outer joints dusky. Clavus and cuneus finely scabrous; corium smooth, feebly translucent toward apex. Length, 3.3—3.5 mm.

Plummer's Island, Md., Aug. 29 (*Gerhard*). Texas (*Davis*). Recorded from seven stations in Florida by Barber, but these records probably refer, at least in part, to *albicornis*. Ranges from New England and New York southwest in the coastwise states to Texas. Recorded also from Colorado and Arizona. It occurs in the north on skunk cabbage, *Spathyema fetida* (L.).

963 (—). *SIXENOTUS BREVIS* Knight, 1926c, 107.

Black; clothed with erect pale yellowish pubescence; membrane pale fuscous, veins black. Antennæ black, finely pale pubescent, joint 1 less than half as long as width of vertex, 2 twice the length of 1. Pronotum with front half strongly flattened, sides sinuate. Length, 2.3 mm.

Known only from Hattiesburg, Miss. "Distinguished from *tenebrosus* by the flatter and more elongate pronotum, broadly exposed scutellum, abbreviated membrane and pale yellowish legs." (*Knight*).

964 (1075). *SIXENOTUS TENEBROSUS* (Distant), 1893, 441.

Oblong-oval, male, more broadly oval, female. Head, pronotum, scutellum and under surface black, strongly shining, with a faint bronze lustre; elytra brownish-black, subopaque, rather thickly clothed with conspicuous subprostrate yellowish hairs; membrane pale to fuscous-brown, the cells and veins darker; legs fuscous-brown to black, the coxæ, tarsi and sometimes the tibiæ dull yellow. Joints 1 and 2 of antennæ dark brown to black, 1 scarcely one-half as long as width of vertex, 2 twice as long as 1, 3 and 4 fuscous-brown, each slightly longer than 2. Length, 2.8—3 mm.

Dunedin, Fla., Oct. 25—April 6. Swept from herbage about the margin of ponds (*W. S. B.*). Rock Creek, D. C., June 26 (*Gerhard*). Described from Guatemala. Recorded in this country from Clearwater, Bellaire and La Belle, Fla., Maryland and Kansas.

965 (—). *SIXENOTUS ALBOHIRTUS* Knight, 1926c, 107.

More elongate than *tenebrosus*. Black, thinly clothed with prominent suberect white pubescent hairs; membrane dark fuscous, slightly paler at middle, veins black, finely pubescent; legs as in *aa.* of key. Joints 1 and 2 of antennæ dark brown to black, 1 one-half as long as width of vertex, 2 almost twice the length of 1, 3 two-thirds as long as 2. Pronotum more elongate and not so wide as in *tenebrosus*. Length, 2.6—2.8 mm.

Dunedin, Fla., Oct. 26; swept from a low huckleberry. Described from Sanford, Fla., and not recorded elsewhere.

V. *MONALOCORIS* Dahlbom, 1850, 209.

Small oval brownish species having the head wider across eyes than long; beak reaching hind coxæ; antennæ about two-thirds as long as body, the outer joints more slender than the basal ones; pronotum short, trapezoidal, one and a half times as broad at base as long; disk convex, with calli and collar distinct; elytra entire, passing tip of abdomen, clavus deflected to corium, cuneus short, triangular, feebly deflexed, the outer edge incurved so as to appear notched at base; hind tarsi with joint 3 longest, 1 and 2 subequal. One widely distributed species is known.

966 (1082). *MONALOCORIS FILICIS* (Linnæus), 1758, 443.

Oblong-oval, male, more broadly oval, female. Pale brownish-yellow to dark brown, sparsely clothed with fine prostrate yellow hairs; clavus usually somewhat darker than corium; membrane pale translucent with a faint dusky tinge, the veins and cells slightly darker; legs and beak yellow. Joints 1 and 2 of antennæ yellow, the tip of 2 piceous; 1 about three-fourths as long as width of vertex, 2 feebly thickened toward tip, two and a half times longer than 1; 3 and 4 filiform, piceous, the base

of 3 paler, united one-third longer than 2. Head smooth, polished. Pronotum finely, rather sparsely, somewhat unevenly punctate; scutellum and clavus finely transversely wrinkled. Length, 2.3—2.7 mm.

Porter and Marion counties, Ind., Aug. 22—Sept. 12. Istokpoga, R. P. Park, Ft. Myers and Dunedin, Fla., Nov. 17—April 14 (*W. S. B.*). Hessville and Mineral Springs, Ind., July 24—Sept. 4 (*Gerhard*). Scarce in Indiana. Frequent at R. P. Park and Dunedin, Fla., on *Pteridium aquilinum* (L.) and other ferns in and about the margins of moist dense hammocks. A European species ranging in this country from Quebec and New England west to Wisconsin and British Columbia and south to Florida, Texas and Mexico. As the specific name indicates, it occurs mainly on ferns, though often swept from other vegetation about the margins of ponds, and in Florida hibernating beneath boards and piles of weed debris in moist places. The color varies to some extent, northern specimens being darker brown than those from the south, with the basal angles of pronotum pale.

VI. SYSINAS Distant, 1883, 248.

Elongate-oblong, shining species having the head broad at base, narrowed in front, inserted in thorax to eyes, vertex declivent behind; beak but slightly surpassing front coxæ; joint 1 of antennæ reaching or slightly passing tip of tylus, 2 subequal in length to width of head, 3 and 4 more slender; pronotum subcampanulate, base about three-fourths wider than apex, sides sinuate near middle, calli prominent, convex, oblique, basal lobe convex, finely and densely punctate, its hind margin broadly rounded; scutellum flat, rugose, its base with a median triangular impression; elytra entire, slightly surpassing abdomen, sides parallel. One species has been recorded from the eastern states.

967 (1083). SYSINAS LINEARIS Distant, 1883, 248.

Elongate-oval. Head yellow, base of tylus and median stripe on vertex piceous; pronotum with collar and hind lobe orange-red, calli yellow, percurrent median line blackish; scutellum and elytra dull black; membrane fuscous-brown, its tip paler; coxæ and femora yellow, the apical halves of latter blackish above; tibiæ and tarsi fuscous-brown. Antennæ with joint 1 black; 2 piceous, paler at base; 3 and 4 fuscous. Eyes prominent, sessile, projected their full length beyond sides of collar of pronotum. Scutellum and elytra, except membrane, finely and densely rugose-punctate, each puncture bearing a minute grayish-yellow appressed hair; costal margin narrowly reflexed. Length, 5.5—6 mm.

Sea Cliff, N. Y. (*Banks*). Perhaps adventive, as it was described from Mexico and is not recorded elsewhere.

Subfamily V. CLIVINEMINÆ Reuter, 1876, 62.

Elongate-oval species having the head, pronotum and scutellum thickly clothed with matted pubescence; loræ very narrow; pronotum trapezoidal, its apical half without a collar, but hood-like as described in subfamily key, p. 663, its sides, in our species, carinate their full length; elytra entire, membrane two-celled, the smaller cell narrow; legs short, stout, tibiæ beset with numerous close-set hairs, without spines or setæ, arolia wanting. The subfamily is represented in North America by but two genera, one in the eastern states.

I. LARGIDEA Van Duzee, 1912a, 480.

Head short, nearly vertical; vertex without a basal carina; beak slightly passing middle coxæ; pronotum coarsely and densely punctured, one-half wider at base than long, base nearly twice as wide as apex, its margin broadly rounded above base of scutellum; elytra finely, shallowly punctate; basal joint of tarsi nearly as long as the others united, widened and flattened beneath (pl. X, fig. 27). Five species are known, four occurring in the western states, the other in our territory.

968 (1089%). LARGIDEA DAVISI Knight, 1917b, 7.

Elongate-oval. Color a nearly uniform dark red, thickly clothed with fine prostrate gray hairs; head and transverse groove of pronotum blackish; membrane pale dusky brown, the veins darker; sterna and sides of abdomen tinged with blackish. Antennæ with joints 1 and 2 robust, 1 darker and stouter than the others, only about two-fifths as long as width of vertex; 2 as long as width of head across eyes, almost linear, male, strongly thickened toward apex, female; 3 and 4 very short, subequal in length, each slightly longer than 1, 4 much thinner than the others. Calli outlined or bordered in front and behind by impressed lines which merge and extend downward on sides to the coxal cleft. Length, 6—6.3 mm.

Promised Land, Long Island, N. Y., Sept. 24 (*Davis*). Recorded only from that, the type station, and from Hyannis Port, Mass. Occurs on pine.

Subfamily VI. CYLAPINÆ Poppius, 1909, 1.

This subfamily, as characterized in the key, p. 663, comprises species of variable form and size in which the pronotum is constricted to form a distinct apical collar or with a flattened

anterior margin resembling a collar; legs long and very slender, arolia wanting. Representatives of four genera of the subfamily have been recorded from the eastern states.

KEY TO GENERA OF SUBFAMILY CYLAPINÆ.

- a. Membrane not pilose above and beneath.
 - b. Antennæ long and slender, much longer than body; head short, vertical; vertex with a deep longitudinal impression; sides of pronotum not margined. I. CYLAPUS, p. 877.
 - bb. Antennæ not longer than the body; head declivent; vertex without a median impression; sides of pronotum margined, at least on basal half.
 - c. Form elongate; costal margins subparallel; sides of pronotum concavely arcuate; tarsi, as in other Mirids, 3-jointed. II. FULVIUS, p. 878.
 - cc. Form broadly oval; costal margins strongly curved; sides of pronotum not concavely arcuate; tarsi abnormal, only 2-jointed. III. PERITROPIS, p. 880.
- aa. Membrane very finely pilose both above and beneath; form oblong-oval; entire upper surface of body pilose. IV. BOTHYNOTUS, p. 881.

I. CYLAPUS Say, 1832, 26; I, 347.

In addition to characters above given, this genus has the eyes very large, protuberant, oblique; antennæ inserted above the base of tylus by a distance equal to length of tylus, their basal joint thickened, fusiform, the others filiform; pronotum with collar very narrow, calli short, not reaching the middle of disk; basal joint of tarsi as long as the others united. One species occurs in our territory.

969 (1090). CYLAPUS TENUICORNIS Say, 1832, 26; I, 347.

Elongate-oval. Dark brown, subopaque; lower front of head, a spot behind apical angles and median carina on basal half of pronotum, a spot each side of base and tip of scutellum, an oblique submarginal ray near middle of corium, apex of embolium and narrow inner margin of cuneus, pale yellow; membrane dusky translucent, a bar across middle and apex of cells paler, base of cells and veins darker; legs pale brown, apical half of tibiæ with one, of femora with two pale rings; gula, prosternum and osteolar duct pale yellow; remainder of under surface dark chestnut brown, shining, the ventrals thinly clothed with yellowish hairs. Joint 1 of antennæ dark brown, paler at base, visibly curved, as long as width of head across eyes; 2 very slender, pale brown, extreme tip yellow, three times as long as 1; 3 and 4 more slender, pale to dark brown, 3 slightly longer than 2, 4 one-half the length of 3. Pronotum with calli prominent, minutely punctate, separated by a narrow deep groove; disk behind them short, wide, subdepressed, densely punctate and with a low median carina. Scutellum, clavus and corium finely and densely punctate. Length, 6—7 mm.

Richmond, N. Y., Aug. 4 (*Davis*). Described from Posey Co., Ind. The known range is from Ontario and New England west to Indiana and south to Maryland. Occurs on fungus covered logs and dead trees. Very rapid in its movements, difficult to capture and scarce in collections.

II. FULVIUS Stal, 1862, 322.

Elongate or oblong, rather slender brownish species, having the head porrect, subconical, longer than wide, its front prolonged in front of eyes, horizontal or feebly declivent; beak reaching or surpassing third ventral; pronotum sub-trapezoidal slightly narrower at base than long, calli large, reaching middle of disk, separated by a short longitudinal groove, hind angles prominent, prolonged backward, basal margin concave, not covering mesoscutum; elytra usually entire and slightly passing tip of abdomen, cuneus horizontal; tibiæ and tarsi very slender, the former without spines, the latter with basal joint but little shorter than the others united. Three species have been recorded from the eastern states. They occur usually on fungous-covered dead trees or logs.

KEY TO EASTERN SPECIES OF FULVIUS.

- a. Second antennal in part or wholly pale.
- b. Second antennal wholly pale yellowish; scutellum with a spot each side of middle and apex pale. 970. BRUNNEUS.
- bb. Second antennal with apical third or less pale; scutellum fuscous-black or brown. 971. IMBECILIS.
- aa. Second antennal wholly black. 972. ATRATUS.

970 (1091). FULVIUS BRUNNEUS (*Provancher*), 1872, 104.

Oblong-oval. Head, pronotum, apical third of elytra, femora and under surface dark chestnut-brown; basal two-thirds of elytra, beak, tibiæ and tarsi dull yellow; basal half or outer basal angle of cuneus pale yellow. Joint 1 of antennæ one-half longer than width of head across eyes, dark brown, its extreme apex pale, tinged with reddish; 2 more than twice as long as 1, dull yellow; 3 and 4 fuscous-brown, united subequal in length to 2. Pronotum about one-fourth narrower at base than long, calli less prominent with impression between them more shallow than in *imbecilis*, basal angles more prolonged backward than there. Elytra slightly surpassing abdomen, male; a little shorter than abdomen with cuneus and membrane very small and tips broadly rounded, female. Length, 3.2—3.4 mm.

Marion Co., Ind., July 18 (*W. S. B.*). Willow Springs and Pullman, Ill., July 13—Oct. 27 (*Gerhard*). Ranges from Quebec

and New England west to the Pacific; not recorded in the east south of Maryland. Uhler, after the original description of his *Pamerochoris anthocoroides* (1877, 425), a synonym of *F. brunneus*, says: "This is the most interesting Heteropter which has as yet been found in North America. While being an undoubted Phytocorid (Mirid) in its details of higher group value it yet presents the features and some of the characters of both the Lygæidæ and Anthocoridæ." He later states (1894, 247) that it occurs in the West Indies, Central America and Mexico.

971 (1092). *FULVIUS IMBECILIS* (Say), 1832, 25; I, 345.

Elongate, sides subparallel. Head, pronotum and scutellum dark brown; elytra paler brown, a premedian oblique yellowish spot across corium and a pale yellow calloused spot on basal half of cuneus; membrane pale brownish-translucent, feebly iridescent; legs and under surface in great part pale brownish; coxæ, knees, middle of beak, tarsi, tips of tibiæ and base of ventrals, dull yellow. Joint 1 of antennæ reddish-brown, as long as head; 2 with basal two-thirds or more dark brown, remainder pale yellow; 3 and 4 fuscous-brown. Pronotum much as in *brunneus*, the calli more prominent, impression between them deeper, hind angles less prolonged, basal margin more shallowly concave. Elytra slightly surpassing abdomen, male, reaching its tip, female. Length, 4—4.5 mm.

Marion, Vigo, Knox and Lawrence counties, Ind., Aug. 6—Oct. 16 (*W. S. B.*). Raleigh, N. Car., Sept. 11 (*Brimley*). Taken from dry fungi about the base of stumps; also in late autumn from beneath logs and other cover in moist woodland. Described from Indiana. The known range extends from New Jersey west to Michigan and Indiana and southwest to North Carolina. Easily known from *brunneus* by the longer first antennal, wholly dark scutellum and paler femora. The pale spot on cuneus is often in part margined with red.

972 (1093). *FULVIUS ATRATUS* Distant, 1884, 282.

Elongate-oval. Black; basal third of corium with a transverse whitish bar, terminating inwardly at middle of outer claval margin; cuneus pale brownish-yellow, its tip and inner basal angle black; membrane blackish, its apical half pale fuscous; femora brownish-yellow, their bases piceous; tibiæ pale fuscous, tarsi dull yellow. Joint 1 of antennæ dull brownish-yellow, its base piceous; 2 black, 3 and 4 fuscous. Length, 4 mm.

A neotropical species, described from Guatemala and taken at Biscayne Bay, Fla., by Mrs. Slosson, that being the only definite station record for this country.

III. PERITROPIS Uhler, 1891, 121.

Oval or subelliptical species having the head porrect, narrowed and conical in front of eyes, vertex convex with an impressed line on middle, tylus prominent, its base on a line with that of antennæ; beak reaching or surpassing fourth ventral; antennæ half the length of body, joint 1 stoutest, subequal in length to width of vertex, 2 about as long as head and pronotum united, 3 and 4 short and slender, united about three-fifths the length of 2; pronotum twice as wide at base as long, almost flat, feebly declivent from the base forward, calli rounded, convex, placed near middle of disk; scutellum large, equilateral; mesoscutum convex, widely exposed; elytra entire, thick, opaque, cuneus small, its fracture feeble, embolium broad, flattened, membrane large, uniformly fuscous; legs short, femora stout, compressed, subfusiform; tibiæ very slender.

As pointed out by McAtee & Malloch (1924, 71) *Peritropis* is an aberrant genus in that the tarsi are 2-jointed instead of 3-jointed as in other Mirids. They regard it, therefore, as an "annectant" or connecting link between the families Miridæ and Isometopidæ. The absence of ocelli and the two closed cells of membrane denote, however, that it is a true Mirid. Two of the three known species occur in the eastern states.

KEY TO EASTERN SPECIES OF PERITROPIS.

- a. Hind margin of pronotum sinuate and with three small white tubercles; corium fuscous with faint pale dots along the costal margin. 973. SALDÆFORMIS.
- aa. Hind margin of pronotum almost straight, without tubercles; corium blackish-brown flecked with numerous gray dots. 974. HUSSEYI.
- 973 (1094). PERITROPIS SALDÆFORMIS Uhler, 1891, 122.

Broadly ovate. Dark brown or blackish-fuscous, very sparsely pubescent; head brownish-yellow, sides and vertex marked with fuscous; joints 1 and 2 of antennæ blackish-brown, 2 paler at base, 3 and 4 pale brown; pronotum brownish-yellow, an angular spot each side of calli and a smaller one between them, blackish; side margins with small black dots, hind one with three small white tubercles; elytra blackish-brown, embolium dull brownish-yellow, costal margin with small white dots, cuneus with base and inner margin pale; membrane pale fuscous; legs blackish, base and tips of femora pale; tibiæ with two testaceous rings. Structural characters as under genus heading. Length, 2.7—3 mm.

Recorded from Maryland, District of Columbia, northern Illinois and Texas. Occurs on dead branches of trees.

974 (—). *PERITROPIS HUSSEYI* Knight, 1923c, 50.

Rather broadly oval. Fuscous-brown or blackish thickly mottled above with small pale dots, these in places confluent to form small pale spots; scutellum black, the apical fourth and a few scattered dots pale; cuneus black with a few pale dots near base; membrane fuscous, the veins slightly darker; under surface and legs brownish-black, the former sparsely clothed with yellowish hairs, middle and hind tibiæ paler toward tips; joints 1 and 2 of antennæ dark brown to black, 2 with a small submedian pale spot above, 3 and 4 slender, black. Beak reaching middle of sixth ventral. Pronotum with sides straight and converging from base to apex, their margins feebly reflexed; calli small, rounded, separated by a shallow median groove; hind margin broadly concave. Mesoscutum widely exposed, elevated above base of scutellum. Elytra conjointly oval, costal margins broadly curved, narrowly reflexed on basal half, disk with pale dots each bearing a very minute yellowish hair, these visible only when viewed from the side. Length, 3—3.2 mm.

Marion Co., Ind., July 30; one example taken from a pile of cord-wood in dense woodland. Recorded only from near Ann Arbor, Mich., and Tuskegee, Ala. The Indiana specimen has three minute white calloused spots, not tubercles, on the hind margin of pronotum. The Michigan types were taken by Hussey from beneath loose bark of white oak logs. This *Mirid* is distinct from all others at hand by the combination of conical head, flat, regularly trapezoidal pronotum, long beak and very numerous pale dots on a dark background.

IV. *BOTHYNOTUS* Fieber, 1864, 76.

Oblong-oval pubescent species having the head wider across eyes than long, strongly constricted just behind eyes into a short neck, its front vertical, strongly flattened; tylus convex, its base separated from the front; eyes prominent, not contiguous with pronotum; joints 1 and 2 of antennæ stout, of equal thickness, densely pilose, 3 and 4 abruptly much more slender, also pilose; beak reaching middle coxæ; pronotum trapezoidal, declivent forward, disk hairy, twice as wide at base as long, deeply, closely punctate; calli smooth, confluent at middle, forming a smooth, shining arc; mesoscutum concealed; scutellum triangular, minutely transversely wrinkled, deeply impressed at base, a median carina on apical half; elytra sometimes dimorphic, in male, surpassing abdomen, rugose, hairy, cuneus and membrane much deflected; in female sometimes reaching only to fourth dorsal, the membrane absent; legs pilose, hind femora slender, not reaching tip of abdomen; joint 1 of tarsi longest, 2 shortest, claws toothed at base, without arolia. One species is known from our territory.

975 (976½). *BOTHYNOTUS-MODESTUS* (Wirtner), 1917, 34.

Male—Oblong. Fuscous-brown, thickly clothed with short inclined blackish hairs; head, neck and collar dull red; tylus, calli and scutellum piceous; membrane dusky, iridescent, a whitish spot beneath tip of cuneus; legs brownish-yellow; ventrals reddish-brown, their side margins blackish. Joint 1 of antennæ rufous, swollen, slightly longer than width of vertex; 2 cylindrical, rufous at base, piceous toward apex, four-fifths as long as basal width of pronotum; 3 yellowish, 4 dusky, the two united one-fifth shorter than 2. Elytra minutely punctate; membrane longer than basal width of pronotum, rugose, very finely pubescent, both above and below, apex of large cell broadly rounded. *Female*—Oval. Above and beneath black or piceous, strongly shining; legs black or piceous, tibiæ sometimes dull yellow. Joints 1 and 2 of antennæ black or piceous-black; 1 as long as width of vertex, 2 distinctly thickened toward apex, one-fourth shorter than in male. Membrane, brachypterous form, three-fourths as long as basal width of pronotum, slightly passing tip of abdomen. Length, male, 4—5 mm.; brachypterous female, 3.8—4.2 mm.

Dunedin, Fla., Feb. 23—April 16; two females beaten from dense bunches of Spanish moss (*W. S. B.*). Greensburg, Pa., Aug. 16—Sept. 18 (*Wirtner*). Described from there and recorded elsewhere only from Illinois. When compared with specimens of the European *B. pilosus* (Boh.), received from W. E. China, I found the latter to have joints 1 and 2 of antennæ more sparsely and finely pilose and distinctly shorter, 1 being only three-fifths as long as width of vertex, 2 cylindrical in both sexes, about three-fifths as long as basal width of pronotum, 3 and 4 united as long as 2; female with elytra reaching fourth dorsal, membrane absent; legs, except tarsi, reddish-yellow in both sexes. The two species are, in my opinion, very distinct.

Subfamily VII. *DERÆOCORINÆ* Van Duzee, 1915, 114.

Oval or oblong-oval, robust, shining Mirids of medium size having the head small, as wide or wider across eyes than apex of pronotum, its front usually vertical or nearly so; eyes large, prominent; antennæ generally shorter than body, the third and fourth joints usually more slender than the basal ones; pronotum trapezoidal and with a distinct but narrow collar; scutellum large, flat, equilateral; elytra entire, coriaceous, subdepressed, usually surpassing the abdomen, cuneus horizontal or feebly deflexed, its fracture weak; membrane 2-celled; claws usually cleft at base, arolia very slender, bristle-like, pseud-arolia absent.

The subfamily is represented in the eastern states by five of the seven known North American genera.

KEY TO EASTERN GENERA OF SUBFAMILY DERÆOCORINÆ.

- a. Vertex transversely striate and with a longitudinal sulcus; joint 2 of hind tarsi much shorter than either 1 or 3.
 - b. Antennæ linear, of nearly equal thickness throughout, joint 2 scarcely enlarged at apex, 3 and 4 linear. I. EUSTICTUS, p. 883.
 - bb. Joint 2 of antennæ clavate, 3 and 4 short and thick, fusiform.
 - II. DIPLOZONA, p. 887.
- aa. Vertex more or less polished, scarcely striate or sulcate; joints 1 and 2 of hind tarsi subequal.
 - c. Head strongly produced and nearly horizontal, surpassing apex of first antennal; second antennal thick, nearly linear, longer than the other three united; upper surface covered with stiff erect hairs; embolium thin, broadly expanded, sides nearly parallel.
 - III. EURYCHILOPTERELLA, p. 887.
 - cc. Head less produced, scarcely surpassing middle of first antennal; upper surface either pubescent or subglabrous; embolium not as above.
 - d. Pronotum distinctly margined; first antennal surpassing tip of tylus by less than half its length; hind margin of eyes nearly in contact with pronotal collar; scutellum punctate.
 - IV. CAMPTOBROCHIS, p. 888.
 - dd. Pronotum not margined; first antennal surpassing tip of tylus by more than half its length; eyes sloping forward away from collar; scutellum impunctate (except in *D. ruber* Linn.).
 - V. DERÆOCORIS, p. 892.

I. EUSTICTUS Reuter, 1909, 35.

Elongate- or oblong-oval, shining, subglabrous species having the head one-half the width of base of pronotum, its front vertical, transversely strigose, vertex without basal carina; eyes of male usually much larger than those of female; beak reaching first ventral; antennæ as in *b* of key; pronotum one-half or more wider at base than apex, sides straight, basal half convex, declivent forward, shallowly and sparsely punctate, hind margin broadly rounded, calli large, rather low, oblique, occupying most of the apical two-fifths of disk; elytra entire, reaching tip of abdomen, cuneus feebly reflexed, as wide or wider at base than long; legs long, hind femora slender, reaching tip of abdomen, female, slightly surpassing tip, male. Other characters as in key. Six species have been recorded from the eastern states. They have in the past been mostly recorded under the generic names *Megacælum* Fieb. and *Cimatlan* Dist.

KEY TO EASTERN SPECIES OF EUSTICTUS.

- a. Hind tibiæ with long pilose hairs or setæ on basal half, these distinctly longer than true spines.
- b. Pronotal disk uniform brownish-black; legs chiefly reddish-brown; tibiæ not banded with paler; length, 8—10 mm. 976. GROSSUS.
- bb. Pronotal disk with front half blackish, hind one paler; legs pale brownish-yellow with black markings; tibiæ with four alternating pale and fuscous bands. 977. VENATORIOUS.
- aa. Hind tibiæ with only short and fine pubescence.
- c. Pronotum chiefly black, lateral margins not pale; width of vertex in male twice or more the thickness of first antennal.
- d. Coria with a piceous band across the tips; scutellum wholly black; legs uniform reddish-brown. 978. MUNDUS.
- dd. Coria without a piceous band across the tips; scutellum black with spot on basal angles and median stripe on apical half pale; legs more or less spotted with pale. 979. NECOPINUS.
- cc. Pronotum with median portion black, sides broadly pale; width of vertex in male usually but little more than thickness of first antennal.
- d. Smaller, length, 5.5—6 mm.; joint 4 of antennæ shorter than joint 1. 980. CATULUS.
- dd. Larger, length, 7—7.5 mm.; fourth joint of antennæ as long as or longer than joint 1. 981. SALICICOLA.

976 (1054). *EUSTICTUS GROSSUS*^{89a} (Uhler), 1887b, 70.

Head, elytra, antennæ and legs pale reddish- or yellowish-brown; pronotum and scutellum blackish-brown; inner apical angles of corium and cuneus piceous, outer one of corium tinged with reddish; membrane dusky translucent, cells and veins darker; under surface pale brownish-yellow, genital region darker; tibiæ and basal joints of beak usually in part reddish, tarsi dull yellow. Joint 1 of antennæ stout, narrowed at base, about as long as pronotum, beset with numerous long black setæ, similar to those on legs; 2 more slender, cylindrical, two and a half times as long as 1; 3 dull yellow, darker at base, two-fifths the length of 2; 4 fuscous, its tip paler, three-fourths as long as 3. Pronotum one-third wider at base than long, sides feebly sinuate, their pale edges narrowly reflexed; calli larger, united at middle, disk behind them transversely rugose, finely scabrous, indistinctly punctate. Elytra with a row of punctures each side of radial veins, otherwise smooth. Femora and tibiæ all with numerous long erect blackish hairs. Length, 8—10 mm.

Posey Co., Ind., Sept. 21. Miami, R. P. Park, Lake Okeechobee and Dunedin, Fla., Dec. 4—March 20. Beaten from foliage of shrubs along the margins of hammocks. Previously recorded from Crescent City and Biscayne Bay, Fla. Ranges from New England and New York west to southern Indiana and southwest to Florida and Texas. Uhler mentions it as "moderately common on pine bushes in Maryland and Massachusetts in July."

^{89a}China (Ms.) states that, in his opinion, *E. grossus* is the same as *Capsus micronis* Walker (1873, 96), which Van Duzee, following Distant, lists as a *Creontiades*. If so Walker's name has priority.

977 (1050). *EUSTICTUS VENATORIOUS* Van Duzee, 1912a, 479.

Dull brownish-yellow, the upper surface, head, femora and middle and hind tibiæ sparsely clothed with long, suberect brownish hairs; vertex, apical two-thirds of pronotum, scutellum in part, inner apical angle of corium and tips of embolium and cuneus, fuscous-black or brown; basal third of pronotum, clavus and apical halves of femora more or less flecked with fuscous; a spot each side of base and tip of scutellum and the greater part of cuneus pale yellow; membrane fuscous, its veins and cells darker; under surface dull yellow, the genital region darker. Joint 1 of antennæ dark brown, as long as head; 2 yellow, or brown, thickly dotted with fuscous or yellow, more than twice the length of 1; 3 pale yellow, its base with fuscous dots, subequal in length to 1; 4 dark brown, two-thirds as long as 3. Eyes of male very large, narrowly separated above. Pronotum rather finely, irregularly and shallowly punctate. Length, 6.5—8.2 mm.

Cape Sable, Fla., Feb. 23; beaten from foliage along a pathway of a dense hammock. (*W. S. B.*). Lakeland, Fla., May 6 (*Davis*). Recorded also from Key West and Crescent City, Fla. Known elsewhere only from New York. Van Duzee's types, from Hamburg and Gowanda, N. Y., "were beaten from hickory trees over which they were prowling, apparently in search of prey."

978 (1052). *EUSTICTUS MUNDUS* (Uhler), 1887b, 71.

Head, elytra and under surface pale brownish-yellow, in part often heavily tinged with red; eyes, pronotum and scutellum black; embolium pale translucent yellow, its apex red and black; inner basal angles and margins of cuneus and a narrow curved bar across apex of corium piceous; membrane dusky translucent, its veins darker; beak and legs pale yellow, more or less tinged with red; genital segments darker. Eyes of male very large, not contiguous to pronotum. Antennæ with joints of same relative length as in *grossus*, 1—3 dull red, faintly dotted with fuscous, 4 brown, its tip red. Pronotum thickly, rugosely, rather coarsely and shallowly punctate, its collar and very narrow margins reddish-yellow. Scutellum minutely transversely strigose, the disk with a large shallow median impression. Outer margin of clavus and inner one of corium each with two regular rows of fine punctures, elytra otherwise almost smooth. Length, 5.3—6 mm.

Dunedin and Kissimmee, Fla., March 21—June 11; swept from flowers of the coast germander, *Teucrium littorale* Bick., and taken at porch light. Recorded only from Enterprise and Crescent City, Fla., and eastern Georgia.

979 (—). *EUSTICTUS NECOPINUS* Knight, 1923, 481.

Pronotum brownish-black, disk with collar, narrow margins and a few small scattered spots, paler, sometimes, var. *discretus* Knight, wholly

dark; color of scutellum as in key; elytra pale translucent, irregularly marked with dark fuscous; cuneus yellowish sub-hyaline, apical half and inner basal angle blackish; membrane pale, veins and side margins in part brownish to fuscous; legs brownish-black, femora paler at base and spotted apically, tibiæ with pale spots; ventrals dull yellow spotted with reddish. Joint 1 of antennæ pale with black markings, three-fourths as long as width of head across eyes; 2 brownish-black almost three times as long as 1; 3 and 4 black, 3 one-half as long as 2, 4 four-fifths the length of 3. Length, 5.6—7 mm.

Recorded only from Ontario and New York, the var. *discretus* from Connecticut. Occurs on aspen.

980 (1051). *EUSTICTUS CATULUS* (Uhler), 1894, 257.

Dull brownish- or grayish-yellow, clothed with gray pubescence; pronotum with a large subquadrate black spot on apical half, and vaguely spotted with black near base; scutellum shining black, a yellow spot each side at base, tip whitish; corium with small scattered brown spots, a larger blackish one on inner apical angle; cuneus ivory-yellow, its tip and margins black; membrane pale dusky-hyaline, veins and apical half darker; connexivum reddish, incisures blackish; legs dull yellow, vaguely spotted with brown; coxæ and sternum whitish; ventrals greenish-yellow, freckled with red, side margins with a broad black stripe. Joint 1 of antennæ black, 2—4 piceous-brown, 2 as long as clavus, 3 slightly longer than 1, 4 three-fourths as long as 3, its tip acute. Length, 5—6 mm.

Described from York Co., Pa., southern Texas and Cape St. Lucas, Lower California. Occurs on pine.

981 (—). *EUSTICTUS SALICICOLA* Knight, 1923, 482.

Elongate, sides subparallel, male; suboval, female. Color of pronotum as in key; scutellum dark brown or black, basal angles pale; elytra pale translucent, glabrous, clavus black each side of commissure, corium with punctures, radius and a large spot on inner apical angle, dark fuscous, outer edge of embolium often blackish; cuneus pale translucent, inner apical margin darker; membrane pale hyaline, cells dusky, margins of apical half pale fuscous; legs dull yellow, apical half of femora spotted with blackish; tibiæ each with four pale bands and numerous dark spots; ventrals pale greenish-yellow, spotted with reddish. Joint 1 of antennæ pale, flecked with black spots, two-thirds as long as width of head across eyes; 2 dark fuscous, extreme base paler, nearly three times as long as 1; 3 blackish, paler apically, two-fifths as long as 2; 4 blackish, one-fifth shorter than 3. Length, 7—7.5 mm.

New Ulm and St. Paul, Minn., June 18 (*Minn. Univ. Coll.*). Recorded from Mississippi, Minnesota and North Dakota. Occurs on bark of willow.

II. DIPLOZONA Van Duzee, 1915, 112.

Short, oval, subglabrous, strongly punctate species having the head nearly horizontal, slightly exserted; vertex as in *a* of generic key, without a basal carina; eyes large, prominent, widely separated; beak reaching hind coxæ; pronotum trapezoidal, sides feebly sinuate, narrowly margined, collar conspicuous, disk behind calli convex, strongly declivent, hind angles obtusely rounded, basal margin broadly curved; elytra entire, cuneus feebly deflexed, membrane 2-celled, surpassing abdomen by half its length. One species is known.

982 (1055). DIPLOZONA COLLARIS Van Duzee, 1915, 114.

Dull brownish-yellow, glabrous or nearly so; vertex with a vague fuscous blotch enclosing a median pale spot; apical three-fourths of pronotum fuscous, with median line and a spot each side pale; collar and basal fourth of pronotum dull yellow; scutellum blackish, its basal angles and a short median apical stripe pale; clavus and apical half of corium more or less clouded with fuscous; embolium pale yellow, its outer edge with minute fuscous punctures; cuneus hyaline, its tip and that of embolium reddish-brown; membrane with apical third dusky, remainder hyaline, veins darker; legs pale yellow, hind ones with apical third of femora and two rings on tibiæ and their tips, reddish-brown; under surface dull yellow, a stripe on sides and genital plates darker. Antennæ stout, half the length of body, joint 1 piceous-brown, as long as width of body, 2 dull yellow, the clavate apex reddish; 3 and 4 fuscous-brown, fusiform, their bases very narrow. Entire upper surface except head and membrane, rather thickly, coarsely and evenly punctate. Length, 4–5 mm.

Dunedin, Fla., Oct. 25—April 23; taken both on Hog Island and mainland by beating foliage of buttonwood, *Conocarpus erecta* L., and sweeping herbage along the bay front; also at porch light. Described from Punta Gorda and Estero, Fla., and not recorded elsewhere. Easily known from all other members of the subfamily by the peculiar structure of the antennæ.

III. EURYCHLOPTERELLA Reuter, 1909, 59.

Oblong-oval, convex, punctate species having the head porrect, front feebly declivent, eyes not contiguous with pronotum, vertex with base margined; antennæ with joint 1 not reaching tip of tylus, 2 as in key, 3 and 4 united much shorter than 2; pronotum trapezoidal, calli rather large, covering the apical third, disk behind them convex, declivent, sides straight; scutellum subequal in length to commissure, convex; elytra entire, surpassing tip of abdomen, cuneus nearly horizontal; legs short. One species is known.

983 (1056). *EURYPHYLLOPTERELLA LURIDULA* Reuter, 1909, 60.

Dull grayish- or greenish-yellow, very thickly clothed with suberect yellowish hairs; front of head, calli and four oblong-oval spots on basal half of pronotum, scutellum in great part, apical half or more of clavus, inner apical third of corium and cuneus in great part, fuscous-black; embolium and median line of scutellum pale dull yellow; membrane dusky translucent, its veins darker; under surface blackish-brown, shining, gula and prosternum paler; legs greenish-yellow, tinged with fuscous. Beak brown, reaching first ventral. Antennæ half the length of body, thickly pilose, joints 1 and 2 greenish-yellow, 1 about half as long as width of vertex; 2 darker and visibly thickened toward apex, almost four times as long as 1; 3 and 4 fuscous-brown, united two-thirds the length of 2. Head as in *c* of key, the tylus and cheeks convex, prominent. Pronotum two and one-half times as wide at base as apex, disk behind calli convex, thickly, evenly and rather coarsely punctate. Scutellum finely transversely rugose. Elytra, except membrane, very finely, unevenly and shallowly punctate, each puncture bearing an inclined yellowish hair. Length, 4.2—4.5 mm.

Chicago, Ill., Sept. 12; taken from elm (*Gerhard*). Recorded only from New York and District of Columbia, where it is said to occur on yellow-wood, *Cladrastis lutea* (Michx.); also on apple trees and to be evidently predaceous.

IV. CAMPTOBROCHIS⁹⁰ Fieber, 1858, 304.

Small oblong-oval, subconvex, shining species having the upper surface glabrous; eyes almost contiguous with pronotum; vertex carinate at base; scutellum punctate; tarsal claws deeply cleft near base. Male with "left clasper tapering gradually to a point, therefore without a barb or hook at tip as in the species of *Deræocoris*." The adults hibernate and are probably predaceous. Five species are known from the eastern states.

KEY TO EASTERN SPECIES OF CAMPTOBROCHIS.

- a. Upper surface not red and black.
 - b. Cuneus infuscated or with blackish; membrane marked with fuscous.
 - c. Membrane nearly clear, but with a small round submarginal fuscous spot each side on apical half; host plant, bur oak.
984. NEBULOSUS.
- cc. Membrane with apical half infuscated, without distinct spots, but paler near tip of cuneus; disk of pronotum often blackish behind calli, the median line pale; femora piceous, apical half with one or two pale rings; host plants, white and red pines.

985. NUBILUS.

⁹⁰Knight (1921) made this group a subgenus of *Deræocoris*. The characters used by him in separating it as a subgenus are mainly those used in my generic key and are more distinctive than those separating many other genera of Miridæ. I therefore restore the old generic name.

bb. Cuneus red or stained with reddish; membrane hyaline or with only a fuscous spot at apex or a point each side of middle.

d. Second antennal as long or longer than pronotum; membrane fuscous at apex; calli and scutellum in great part fuscous-black; cuneus red; host plants, smooth alder and white pine.

986. PÆCILUS.

dd. Second antennal shorter than pronotum; membrane with two fuscous spots on apical half, sometimes with a brownish cloud behind the spots.

987. ORNATUS.

aa. Upper surface bright red; clavus, two spots on pronotum and two on corium, black.

988. HISTRIO.

984 (1058). CAMPTOBROCHIS NEBULOSUS Uhler, 1872, 417.

Dull greenish-yellow, shining, glabrous; two stripes on head, calli and middle of disk of pronotum behind them, scutellum in great part, apical halves of clavus and corium, and apex of cuneus, black or heavily tinged with blackish; basal angles and apex of scutellum, a small spot each side of basal half of cuneus and the osteolar duct, calloused ivory-white; membrane as in *c* of key; femora dark brown, the knees paler; tibiæ and tarsi dull yellow, the former with two brown rings; propleura dull yellow, coarsely punctate; ventrals shining black, sparsely and minutely pubescent. Joint 1 of antennæ dark brown, almost glabrous, three-fourths as long as width of vertex, 2 brownish-yellow, sometimes fuscous at base and apex, distinctly pubescent, one-fourth longer than pronotum, male, about as long as pronotum, female; 3 and 4 more slender, fuscous, subequal in length. Beak reaching between the middle coxæ. Pronotum one-half wider at base than long, sides straight, narrowly margined; calli large, minutely punctate, remainder of disk coarsely and unevenly punctate, hind margin sinuate. Scutellum nearly flat, its middle third sparsely punctate. Elytra, except membrane, coarsely and rather sparsely punctate. Tarsal claws and arolia as in pl. X, 29. Length, 3.5—4.2 mm.

Frequent throughout Indiana, March 20—Sept. 11. Istokpoga, Fla., March 30. Recorded heretofore definitely only from Monticello, that State. In Indiana and elsewhere in the North it hibernates as imago beneath bark, bunches of dead leaves and other cover. In summer it has been swept from flowers of Jersey tea and foliage of various weeds and, especially in early autumn, often flies to light, four of the specimens at hand having been taken from my desk while at work at night. Ranges from Quebec and New England west to the Pacific and southwest to Florida, Texas and Arizona.

985 (—). CAMPTOBROCHIS NUBILUS (Knight), 1921, 106.

Dull greenish- or grayish-yellow, glabrous or nearly so; vertex with two curved stripes and tylus with two lines black; collum and calli shining black, the latter in female with front margin and a wedge-shaped spot between their front halves yellow; disk of pronotum behind calli with

or without fuscous blotches; scutellum brown, the side margins and tip yellow; narrow edges of embolium and commissure blackish; tibiæ greenish-yellow with two rings and tips darker; coxæ pale, tarsi fuscous; ventrals shining blackish-brown, finely and sparsely pubescent. Antennæ dark brown, middle of joint 2 paler; joint 1 nearly three-fourths as long as width of vertex; 2 almost four times as long as 1, male, three times as long, female; 3 and 4 subequal, each one-third the length of 2. Pronotum two-thirds wider at base than long, sides and basal margin slightly sinuate, disk finely and sparsely punctate. Elytra, including cuneus, similarly punctate; scutellum more coarsely and sparsely so. Length, 4.2—4.8 mm.

Ithaca, N. Y., Feb. 13 (*Davis*). Ranges from Newfoundland and New England west to Minnesota and Nebraska and southwest to North Carolina; hibernating beneath bark and other cover. Probably predaceous on the pine bark aphid, *Chermes pinicorticis* (*Fitch*).

986 (1060a). CAMPTOBROCHIS PÆCILUS McAtee, 1919c, 246.

Pale brownish-yellow, shining, glabrous; head with two stripes on vertex, bent behind at right angles and reaching eyes, piceous; tylus with two narrower similar stripes; pronotum with front margin of calli and wedge-shaped projection between them, collar, very narrow median line of hind lobe and edge of hind margin, yellowish; scutellum with side margins of basal half and apex ivory-white; corium with two spots on apical third dark brown; cuneus bright red, yellowish at base, the margins of apical half brown; membrane as in key; femora with basal two-thirds shining brown, apical third and knees paler; tibiæ dull yellow with two rings and apical fourth brown; tips of beak and tarsi fuscous. Antennæ dark brown, middle third of joint 2 often yellow; joint 1 as long as width of vertex, 2 three and a fourth times longer than 1, 3 one-third the length of 2, 4 slightly longer than 3. Pronotum two-thirds wider at base than long, rather coarsely, evenly, not densely punctate. Scutellum more coarsely and closely punctate. Clavus coarsely, corium more finely and sparsely punctate. Length, 4.2—5 mm.

Swannanoa and Fair Bluff, N. Car., July—Sept. (*Brimley*). Ranges from New England west to Illinois and southwest to North and South Carolina. Described by Reuter (1909, 59) as *Camptobrochis validus cunealis*, but his varietal name was preoccupied. McAtee found the adults hibernating beneath bark of birch, sycamore and maple, near Great Falls, Va. He collected the nymphs in August from *Alnus rugosa*.

987 (—). CAMPTOBROCHIS ORNATUS (*Knight*), 1921, 99.

Head reddish-brown; cheeks, loræ, tip of tylus and two impressed spots on vertex, piceous; pronotum grayish-testaceous, punctate with fuscous, margins and vague median line of disk paler, calli black, their margins reddish-brown; scutellum reddish-brown to piceous, apex and side

margins ivory-white; mesoscutum black, narrowly or not at all exposed; elytra grayish-yellow subtranslucent, narrow area each side of commissure, spot on middle and narrow apical margin of corium, piceous; cuneus reddish-translucent, outer margin yellowish, narrowly piceous on apical half of inner margin; membrane as in key; femora reddish-brown, basal half piceous; tibiæ dull yellow, two rings and apical fourth reddish or piceous; sternum fuscous, opaque; ventrals dark red to piceous, shining. Joint 1 of antennæ reddish-brown, darker apically, one-third as long as width of head across eyes; 2 brown, vaguely reddish at middle, slightly shorter than length of pronotum; 3 and 4 dark brown with pale pubescence, subequal in length, each as long as width of vertex. Beak reaching between middle coxæ. Length, 4.5—4.8 mm.

Bigelow, Mo., Aug. 28 (*Barber*). Recorded from Illinois, Missouri, Nebraska and South Dakota.

988 (1063). CAMPTOBROCHIS HISTRIO (Reuter), 1876, 75.

Head, two large spots on pronotum, basal two-thirds of clavus, a triangle at base and a large round spot each side on apical third of corium and tip of cuneus shining black; basal carina of vertex and collar yellow; membrane dusky, translucent, the cells and veins darker; remainder of upper surface bright red or greenish-yellow strongly tinged with red; legs and under surface black, shining, tibiæ each with two pale rings, tarsi and beak fuscous-brown. Joint 1 of antennæ black, subglabrous, as long as width of vertex; 2—4 fuscous-brown to blackish, distinctly pubescent; 2 thickened toward apex, nearly three times as long as 1; 4 slightly longer than 3, the two united four-fifths as long as 2. Pronotum two-thirds wider at base than long, sides nearly straight, strongly converging from the base; apex three-fifths as wide as base; disk convex, coarsely and rather sparsely punctate, humeral angles obtusely rounded, basal margin feebly sinuate. Scutellum coarsely, sparsely punctate. Elytra evenly, rather thickly and coarsely punctate. Length, 4.6—5.2 mm.

Occurs throughout Indiana but apparently scarce. Found throughout the year. Two specimens were taken in Vigo Co., Feb. 23, 1893, from beneath the close fitting bark of a black oak (*Quercus velutina* Lam.) log which lay on the side of a high sandy hill near the Wabash River. Eight others were taken Oct. 13, 1899, from beneath the bark of a gray pine, *Pinus divaricata* (Ait.) on the top of a high sand dune near Millers, Lake Co., Ind. It is therefore seen to be gregarious while hibernating. In summer it has been taken singly or in pairs in Marion and Knox counties, by sweeping along the margins of ponds and marshes. Ranges from New York west to Minnesota, Montana and California. Not recorded in the east south of Maryland except by Reuter from "Texas and Carolina." That author founded for *histrion* (loc. cit.) the genus *Callicapsus* which he

afterward (1909, 58) merged with *Camptobrochis*. It was retained by Van Duzee as a subgenus of *Camptobrochis*.

V. DERÆOCORIS Kirschbaum, 1855, 191, 208.

Oval or oblong-oval, rather robust, usually subglabrous species, having the head short, broader than long, subporrect, wider across eyes than apex of pronotum, vertex margined behind; eyes large, widely separated; beak reaching upon or slightly passing middle coxæ, rarely (*grandis*) reaching second ventral; antennæ inserted slightly above the lower margin of eyes, almost half the length of body, the joints variable in length as to species; pronotum trapezoidal, collar narrow but distinct, disk rather coarsely punctate, wider at base than long, sides usually straight, calli oval, smooth, shining; scutellum triangular, nearly equilateral; elytra entire, surpassing tip of abdomen, usually more elongate in males, cuneus rather strongly deflexed, fracture deep; legs rather long, hind femora moderately swollen, tibiæ beset with prominent hairs, the middle and hind ones usually also with one or two rows of spines. The genus is a very large one and has a world-wide distribution. Knight in his monograph (1921) stated that in the genus *Deræocoris*, as recognized by him, there now belong 146 species and 62 varieties. Of these (exclusive of the genus *Camptobrochis*, as above separated), 44 species and 20 varieties occur in North America, 31 species and 18 varieties having been described by him as new in the paper cited. Of them he says:

"I have been able to associate with definite host plants all but two of the known eastern species as well as certain of those found in the southwestern states. In several instances this relation appears to be more dependent on the predaceous habits of the bugs which feed largely on the aphids or plant lice found on particular hosts, rather than the sap from the plant. In fact I have not detected a single case where the bugs have fed on the foliage of a plant and produced the characteristic leaf-bug injury which is always to be seen on plants infested by true leaf-feeders. The general scarcity of these insects as compared with leaf-feeding species is only another indication of their predatory habits, for predaceous forms never attain great abundance except sporadically in favored spots."

Our eastern species of *Deræocoris*, as here limited, are separated into four groups as follows:

KEY TO GROUPS OF EASTERN SPECIES OF DERÆOCORIS.

- a. Scutellum punctate; tarsal claws deeply cleft near base (pl. X, fig. 30).

GROUP A, p. 893.

- aa. Scutellum impunctate.
- b. Tarsal claws deeply cleft near base.
- c. Upper surface practically glabrous, at most only sparsely and finely pubescent; hind tibiæ with a row of spines or heavily chitinized hairs on the front face; form elongate-oval. GROUP B, p. 894.
- cc. Upper surface heavily pubescent or hairy, at least with long hairs near the front angles of pronotum; hind tibiæ without distinct spines on the front face, usually rather closely set with long prominent hairs. GROUP C, p. 901.
- bb. Tarsal claws not or very slightly cleft (pl. X, fig. 28). GROUP D, p. 902.

GROUP A.—DERÆOCORIS.

This group is represented in this country only by the European species *Deræocoris ruber* (Linn.) and four color varieties as recognized by Knight. These he separated as follows:

KEY TO SPECIES AND VARIETIES OF GROUP A, DERÆOCORIS.

- a. Head except tylus, pronotum, scutellum and elytra except apex of cuneus, reddish. 989. RUBER.
- aa. Elytra or pronotum, or both, more or less blackish.
- b. Elytra reddish, pronotal disk black or largely blackish. 989a. var. BICOLOR.
- bb. Elytra and pronotum more or less blackish.
- c. Pronotal disk largely, scutellum, corium and embolium, except apically, reddish. 989b. var. DANICUS.
- cc. Pronotum, scutellum, elytra except narrowly at base of corium and embolium, black.
- d. Cuneus reddish on the basal half. 989c. var. SEGUSINUS.
- dd. Cuneus entirely black. 989d. var. CONCOLOR.

989 (1071). DERÆOCORIS RUBER (Linnæus), 1758, 446.

Rather broadly oval; glabrous, shining. Head dull yellow, tinged with reddish, tylus brown or black; pronotum, scutellum, clavus and corium straw-yellow, usually in part or wholly heavily tinged with reddish; embolium and outer margin of cuneus pale translucent yellow; cuneus bright red, its tip black; membrane fuscous, a large spot opposite tip of cuneus paler; legs dull reddish-yellow, femora, except apical fourth, piceous, tarsi fuscous; ventrals and meso- and metasterna shining piceous-black, their sides and prosternum reddish-yellow. Joint 1 of antennæ piceous, nearly as long as head; 2 three times as long as 1, piceous, paler at middle, distinctly stouter toward apex, the clavate portion thickly beset with inclined blackish bristle-like hairs; 3 yellowish, dusky at tip, two-fifths as long as 2; 4 dusky brown, one-half the length of 3. Pronotum two and two-third times wider at base than apex, sides straight, hind angles broadly rounded, basal margin sinuate; disk convex, rather sparsely, finely and irregularly punctate. Scutellum sparsely and finely punctate. Corium rather finely, closely and shallowly punc-

tate, clavus more coarsely and rugosely so; costal margins parallel on basal two-thirds, thence feebly rounded to apex. Tarsal claws and arolia as in pl. X, fig. 30. Length, 7.2—8 mm.

Brooklyn, N. Y., July 14, on rose (*Davis*). An introduced European species recorded in this country only from Massachusetts, Connecticut, New York and Pennsylvania. As far as known it is predaceous in habits, without definite host plant. Douglas & Scott (1865, 442) mention it as: "Common everywhere in the London district on nettles and bramble flowers in July and August."

The form above described is that of typical *ruber*. Of the varieties Knight (1921, 194) says: "All the varieties of *ruber* are merely melanic color forms, each particular color phase being an index to the conditions of environment under which the bug developed." Probably the best marked one is var. *seguisinus* Muller (1766, 191), which Davis found at Staten Island, N. Y., July 10, on red raspberry.

GROUP B.—DERÆOCORIS.

Elongate-oval, glabrous robust species with the width less than one-half the length; ground color generally dull grayish-yellow, marked with fuscous punctures or blotches; scutellum smooth; hind tibiæ spinose in front; tarsal claws deeply cleft near base. This group comprises nine species and two color varieties from the eastern states. All but two of the species have been described since the Van Duzee Catalogue was issued.

KEY TO EASTERN SPECIES OF GROUP B, DERÆOCORIS.

- a. Tibiæ banded or spotted with fuscous-brown or pale, rarely (*borealis*) wholly dark without distinct bands.
- b. Membrane with a large rounded fuscous spot on apical half, this frequently united at base with a fuscous streak which extends down from between the cells, thus leaving a large pale spot each side of middle and bordering apex of cuneus.
- c. Calli usually solid black with a broad piceous ray behind each, in pale specimens somewhat brownish with the rays behind them dark brown or wanting, the pronotal disk then with a narrow median line and margins pale; clavus and corium in part piceous, embolium pale; host plant, alders. 990. BOREALIS.
- cc. Calli more or less brownish or pale without distinct rays behind them; elytra and pronotum more uniformly colored, either brownish-yellow or dark brown; host plants, apple, pear and *Cratægus*. 991. FASCIOLUS.
- bb. Membrane usually somewhat infuscated, but without spot and streak as in b.

- d.* Beak reaching onto second ventral; membrane feebly or not at all infuscated; femora pale with two blackish bands on apical third; basal half of hind tibiæ with two fuscous bands; host plant, hickory. 992. GRANDIS.
- dd.* Beak reaching between hind coxæ; membrane, femora and hind tibiæ without the combination of markings mentioned in *d.*
- e.* Femora either wholly or with apical half uniformly dark; ventrals either shining reddish or dark chestnut brown; host plants, yellow birch and mountain maple. 993. BETULÆ.
- ee.* Femora with apical half distinctly banded or wholly pale.
- f.* Second antennal sparsely beset with suberect hairs which are three times as long as the thickness of the segment; pronotal disk with margins and median line pale, calli and a broad ray behind each of them black; vertex with a pale impressed spot each side next to eye; host plant, hoary alder. 994. ALNICOLA.
- ff.* Second antennal without long hairs; pronotal disk pale brownish-yellow or fuscous without distinct rays behind the calli; corium with a spot at middle and outer apical angle fuscous; host plant, elm. 995. APHIDIPHAGUS.
- aa.* Tibiæ uniformly pale or yellowish.
- g.* Apical third of hind femora with two brown or fuscous bands; calli with apical half pale or brownish and without distinct dark rays behind them; elytra nearly uniformly brownish-yellow or dark brown; membrane with a round brownish spot on apical half; host plants, beech and apple. 991a. FASCIOLUS var. CASTUS.
- gg.* Apical third of hind femora with but one fuscous band; apical half of membrane pale or tinged with dusky but without a round fuscous spot.
- h.* Upper surface dull greenish-yellow to brownish, often marked with fuscous or blackish, but never wholly dark brown or black; calli pale margined with black or wholly black.
- i.* Calli with only the margins black; upper surface rich brownish to fusco-brownish, shining; host plant, elm. 996. NITENATUS.
- ii.* Calli wholly black, rarely (var. *pallens*) with only the margins black.
- j.* Upper surface fuscous to blackish; pronotum and scutellum usually with a pale median line; corium without distinct fuscous spots; host plant, white oak. 997. QUERCICOLA.
- jj.* Upper surface pale brownish-yellow; corium with three small vague rounded fuscous or brownish spots, one at base, one at middle, the third on outer apical angle; host plant, bur oak. 997a. var. PALLENS.
- hh.* Upper surface, including calli and scutellum, a nearly uniform dark brown or black. 998. DAVISI.

990 (—). DERÆOCORIS BOREALIS Van Duzee, 1920, 354.

Color variable, usually pale brownish-yellow, marked with piceous or brownish; head pale with two lines on front, base and tip of tylus, dorsal margins of loræ and a spot beneath each eye, brown or blackish; pronotum

tum and calli as in key; scutellum brownish-yellow with piceous stripe each side, margins and tip of median line paler; elytra glabrous, shining, base of clavus and large spot on disk of corium piceous, embolium pale; cuneus pale translucent, its apex fuscous; membrane as in *b* of key; legs pale brownish-yellow, femora, especially the hind ones, darker toward tip; ventrals blackish in male, paler in female. Joint 1 of antennæ black or dark brown, slightly longer than width of vertex surpassing tylus by half its length; 2 brown or blackish, often pale at middle, pubescent with long pale hairs, three times the length of 1; 3 and 4 brownish to black, 3 two-fifths the length of 2; 4 three-fourths as long as 3, male, one-half as long, female. Beak reaching tips of middle coxæ. Length, 6.4—7 mm. (Fig. 186, *a*).

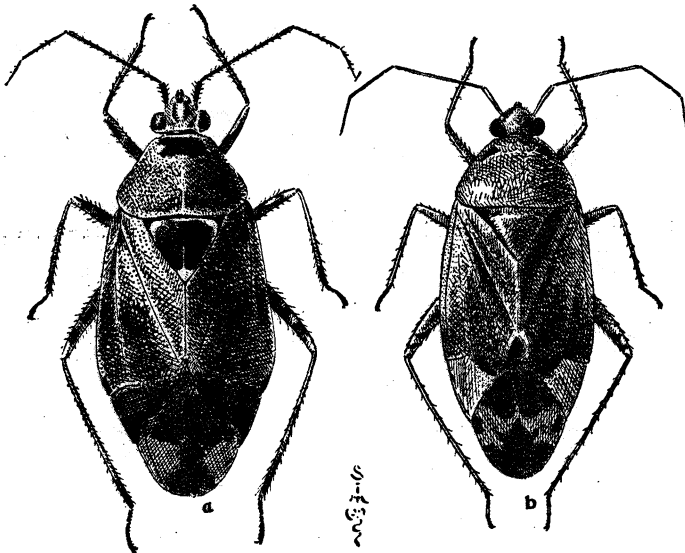


Fig. 186. *a*, *Deræocoris borealis* Van D. X 8; *b*, *Lygus hirticulus* Van D. X 10.
(After Drake, Tech. Publ. 16, N. Y. St. Coll. For.).

Quinz Lake, Quebec, Aug. 7 (*Van Duzee*). Ranges from Nova Scotia and New England west to Wisconsin and south to New Jersey. Occurs on alders in damp cool shaded places.

991 (—). *DERÆOCORIS FASCIOLUS* Knight, 1921, 123.

Brownish-yellow, marked with fuscous punctures; vertex with brownish transverse markings, tylus with two dark stripes; calli bordered behind with a transverse blackish line; scutellum either uniform dull yellow or brownish-yellow with two darker stripes; apical two-thirds of clavus and corium a somewhat darker brown than the remainder of elytra; basal half of embolium yellow dotted with small fuscous punctures, apical half darker; cuneus yellowish translucent, the tip brown; membrane as in *b* of key; legs and sterna greenish-yellow, hind femora with two brownish rings on apical third; tibiæ usually with two vague

brownish rings on basal third; ventrals pale brown with a reddish tinge. Joint 1 of antennæ subglabrous, dark brown, slightly longer than width of vertex; 2—4 pubescent, 2 dark reddish-brown, paler at middle, nearly three times as long as 1; 3 and 4 blackish-brown, 3 two-fifths as long as 2, 4 two-thirds the length of 3. Pronotum three-fifths wider at base than long, sides nearly straight; disk narrowly margined, rather coarsely, somewhat irregularly punctate, hind margin very slightly sinuate. Elytra coarsely, evenly, rather sparsely punctate. Length, 6.3—6.5 mm.

Marion, Martin and Lawrence counties, Ind., June 3—July 11; beaten from *Cratægus*. (*W. S. B.*). Muskegon, Mich., and Willow Springs, Ill., June 27—July 16 (*Gerhard*). Ranges from Quebec and New England west to North Dakota, British Columbia and Oregon, the distribution being mainly north of latitude 40°. Knight found it at Batavia, N. Y., on apple trees closely associated with the rosy apple aphid, *Anuraphis rosæus* Baker. "The white-wax-coated nymphs of the bug frequent the aphid-curved leaves, feeding on the aphids and honey-dew excretions."

991a (—). *DERÆOCORIS FASCIOLUS CASTUS* Knight, 1921, 125.

Differs from typical *fasciolus* only in color, the upper surface being a nearly uniform pale brownish-yellow, the tip of the cuneus alone usually distinctly darker; vertex and tylus with fuscous markings as there; calli wholly pale or in part suffused with brownish; embolium pale yellowish-hyaline throughout; legs almost wholly pale yellow, the brown markings of hind femora very small or wanting. Antennæ yellow, base of joint 1, apex of joint 2 and joints 3 and 4 more or less fuscous or dusky. Length, 6—6.5 mm.

Laporte and Marion counties, Ind., June 19—July 25 (*W. S. B.*). Holland, Mich., July 8 (*Gerhard*). Staten Island, N. Y., July 15 (*Davis*). The known range extends from Quebec and Massachusetts west to Michigan and Indiana. Not recorded south of New Jersey. Knight found it on beech at Ithaca, N. Y., where "it was associated with and predaceous upon the beech aphid, *Phyllaphis fagi* (L.), which rolls the leaves tightly from the margin." Hussey records it as "common in July on aphid-infested elms in the dune region of southwestern Michigan."

992 (1070). *DERÆOCORIS GRANDIS* (Uhler), 1887, 230.

Ground color above dark greenish- or brownish-yellow, with fuscous punctures; head with a stripe each side of vertex, two lines on tylus, and cheeks in part, dark brown. Pronotum with calli shining black, the area behind them fuscous-brown, with a vague wide paler median stripe; scutellum dark brown, the basal angles a narrow median line on apical half and tip pale; outer apical third of corium clouded with fuscous;

embolium and cuneus yellowish translucent with fuscous punctures, their tips darker; membrane a nearly uniform pale hyaline, the blackish color of the dorsum beneath showing through; legs pale yellow, marked as in key; ventrals dark chestnut-brown, shining, sparsely clothed with rather long prostrate yellowish hairs. Antennæ dull yellow, apex of joint 2 and apical halves of 3 and 4 dusky; joint 1 slightly longer than width of vertex; 2 very slender, slightly thickened and pubescent toward apex, three and a third times longer than 1; 3 two-fifths as long as 2, one-third longer than 4. Pronotum two and a half times as wide at base as apex, disk, except calli, coarsely irregularly punctate, with sides rather strongly declivent. Length, 6.5—7.2 mm.

Lake and Kosciusko counties, Ind., June 15—July 12. The known range extends from Ontario and New England west to Illinois and south to Maryland. Distinguished principally by the long beak. Knight's specimens were taken on young hickory trees in July. He states (1921, 128) that Uhler: "In describing *grandis* had under observation at least four different species and made allowance to cover all the forms which he took to be merely variations. Nearly every species collected from the United States that is larger than *nebulosus* has at one time or another stood under the name *grandis*."

993 (—). *DERÆOCORIS BETULÆ* Knight, 1921, 129.

Ground color above ranging from brownish-yellow to fuscous-brown; vertex with a large black spot, tylus and calli wholly shining black; pronotum behind calli fuscous-black in darker forms, with only fuscous punctures in the paler ones; scutellum black with basal angles paler, or pale with two oblong brown spots; corium in dark specimens rather heavily tinged with fuscous; cuneus with inner margin and tip fuscous to blackish; membrane in great part fuscous, paler on sides near tip of cuneus; femora dark brown or black, the knees and extreme base pale; tibiæ yellow with two broad rings and apex dark brown; ventrals of pale specimens as in key, of dark ones shining blackish-brown, their sides rather thickly pubescent; meso- and metasterna opaque black. Antennæ in dark specimens with joints 1 and 2 black, the base of 2 paler, 3 and 4 dusky brown; in pale ones, 1 dark brown, 2—4 yellowish, pubescent, the apex of 2 and 4 darker; joint 1 slightly longer than width of vertex, 2 three and a fourth times longer than 1, 4 two-thirds as long as 3. Beak reaching apex of middle coxæ. Pronotum two-thirds wider at base than long, sides straight, narrowly margined, disk rather coarsely, irregularly punctate, more finely so near base; hind margin feebly sinuate. Elytra rather coarsely, evenly, not densely punctate. Length, 6.8—7.5 mm.

Staten Island and Rossville, N. Y., June 9—20 (*Davis*). Ithaca, N. Y., July 2 (*Gerhard*). Ranges from Maine west to Pennsylvania and south to New Jersey. The types of Knight were taken at Ithaca July 2, on a large yellow birch, *Betula lutea*

Michx., "mostly from among clusters of aphid-deformed leaves."

994 (—). *DERÆOCORIS ALNICOLA* Knight, 1921, 132.

General color brownish-yellow with fuscous punctures; scutellum yellow with a broad brown stripe each side of middle; outer apical half of corium usually tinged with fuscous-brown; cuneus yellow, the tip brown; membrane dusky translucent, paler on sides; legs pale yellow, apical third of femora and two rings on all tibiæ brown; under surface as in *betulæ*. Antennæ with joint 2 yellow, darker toward tips, sparsely beset with long erect hairs, three and one-half times longer than 1; 3 and 4 dusky, 4 three-fourths as long as 3. Length, 6.5—6.8 mm.

McLean Bogs, Tompkins Co., N. Y., July 3 (*Gerhard*). Recorded only from Ottawa, Ontario, Connecticut, and New York. Taken only on *Alnus incana* (L.).

995 (—). *DERÆOCORIS APHIDIPHAGUS* Knight, 1921, 134.

Dull brownish-yellow, thickly marked with fuscous punctures; head with a bar at base of vertex, some transverse lines each side of front and two lines on tylus, brown or black; calli with basal three-fourths shining black, apical fourth yellow; scutellum brown with narrow median line and lateral stripes pale; corium usually with a dark brown blotch on middle and another on outer apical angle; embolium and cuneus pale translucent yellow marked with small brownish punctures, the tips brownish; membrane dusky translucent, the veins darker; legs pale yellow, apical third of middle and hind femora and basal halves of their tibiæ each with two brown rings; ventrals blackish-brown, shining. Antennæ dull yellow to fuscous-brown, joint 1 slightly shorter than width of vertex, 2 three times as long as 1; 3 and 4 united three-fourths the length of 2. Beak reaching between the middle coxæ. Pronotum nearly three-fourths wider at base than long, sides and basal margin distinctly sinuate, disk rather coarsely and unevenly punctate. Elytra more finely and evenly punctate. Length, 6—6.3 mm.

Willow Springs, Ill., and Twin Lake, Minn., June 29—July 3 (*Gerhard*). Washington, D. C., June 26 (*Davis*). Ranges from Nova Scotia, Ontario and New England west to the Dakotas and Colorado and south to Virginia. Knight states that he has found it "breeding only on elm and in the curled leaves infested with the aphid, *Schizoneura americana* Riley."

996 (1070a). *DERÆOCORIS NITENATUS* Knight, 1921, 141.

Head yellow with oblique transverse marks on vertex and two lines on tylus brown; pronotum with collar, calli and median line pale yellow, remainder dull yellow, more or less blotched with patches of blackish-brown punctures, the calli each with a curved brown dash; scutellum yellow, usually with two vague brown stripes; corium in great part dark brown, clavus and embolium, except toward their tips, paler; cuneus yellow, the tip brown; membrane yellowish-hyaline, the veins and apical

third of cells darker; legs pale yellow, hind femora often with a vague ring near apex; under surface pale to dull yellow, the sides with a row of fuscous spots. Joints 1 and 2 of antennæ yellow, the apex of 2 and all of 3 and 4 pale fuscous-brown; joint 1 slightly longer than width of vertex, 2 three times as long as 1, 3 and 4 united, one-sixth shorter than 2. Beak reaching apex of middle coxæ. Pronotum two and a half times wider at base than apex, sides straight, disk finely, sparsely, irregularly punctate. Clavus and corium rather finely, evenly and sparsely punctate. Length, 5.7—6 mm.

St. Anthony Park, Minn., August 5 (*Gerhard*). Staten Island, N. Y., August 3 (*Davis*). Ranges from Quebec and New England west to North Dakota and Colorado and southwest to North Carolina. Predaceous on *Eriosoma lanigerum* (Hausm.), the aphid which forms the rosette gall of elm leaves. The bug is the *Camptobrochis nitens* Reut. (1909, 56), a preoccupied name. The relatively smaller size, pale calli, polished brown hue of corium and almost wholly pale scutellum and legs are the principal characters separating this species from its allies.

997 (—). *DERÆOCORIS QUERCICOLA* Knight, 1921, 138.

Darker than *nitenatus*; head with brown markings as there; calli black, their front margins and a wedge-shaped spot between their front halves, yellow; disk behind them usually brown with sides and a vague median line pale; scutellum yellow, normally with two wide brown stripes; elytra brownish-black to piceous, darkest on middle and outer apical half of corium, clavus, basal half of corium and embolium except near apex, pale brownish-yellow with fuscous punctures; cuneus and membrane as in *nitenatus*; legs pale yellow, hind femora usually with one or two small brown spots near apex; ventrals dull yellow, their spiracles and median line darker. Antennæ yellow, the apical joints dusky; the relative length of segments nearly as in *nitenatus*. Pronotum narrower with sides less convergent and more sinuate than there, the base but slightly more than twice as wide as apex, disk more finely and evenly punctate. Length, 5.8—6 mm.

Harrison Co., Ind., June 9 (*W. S. B.*). Long, Pine and Staten Islands, N. Y., June 19—July 25 (*Davis*). Glen Ellyn and Chicago, Ill., June 19—July 4 (*Gerhard*). Ranges from Quebec and New England west to Minnesota and Colorado and south and southwest to Georgia and New Mexico, occurring for the most part on *Quercus alba*. The var. *pallens* Knight (1921, 140) is distinguished only by the characters given in key and is recorded from New York, Minnesota, South Dakota and New Mexico.

998 (—). *DERÆOCORIS DAVISI* Knight, 1921, 140.

Head dull yellow, vertex with five or six oblique spots and tylus with two lines brown; pronotum, clavus and inner half of corium dark brown

to black; embolium, basal half of cuneus and usually the outer half of corium dull translucent yellow with fuscous punctures; scutellum dark brown, a spot on each basal angle and tip pale; apical half of membrane pale, basal half and veins fuscous-brown; legs pale yellow, hind femora often with a dark spot near apex; ventrals brownish-black, paler on sides, sparsely and finely pubescent. Antennæ pale yellow, joints 3 and 4 in part dusky-brown; joint 1 slightly longer than width of vertex, 2 three times as long as 1, 3 as long as head, 4 four-fifths the length of 3. Beak reaching base of hind coxæ. Pronotum more than twice as wide at base as apex, sides nearly straight, narrowly margined; basal margin slightly sinuate, narrowly pale; disk finely and closely punctate. Corium finely and sparsely punctate, clavus more coarsely and closely so. Length, 5.3 mm.

Marshall Co., Ind., June 11 (*W. S. B.*). Staten Island, N. Y., June 18 (*Davis*). Recorded only from New York and Spring Hill, Ala.

GROUP C.—DERÆOCORIS.

This group as characterized in the key, p. 893, is represented in the eastern states by but a single species with several color varieties.

999 (1067). *DERÆOCORIS SAYI* (Reuter), 1876, 76.

Elongate-oval, robust. Dark fuscous-brown to black, sparsely clothed with rather long inclined yellowish hairs; head, scutellum, collar and edges of side margins of pronotum, dull yellow; embolium and cuneus brownish translucent; membrane fuscous-brown, the veins darker; femora dark brown to blackish with a pale ring near apex; tibiæ dull yellow with two rings on basal half and tip brown; tarsi and beak fuscous-brown; under side of head and prosternum dull yellow, meso- and metasternum opaque black, ventrals dark chestnut-brown, shining. Antennæ dark brown, thickly beset with suberect hairs; joint 1 as long as width of vertex, 2 cylindrical, about three times as long as 1, 3 slightly longer than 1, 4 two-thirds the length of 3. Beak reaching between middle coxæ. Pronotum with base nearly two and a half times as wide as apex, sides straight, calli large, smooth, feebly convex, remainder of disk coarsely and evenly punctate. Elytra more finely and more thickly punctate. Tibiæ beset with numerous long erect bristle-like hairs. Length, 7.5—8 mm.

Vermilion Co., Ind., June 12 (*W. S. B.*). Glen Ellyn, Ill., June 19 on oak (*Gerhard*). Raleigh, N. Car., early May (*Brimley*). Ranges from New York west to Minnesota and southwest to North Carolina, St. Augustine, Fla., Alabama and Texas. Occurs on various species of oak.

In addition to the typical form as above described, Knight (1921, 175) has given names to five color varieties, which he separates as follows:

KEY TO COLOR VARIETIES OF DERÆOCORIS SAYI.

- a. Scutellum pale or red.
 - b. Side margins of pronotum black or only narrowly pale at apical angles; front of head blackish. 999a. var. *FRONTALIS*.
 - bb. Side margins of pronotum broadly pale or reddish.
 - c. Embolium black like the corium. 999b. var. *MARGINATUS*.
 - cc. Embolium pale and cuneus more or less translucent. 999c. var. *COSTALIS*.
- aa. Scutellum black or only the median line pale apically.
 - d. Femora black, annulated with pale near apex. 999d. var. *UNICOLOR*.
 - dd. Femora pale on basal half, broadly annulated with black at apical third. 999e. var. *FEMORALIS*.

Of these varieties Knight records *frontalis* from Glen Ellyn, Ill.; *costalis* from Massachusetts, New York and Illinois; *unicolor* from Illinois and Wisconsin; *marginatus* from Michigan, Illinois, Georgia and Florida, and *femoralis* from Minnesota.

GROUP D.—DERÆOCORIS.

Oblong or elongate-oval species of medium size having the scutellum smooth and tarsal claws without distinct cleft at base. This group comprises six of our eastern species.

KEY TO EASTERN SPECIES OF GROUP D, DERÆOCORIS.

- a. Upper surface practically glabrous, at most only finely and sparsely pubescent.
 - b. Calli solid black or with only a small pale spot on each outer apical angle.
 - c. Scutellum uniformly brownish; second antennal similar in both sexes, slender on basal half, thicker toward apex, its erect hairs as long as thickness of segment; apical half of hind tibiæ broadly pale. 1000. *APPALACHIANUS*.
 - cc. Scutellum dark brown with basal angles and apex ivory-white; second antennal as thick at middle as on apical half, its erect hairs in female three times as long as thickness of segment; apical half of hind tibiæ dark brown with a vague median pale ring; host plant, tamarack. 1001. *LABRICICOLA*.
 - bb. Calli with entire front margin ivory-white, this hue with a spur projecting obliquely inward from each apical angle toward middle of callus; second antennal as thick at middle as on apical half, its erect hairs not longer than thickness of segment; host plant, white pine. 1002. *PINICOLA*.
- aa. Upper surface thickly pubescent or at least with long hairs near front angles of pronotum.
 - d. Hind femora with basal half pale flecked with two or three rows of small darker spots; apical half fuscous to blackish with a pale ring; tibiæ with two pale rings. 1003. *KENNICOTTI*.

dd. Hind femora uniformly dark brown or blackish.

e. Pronotum, elytra and legs uniformly dark brown, the paler subtranslucent areas of elytra stained with brownish; apical half of hind tibiæ usually with a distinct pale ring; host plant, scrub pine. 1004. NIGRITULUS.

ee. Pronotum fuscous to blackish; elytra fuscous to blackish, the paler areas not stained with brown; hind tibiæ with a vague pale ring or none; gula, sides of tylus and front coxæ pale; host plants red and gray pines. 1005. ALBIGULUS.

1000 (—). DERÆOCORIS APPALACHIANUS Knight, 1921, 160.

Dark fusco-brownish; head paler brown with brownish-black markings; pronotum with calli and front margin of disk brownish-black; clavus and base of corium yellowish, subtranslucent, embolium paler; cuneus dark brown, paler at middle; membrane fusco-brownish, paler each side near tip of cuneus; legs reddish- or fuscous-brown, tips of coxæ and basal half of femora paler; tibiæ dark brown, their apical halves dull yellow; ventrals dark brown to piceous, shining. Antennæ dark brown, blackish apically, joint 1 almost as long as width of vertex, 2 three times as long as 1, the apical half visibly thickened, 3 two-fifths the length of 2, one-fourth longer than 4. Beak reaching middle of hind coxæ. Length, 6.2 mm.

Known only from Tryon, N. Car., where it was taken May 21 at light.

1001 (—). DERÆOCORIS LARICICOLA Knight, 1921, 164.

Dull greenish-yellow, thickly marked with fuscous punctures; vertex with four curved stripes and tylus with two lines, blackish; calli shining black, a small spot on each apical angle and another between them, yellow; apical half of corium with a large irregular brown blotch; embolium and cuneus dull translucent yellow dotted with fuscous, their tips darker; membrane dusky hyaline, the cells and sides paler, veins brown; tibiæ and apical halves of femora dark brown, the former with two pale or reddish rings; basal halves of femora, coxæ, prosternum and osteolar duct pale yellow; meso- and metasterna opaque black; ventrals shining black, paler at middle. Antennæ dark brown; joint 1 slightly longer than width of vertex; 2 subcylindrical, tapering at base, three times longer than 1; 3 and 4 united two-thirds the length of 2. Pronotum with sides strongly converging, base, especially in female, distinctly flaring, two and a fourth times as wide as apex, disk coarsely, very irregularly punctate, with pale calloused areas between the punctures. Elytra more finely and more evenly punctate. Length, 6.2—6.5 mm.

Ithaca, N. Y., June 27 (*Davis and Gerhard*). Recorded only from Massachusetts, New York and Minnesota, but probably occurs on tamarack throughout most of the range of that tree.

1002 (—). DERÆOCORIS PINICOLA Knight, 1921, 162.

Pale brownish-yellow, thickly flecked with blackish punctures; head with the two curved median dark stripes broken to form oblique, trans-

verse marks; scutellum usually pale or dull yellow with two wide brown abbreviated stripes; apical third of corium and embolium more or less darkened with fuscous-brown, narrow line along base of cubitus pale; membrane translucent fuscous, paler near tips of cuneus, veins dark brown; legs black or dark brown, coxæ, trochanters and basal third of femora in part dull yellow, tibiæ with two vague paler rings; ventrals, in dark specimens, shining black, in pale ones, dull yellow with spiracles and median line blackish. Antennæ dark brown to black, joint 1 four-fifths as long as width of vertex; 2 three and one-half times longer than 1, feebly thickened from base to apex; 3 and 4 united two-thirds the length of 2. Pronotum shorter, with sides less convergent than in *larvicola*, hind angles more broadly rounded; disk, as well as that of elytra, rather finely evenly, not densely punctate. Tarsal claws and arolia as in pl. X, fig. 28. Length, 6—6.4 mm.

Ithaca, N. Y., July 13 (*Gerhard*). Wyandanch, L. I., N. Y., July 3 (*Davis*). Ranges from Ontario and New England west to Minnesota and south to Washington, D. C. Knight found the fifth stage nymphs in numbers on June 9 near Ithaca, N. Y., on white pine. They were living among and were predaceous upon the pine bark aphid, *Chermes pinicorticis* (Fitch) and were covered with a coat of white wax-like material similar to that of the aphids.

1003 (—). *DERÆOCORIS KENNICOTTI* Knight, 1921, 166.

Dull grayish-yellow; head with inner margin of eyes, some transverse bars each side of front, base of tylus, loræ and cheeks, black; calli and area in front of them shining black; scutellum black, basal angles and tip pale; elytra grayish-yellow, translucent; narrow edge and tip of embolium, apex of clavus, spots at base, near middle and on apex of corium, fuscous to blackish; basal half of cuneus pale with black punctures, apical half brownish-black; membrane fuscous, cells and a spot near tip of cuneus paler, veins darker; legs blackish, hind femora and tibiæ as in key; ventrals dark brownish-black, thickly pubescent. Joint 1 of antennæ dull yellow, darker toward base, one-tenth shorter than width of vertex; 2 testaceous, blackish toward apex, three and one-half times as long as 1; 3 and 4 blackish-brown, 3 two-fifths as long as 2, 4 one-tenth shorter than 3. Beak reaching between middle coxæ. Length, 5.7—6.7 mm.

Recorded only from Mt. Katahdin, Maine, and Great Slave Lake, Canada.

1004 (1068). *DERÆOCORIS NIGRITULUS* Knight, 1921, 170.

Color a nearly uniform dark reddish-brown, rather thickly clothed with long, suberect brown hairs; head often with tylus and basal margin of vertex paler; scutellum, embolium and cuneus concolorous with corium; membrane pale brownish-hyaline, its veins brown; legs and under surface brown, trochanters, tips of coxæ and osteolar duct paler; tibiæ with

a broad pale ring on apical half and thickly beset with long bristle-like hairs. Antennæ dark brown, beset with numerous long, suberect hairs; joint 1 slightly shorter than width of vertex, 2 three times as long as 1, 3 about two-fifths as long as 2, one-fourth longer than 4. Beak reaching base of hind coxæ. Vertex and calli smooth, shining, the latter rather prominent. Remainder of upper surface, except membrane, rather finely, evenly and thickly punctate. Length, 6—6.4 mm.

Washington, D. C., June 15 (*Gerhard*). Recorded only from there, Maryland and Virginia. Described by Reuter (1909, 55) as *Camptobrochis nigrita*, a preoccupied name.

1005 (—). *DERÆOCORIS ALBIGULUS* Knight, 1921, 171.

Color above a nearly uniform dark fuscous to black, thickly clothed with short, suberect yellowish hairs; a narrow stripe bordering eyes, sides of tylus, a spot on cheeks, very narrow basal margin of pronotum and basal angles and tip of scutellum, usually dull yellow; membrane dark smoky brown, the cells and sides near tip of cuneus paler; legs and under surface dark brown to blackish, the coxæ, prosternum and under side of head in great part dull yellow. Antennæ dark brown, pubescent, the joints relatively slightly shorter than in *nigritulus*. Beak reaching middle of hind coxæ. Pronotum three-fifths wider at base than long, sides strongly converging from the base; disk, except calli, densely and rather finely punctate. Clavus and corium somewhat rugose, rather finely and unevenly punctate. Length, 6.5—7.2 mm.

Lake and Marshall counties, Ind., June 11—28 (*W. S. B.*). Miller, Ind., June 27 (*Gerhard*). Taken from the gray or Labrador pine, *Pinus divaricatus* (Ait.). Known only from New York, Michigan and Indiana. Larger and darker than *nigritulus* with pronotum more densely punctate.

Subfamily VIII. DICYPHINÆ Oshanin, 1912, 70.

Elongate, slender, usually glabrous species having the head wider across eyes than apex of pronotum, usually distinctly exserted with front subvertical; loræ linear, distinct; pronotum subcampanulate or trapezoidal, its collar prominent; elytra usually entire and surpassing tip of abdomen, often in great part largely hyaline; last tarsal joint slender, its claws sharply bent, not cleft near base; arolia usually absent or minute. Four genera are represented in the eastern states.

KEY TO EASTERN GENERA OF DICYPHINÆ.

- a. Hind margin of pronotum straight or nearly so, the mesoscutum but slightly exposed; basal margin of calli not passing apical third of pronotum; head, viewed from the side, not projecting before eyes; elytra elongate-oval, hyaline or glassy with red or dark markings; pseudarolia absent (pl. X, fig. 21). I. HYALIODES, p. 906.

- aa.* Hind margin of pronotum more or less concave, leaving mesoscutum broadly exposed; basal margin of calli nearly or quite reaching middle of pronotum; head, viewed from the side, distinctly surpassing front line of eyes; pseudarolia prominent (pl. X, figs. 18—20).
- b.* Pronotal disk distinctly transversely sulcate just behind calli; eyes large, vertical; head narrowed to form a distinct neck behind eyes. II. DICYPHUS, p. 907.
- bb.* Pronotal disk not transversely sulcate behind the calli.
- c.* Eyes large and vertical, the head space behind them short, not equal to half the width of an eye. III. CYRTOPELTIS, p. 911.
- cc.* Eyes small, oblique placed at middle of head, the space behind them subequal to lateral width of an eye. IV. MACROLOPHUS, p. 913.

I. HYALIODES Reuter, 1876, 83.

Elongate-oval, shining species having the head strongly narrowed behind eyes to form a distinct neck, its front vertical, vertex wider than the lateral width of an eye; pronotum subcampanulate, sides strongly converging from base to apex, hind portion convex with basal angles subnodulose; elytra narrowly oval, surpassing abdomen by half the length of membrane; corium, embolium and cuneus of nearly the same texture as membrane; cuneus but slightly deflexed, membrane one-celled. One of the two known species occurs in our territory.

1006 (1106). *HYALIODES VITRIPENNIS* (Say), 1832, 24; I, 345.

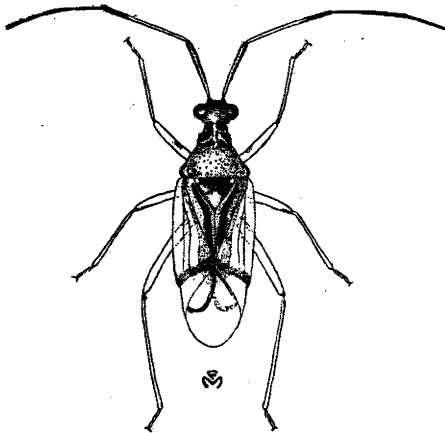


Fig. 187, X 8. (Original).

Pale straw-yellow; collar, calli, base and narrow side margins of scutellum and veins of membrane dark brown; head, clavus, edge of costal margin and legs dull yellow, often more or less tinged with red; scutellum usually white; transverse stripe across apex of corium bright red; remainder of elytra pale glassy hyaline; under surface pale yellow, often tinged with red, the sides of ventrals sometimes darker. Joint 1 of antennæ yellow, its apical half or more usually bright red, about as long as pronotum; 2 much

more slender, dull yellow, fuscous at apex, one-half longer than 1; 3 and 4 dusky, very slender, united two-thirds the length of 2. Beak reaching middle coxæ. Basal half of pronotum finely pubescent, densely and

coarsely punctate. Scutellum smooth, equilateral, impressed at base, its margins pubescent. Inner margin of embolium with a row of minute punctures. Length, 4.5—4.8 mm. (Fig. 187).

Frequent throughout Indiana, June 22—Sept. 22. Dunedin, Fla., March 13—20. In Indiana it occurs in numbers on jewelweed or touch-me-not, *Impatiens biflora* Walt., along the borders of streams and ponds in company with *Lygus pabulinus* (Linn.); also frequently beaten from wild grape. Not before recorded from a definite Florida station, and apparently very scarce in that State, but two having been taken at Dunedin. They were swept from ferns in a moist dense hammock. The known range extends from Quebec and New England west to Iowa and Kansas and southwest to North Carolina, Florida and Texas. Of it Uhler (1884, 287) wrote: "This elegant little insect lives in great numbers upon wild grapevines, but it is often equally common upon red and black oak, particularly in early autumn, where it may be seen searching for small tender insects and larvæ."

The color of *vitripennis* is exceedingly variable, the pronotum often being wholly pale, or with only a black spot at base; scutellum at times in part or wholly black; the dark stripe along the suture red or black, sometimes wholly wanting. The form above described is one extreme. The other is the variety *discoidalis* Reut. (1909, 61) in which the neck, collar, calli, wide median stripe on pronotum, clavus, commissure, line across tips of coria, veins of membrane and antennæ, except basal joint, are dark brown to blackish. All possible variations occur between the two extremes, so that the varietal name is superfluous.

II. DICYPHUS Fieber, 1858, 327.

Elongate, slender species having the front of head subvertical; tylus prominent, compressed; eyes large, separated from pronotum by a space subequal to width of an eye; vertex convex, not wider than the width of an eye, without basal carina; beak usually reaching or surpassing hind coxæ; antennæ about half the length of body, the joints variable in length; pronotum subcampanulate, its disk smooth and with a transverse impression both in front of and behind calli, hind margin usually broadly and deeply concave; mesoscutum strongly convex, usually widely exposed; scutellum relatively small, convex, its apical half usually with an obtuse longitudinal carina;

elytra entire, surpassing abdomen by half the length of membrane, cuneus horizontal, its fracture scarcely evident; front coxæ long, reaching or surpassing middle of mesosternum; joints 1 and 3 of hind tarsi subequal, 2 longest. Six species are known from our territory.⁹¹

KEY TO EASTERN SPECIES OF DICYPHUS.

- a. Smaller, length not over 3.7 mm.
- b. Corium with a large rounded black spot near apex; legs wholly pale yellow; basal margin of pronotum feebly concave, the mesoscutum only in small part exposed; length less than 3 mm. 1007. MINIMUS.
- bb. Corium without a prominent rounded dark spot near apex; head black, with a large pale spot behind eyes; basal margin of pronotum widely and deeply concave, the mesoscutum in great part or wholly exposed, length, 3.5—3.7 mm. 1008. NOTATUS.
- aa. Larger, length, especially of female, more than 4 mm.; basal margin of pronotum widely and deeply concave.
- c. Head and pronotum both dark brown to black; collar and usually a line between calli pale; elytra in great part pale; osteole scarcely evident, the rim of its peritreme feebly elevated. 1009. AGILIS.
- cc. Pronotum in great part dull yellow with only the sides darker; osteole distinct, the rim of its peritreme elevated, prominent.
- d. Elytra with numerous red lines and streaks; eyes separated from pronotum by a space equal to dorsal width of an eye. 1010. FAMELICUS.
- dd. Elytra more or less darkened with fuscous, rarely with red markings.
- e. Second antennal wholly black; vertex shining black with a large pale spot behind it; elytra not conspicuously marked with fuscous; form very slender. 1011. VESTITUS.
- ee. Second antennal with basal two-thirds or more yellow; vertex dull yellow; elytra conspicuously marked with fuscous. 1012. DISCREPANS.

1007 (1111). *DICYPHUS MINIMUS* Uhler, 1899, 59.

Head black, shining; disk of pronotum either pale fuscous with dark margins or wholly black, the collar pale yellow; scutellum fuscous to black with a yellowish triangular spot each side of base; elytra dull translucent yellow with widely scattered minute fuscous punctures, a large rounded spot or dot near apex of corium and the tip of cuneus dark brown or black; membrane pale dusky translucent, veins slightly darker; legs and under surface pale greenish-yellow, sides of ventrals and tips of tarsi darker. Antennæ blackish, joint 1 paler at base, slightly shorter than head; 2 twice as long and nearly as thick as 1; 3 and 4 more slender, 3 one-third longer than 2, 4 subequal in length to 2. Pronotum two-thirds wider at base than long, sides feebly concave, finely margined;

⁹¹The eastern records of *D. californicus* Stal (1859a, 259) are, as pointed out by Van Duzee (1917, 370) unreliable. It is therefore regarded as extralimital for this work.

disk minutely transversely wrinkled. Elytra very finely and sparsely punctate, minutely pubescent. Length, 2.8 mm.

Faywood, New Mexico, June 4 (*Gerhard*). Described by Uhler under the title, "A New Destructive Capsid," with the statement: "Numerous specimens of both sexes have been sent to me from various parts of Florida." No other record from that State. Recorded also from District of Columbia, New Mexico, Colorado and California.

1008 (—). *DICYPHUS NOTATUS* Parshley, 1922, 16.

Elongate, subparallel, male; suboval, female. Pronotum with collar and disk dull yellow, side margins and flanks black; elytra whitish-yellow, opaque, with vague reddish-brown areas on clavus, inner third and middle of corium; apical angles of corium and cuneus dark reddish-brown; membrane smoky-hyaline with a vague median dusky stripe, veins pale; legs pale yellow, femora with inconspicuous brown dots above and below; sterna black, ventrals dull yellow, their sides with brown or blackish margins. Joint 1 of antennæ pale, two-fifths longer than width of vertex; 2—4 black, 2 slightly shorter than length of head and pronotum united, 3 twice as long as 4. Pronotum twice as wide at base as long at middle, side and basal margins concave, front lobe smooth, shining, hind one sparsely punctate. Elytra indistinctly punctate, clothed with fine pale pubescence. Length, 3.5—3.7 mm.

Known only from Illinois and South Dakota. "Distinguished from all other American species of *Dicyphus* by its short antennæ, the second segment being scarcely as long as head and pronotum united, and by the large pale spot on base of head." (*Parshley*).

1009 (1108). *DICYPHUS AGILIS* (Uhler), 1877, 425.

Head and pronotum subglobose, color as in key; vertex often with a small yellowish spot near eye; mesoscutum dark brown; scutellum black, sometimes with a yellowish spot each side of base, both it and elytra very finely and sparsely pubescent; elytra dull greenish-white to pale straw-yellow, corium often with a vague pale fuscous stripe; apical half of clavus sometimes in part reddish; inner apical angle of corium and extreme tip of cuneus dark brown; membrane dusky translucent, veins brownish; legs yellow; tips of beak and tarsi fuscous or piceous; under surface shining brown, middle of ventrals yellow. Joints 1 and 4 of antennæ dull yellow, 2 and 3 pale to dark brown; 1 as long as width of vertex; 2 and 3 subequal, each about three times as long as 1; 4 one-third as long as 2. Pronotum about one-third wider at base than long; sides broadly concave, basal angles subdepressed, slightly prolonged; disk, except calli, finely transversely wrinkled and with a vague median impressed line. Length, 3.8—4.5 mm.

Marion Co., Ind., June 19; swept from the black raspberry, *Rubus occidentalis* L. Swannanoa and Highlands, N. Car., June—

July (*Brimley*). Georgetown, Colo., July 27 (*Gerhard*). Ranges from Quebec and New England west to the Pacific and southwest to North Carolina. Occurs on various species of *Rubus*.

1010 (1109). *DICYPHUS FAMELICUS* (Uhler), 1878, 413.

Pale greenish- or straw-yellow, shining; neck, narrow median line and impressions of pronotum, scutellum, inner margin and apical half of corium, inner apical margin of embolium and apex of cuneus, in part or wholly dull to bright red; embolium, basal half of corium and cuneus except tip, translucent yellow; apical half of membrane dusky, cells usually paler, veins brownish; legs and under surface pale straw-yellow, more or less reddish, femora with vague minute brown dots, tarsi in part fuscous. Joint 1 of antennæ reddish-brown, as long as head and neck united; 2 reddish-yellow, darker towards apex, more than twice as long as 1; 3 and 4 fuscous-brown, 3 two-thirds the length of 2, 4 one-half as long as 3. Eyes large, brown, placed in front of middle of head. Calli confluent, strongly convex, impressions before and behind them deep; basal portion of pronotum shorter than calli and collar united, minutely shagreened. Elytra minutely pubescent. Length, 4.5—5 mm.

Lake, Marion and Crawford counties, Ind., May 1—Sept. 28 (*W. S. B.*). Swept from herbage in and along the margins of dense woodland. Mineral Springs, Ind., Sept. 4 (*Gerhard*). Sunburst and Grandfather Mountain, N. Car., May—September (*Brimley*). The known range extends from Ontario and New England west to Michigan and Indiana and southwest to North Carolina. Knight records its food as *Rubus odoratus* L. Varies much in the extent of the red markings, these in some individuals covering the entire corium, in others sometimes wholly lacking.

1011 (1110). *DICYPHUS VESTITUS* Uhler, 1895, 46.

Elongate, slender, sides parallel. Vertex and tylus black, highly polished; upper surface of neck pale yellow, with narrow median line brown; pronotum dull yellow, collar paler, flanks black; mesoscutum black, the dark hue shining through the translucent basal lobe of pronotum; scutellum black, a small yellow spot on each basal angle; elytra straw-yellow, clavus tinged in vague streaks with brown; corium with a faint brown spot opposite apex of commissure and a small distinct one on inner apical angle; embolium and cuneus pale yellow, their extreme tips brown; membrane pale brown, the veins darker; legs pale yellow, femora with minute dark dots, tips of tarsi darker; mesosterna and sides of ventrals shining brown, remainder of under surface usually straw-yellow. Neck behind eyes shorter than width of vertex; eyes large, prominent. Antennæ relatively long and slender, fuscous-black; joint 1 paler at base, twice as long as width of vertex, 2 nearly three times as long as 1, 3 four-fifths the length of 2, 4 two-fifths as long as 3. Pronotum much as in *famelicus*, nearly twice as wide at base as long, hind

lobe shorter than calli and collar united, very minutely and sparsely punctate. Elytra subglabrous, tip of cuneus surpassing apex of abdomen in both sexes. Length, 4.5—5 mm.

Marion, Putnam and Knox counties, Ind., May 8—Oct. 26. Common locally on herbage in low wods along the banks of streams and swept by hundreds, Sept. 5, from water leaf, *Hydrophyllum canadense* L., in dense upland woods. Willow Springs, Ill., July 16 (*Gerhard*). Recorded from New England and New York, west to Colorado, British Columbia and California. Drake (1923, 77) swept it in July and August from ferns growing in shady places near Cranberry Lake, N. Y. According to Van Duzee (Ms.) the *D. gracilentus* Parsh. (1923b, 21) is a synonym.

1012 (—). DICYPHUS DISCREPANS Knight, 1923, 477.

Elongate, slightly widened behind, robust for the genus. Head dark brown, tylus and vertex dull yellow, darker along median line; pronotum dull yellow, the flanks blackish; mesoscutum and scutellum black, opaque, each with a pale spot at sides; clavus and corium straw-yellow, the former heavily tinged with fuscous, the latter with a vague median cross-bar extending across embolium and a spot on inner apical angle fuscous; cuneus pale yellow, its tip and that of embolium piceous; membrane dusky translucent, with pale markings across middle, veins darker; legs dull yellow, femora with minute brown dots, tarsi in great part fuscous; under surface dark brown, shining, ventrals rather thickly clothed with yellow inclined hairs. Joint 1 of antennæ, reddish-yellow, darker at base and apex, two-thirds longer than width of vertex; 2 yellow with apex blackish, two and two-third times longer than 1; 3 fuscous, paler at base, three-fourths as long as 2; 4 fuscous, one-half the length of 3. Neck behind eyes stout, as long as calli. Pronotum with transverse impressions deep, calli confluent, collar shorter than calli, the two united longer than middle of hind lobe, disk of latter minutely shagreened. Clavus, corium and femora minutely and sparsely punctate, each puncture bearing an inclined yellowish hair; costal margin ciliate with similar hairs. Length, 4—4.5 mm.

Marion Co., Ind., May 23—Sept. 13. Swept from low herbage in dense woodland along the banks of White River. Ranges from New Hampshire and New York west to Minnesota. Food plant, aster. Readily known by the robust form, short thick neck, fuscous markings of elytra, wholly dark under surface and distinct inclined hairs of pronotum and elytra.

III. CYRTOPELTIS Fieber, 1861, 76.

Elongate, subparallel, pubescent species, having the head but slightly exserted, front vertical, eyes very large, broader

than width of vertex, narrowly separated beneath; beak reaching middle coxæ; antennæ rather stout, half the length of body; pronotum trapezoidal, nearly twice as wide at base as long, calli low, without transverse constriction behind them, hind margin shallowly and broadly concave; mesoscutum partly exposed; elytra entire, apex of cuneus passing the tip of abdomen, costal margins parallel. Two species, usually recorded under the generic name *Engytatus* Reut., are known from our territory.

KEY TO EASTERN SPECIES OF CYRTOPELTIS.

- a. Larger, length 4.5—4.7 mm.; femora with rows of small black dots. 1013. VARIANS.
 aa. Smaller, length 3.5—3.8 mm.; femora without black dots. 1014. TENUIS.

1013 (1112). CYRTOPELTIS VARIANS (Distant), 1884, 271.

Pale greenish-yellow rather thickly clothed with long yellowish hairs; antennæ fuscous, the base of joints 1 and 2 black, tips of all the joints pale; elytra with commissure, tips of embolium and cuneus and veins of membrane blackish-fuscous; legs yellow, tibiæ with a black spot near base. Pronotum with base nearly twice as wide as apex, sides feebly concave, humeral angles depressed, slightly prolonged; calli confluent, smooth glabrous, disk behind them finely shallowly punctate, thickly pubescent. Mesoscutum rather widely exposed. Male with tylus black and antennæ longer than in female. Length, 4.5—4.7 mm.

Managua, Nicaragua (*Gerhard*). Described from Guatemala. Recorded from Biscayne Bay, Fla., and Texas. According to Uhler it is: "Widely distributed in the southern states, Mexico and the West Indies. In San Domingo it lives on various kinds of weeds growing on the sides of roads and in neglected gardens." The *Engytatus geniculatus* Reut. (1876, 83) is a synonym, his specific name being preoccupied.

1014 (1115). CYRTOPELTIS TENUIS Reuter, 1895, 139.

Color a nearly uniform pale greenish or straw-yellow, sparsely clothed with very fine prostrate pubescence; collar and embolium paler; calli and mesoscutum a deeper yellow; tips of corium and cuneus brown; membrane pale translucent, the veins slightly darker; tips of beak and tarsi fuscous; knees with a small brown spot. Joint 1 of antennæ as long as width of vertex, black at middle, its base and apex yellow; 2 nearly as stout and three and one-half times longer than 1, yellow, its base black, apex fuscous; 3 and 4 dusky yellow, 3 three-fourths as long as 2, 4 one-half as long as 3. Pronotum with sides straight, disk behind calli finely transversely rugose, minutely punctate. Mesoscutum slightly exposed. Length, 3.5—3.8 mm.

Dunedin and Moore Haven, Fla., March 7—27; swept from herbage in low mucky grounds. Recorded from Ft. Myers, Fla. A neotropical species of wide distribution.

IV. MACROLOPHUS Fieber, 1858, 326.

Elongate, subparallel species having the head porrect, its front declivent, eyes small, neck behind them short and wide; antennæ half the length of body, joint 1 stoutest, 3 and 4 more slender than 2; pronotum trapezoidal, about one and three-fourth times wider at base than long, disk with a narrow median longitudinal groove, also a vague transverse one behind calli, hind margin broadly, rather deeply concave; elytra entire, surpassing abdomen, clavus almost flat, cuneus horizontal; joint 2 of hind tarsi longer than 3. Two species occur in our territory.

KEY TO EASTERN SPECIES OF MACROLOPHUS.

- a. Joint 1 of antennæ wholly black; joint 2, two and one-third times the length of 1. 1015. SEPARATUS.
 aa. Joint 1 of antennæ yellow with apex and base fuscous; joint 2, three times as long as 1. 1016. TENUICORNIS.

1015 (1116). *MACROLOPHUS SEPARATUS* (Uhler), 1894a, 194.

Dull straw-yellow; apex of scutellum fuscous; elytra dirty white or pale yellow, thickly flecked with brownish dots or punctures, each bearing a short inclined blackish hair; embolium with a rounded spot near apex and extreme tip dark brown; cuneus pale yellow, its tip brown; membrane dusky, marbled with pale, veins brown; legs and under surface straw-yellow, rather thickly pubescent, tarsi and ventrals tinged with fuscous. Joint 1 of antennæ black, pale at extreme base, one-half longer than width of vertex; 2 dusky yellow, blackish at tip, two and one-third times longer than 1; 3 one-third longer than 2; 4 fuscous, one-fourth the length of 3. Beak reaching hind coxæ. Other characters as under generic heading. Length, 4—4.5 mm.

Hessville, Lake Co., Ind., Sept. 22 (*Gerhard*). Ranges from Ontario and New England west to the Pacific and southwest to Florida, Texas, New Mexico and the West Indies, some of the records doubtless belonging to the next species. Recorded from Ft. Myers, Fla.

1016 (—). *MACROLOPHUS TENUICORNIS* sp. nov.

More slender than *separatus*. Color much the same, head with a narrow black stripe behind each eye; front femora more yellow, their basal halves pale whitish translucent. Antennæ much longer and distinctly more slender, joint 1 yellow, the extreme tip and base blackish, more than twice as long as width of vertex, nearly two-thirds longer than in *separatus*; 2 yellow, the tip black, much more slender and distinctly longer than in *separatus*; 3 and 4 yellow, 3 as long as 2, 4 one-fourth the

length of 3. Elytra with numerous black seta-bearing punctures. Legs, especially the tibiæ, long and slender, hind tibiæ one-third longer than in *separatus*, more thickly beset with longer black spinules. Length, 4.2 mm.

Crawford Co., Ind., Aug. 1. Swept from low herbage along the banks of Blue River.

Subfamily IX. PHYLINÆ Reuter, 1910, 111.

Species of variable form and size, but agreeing in having the loræ narrow but very distinct, the impressed line above and below them deep; first joint of antennæ usually short; pronotum without a subapical constriction, sometimes flattened above near apex; inner wings usually with a distinct hamus; joint 3 of tarsi linear, longer than joint 1; arolia wanting, or if present very obscure and bristle-like; pseudarolia usually present, sometimes very large. "Male genitalia distinctive, the tip of penis twisting to the left, lying closely within bend of left clasper, extending downward and beyond it to the left side." (*Knight*).

For convenience of treatment the subfamily is divided into three tribes, separated as follows:

KEY TO TRIBES OF SUBFAMILY PHYLINÆ.

- a. Pronotum with a more or less flattened apical collar, but without a constriction behind it; abdomen usually distinctly constricted at base; form generally elongate. Tribe I. HALLODAPINI, p. 914.
- aa. Pronotum not flattened near apex, without the semblance of a collar; abdomen not constricted at base.
 - b. Prosternal xyphus depressed on its disk, its margins more or less elevated; pseudarolia prominent, united with the claws along their full length and sometimes projecting beyond them (pl. X, fig. 13), or attached only at basal angles and extending free and parallel with claws to the tips (pl. X, fig. 14).
Tribe II. ONCOTYLINI, p. 918.
 - bb. Prosternal xyphus convex, not distinctly margined; pseudarolia minute or wanting, when present attached to the inner basal angle of claw, never extending beyond tip of claws (pl. X, figs. 1—12).
Tribe III. PHYLINI, p. 921.

Tribe I. HALLODAPINI Van Duzee, 1916a, 204, 210.

To this tribe, as characterized above, belong three of our eastern genera.

KEY TO EASTERN GENERA OF HALLODAPINI.

- a. Pseudarolia connate with claws (pl. X, figs. 15, 16); elytra present in both sexes.

- b. Second antennal strongly abruptly clavate, its thickness at apex twice or more that at base; elytra surpassing abdomen in both sexes. I. TELEORHINUS, p. 915.
- bb. Second antennal nearly linear, slightly thickened toward apex; females brachypterous, ant-like in form. II. ORECTODERUS, p. 916.
- aa. Pseudarolia attached at base of claw, free apically, but extending practically parallel with claw (pl. X, fig. 17); second antennal linear; females apterous, ant-like in form.

III. COQUILLETIA, p. 917.

I. TELEORHINUS Uhler, 1890, 74.

Subfusiform, broadest behind middle. Head triangular, subconical, declivent, but slightly wider across eyes than apex of pronotum, inserted in thorax to eyes; beak almost reaching hind coxæ; pronotum subconical, its apex truncate, sides rounded, feebly concave, calli very low, separated by a wide shallow impression, hind margin straight; mesoscutum widely exposed; scutellum smooth, longer than wide, its tip acute; elytra entire, dilated behind, surpassing abdomen. Two species occur in the eastern states, and a third in California.

KEY TO EASTERN SPECIES OF TELEORHINUS.

- a. Joints 3 and 4 of antennæ united equal in length to 2; color steel blue. 1017. FLORIDANUS.
- aa. Joints 3 and 4 of antennæ united slightly longer than joint 2; color black. 1018. TEPHROSICOLA.
- 1017 (—). TELEORHINUS FLORIDANUS Knight Ms.

Head black; pronotum, scutellum and elytra steel-blue, all strongly shining; membrane dusky translucent, veins slightly darker; coxæ and femora bright orange-yellow, tibiæ dull greenish-yellow, their tips and joints 1 and 3 of tarsi fuscous; under surface dark brown to black, strongly shining. Joint 1 of antennæ shining black, three-fourths as long as width of vertex; 2 about four times as long as 1, its basal half slender, yellow, apical half black, twice or more as thick as 1, finely and densely pubescent; 3 and 4 dull yellow to fuscous, 4 three-fifths as long as 3. Pronotum with front portion smooth, basal half or more transversely rugose with vague shallow punctures between the rugæ. Clavus coarsely transversely rugose, corium more finely so, both with shallow punctures between the rugæ; apex of membrane broadly rounded. Length, 7—7.2 mm.

Dunedin, Fla., March 31—April 24; three specimens swept from Ericads along the bay front.

1018 (—). TELEORHINUS TEPHROSICOLA Knight, 1923, 476.

Black, shining, minutely pubescent; legs pale reddish-yellow, coxæ whitish, black at base; beak brownish, darker at base and apex. Joint 1 of antennæ black, three-fourths as long as width of vertex, 2 yellowish,

apical two-fifths black, five and three-fourth times as long as 1, its clavate portion twice as thick as 1; 3 and 4 fuscous, 3 two-thirds as long as 1, 4 nearly three-fourths the length of 3. Length, 7.3—7.6 mm.

Known only from Yaphank, Long Island, N. Y., and Lakehurst, N. J., where it was taken by Davis in June and July on flowers of the common goat's rue, *Cracca virginiana* L.

II. ORECTODERUS Uhler, 1876, 319.

Male—Elongate, slender, subparallel with head triangular, feebly declivent, wider across eyes than front margin of pronotum; eyes large, slightly distant from pronotum; vertex broad, subdepressed; beak reaching middle coxæ; pronotum subcampanulate, flattened above near apex; basal half of mesoscutum exposed; scutellum triangular, its apex acute; elytra entire, slightly wider behind middle; cuneus long and narrow, surpassing tip of abdomen. *Female*—Ant-like in form; head shorter, not exerted, much broader than in male, its front subvertical; elytra dimorphic, often much shorter than abdomen, the tips tapering to a point and vertical; base of abdomen strongly constricted into a pedicel, remaining segments forming a subglobose portion. Two species are known, one occurring in our territory.

1019 (1101). ORECTODERUS OBLIQUUS Uhler, 1876, 320.

Male—Black, shining; elytra brownish with basal half of corium and a large spot on base of cuneus dull yellow; membrane smoky-brown, veins darker; legs reddish-brown, front coxæ and tarsi usually in part darker; middle and hind coxæ paler; under surface shining black. Antennæ dull yellow to dark brown, joint 1 paler, as long as width of vertex, 2 as long as inner margin of clavus, gradually feebly thickened from base to apex, 3 much more slender, two-thirds the length of 2, 4 two-thirds as long as 3. Scutellum and basal half of pronotum very finely, transversely rugose, clavus more coarsely rugose, both it and corium minutely and sparsely punctate, each puncture bearing a very fine, short yellowish hair. Length, 7.2—7.8 mm. *Female*—Piceous to black, subopaque; scutellum in part or wholly pale dull yellow; corium and cuneus without pale markings; antennæ brownish to fuscous, joint 4 and tips of 2 and 3 blackish. Length, 5.8—6 mm.

Mt. McClellan, Colo., July 30 (*Gerhard*). Ranges from Ontario and New England west to Manitoba, the Dakotas, Colorado and Kansas. Not recorded south of New Jersey. Occurs in the west on the common sagebush, *Artemisia tridentata* Nutt. Knight (1923, 475) has described a variety *ferrugineous* from

Long Island, N. Y., based on some "ferrugino-testaceous" females which were taken in company with a reddish-colored ant (*Camponotus castaneus* Latr.) which the bug resembles very closely. Uhler stated (loc. cit.) that "immature forms of *obliquus* are chestnut-brown, with the white markings less distinct."

III. COQUILLETIA Uhler, 1890, 78.

Male—Elongate-oval, subopaque. Head long, narrow, its front almost vertical, vertex between eyes wider than apex of pronotum, its base not carinate, constricted to form a short neck; eyes large, oval, prominent, set obliquely; face below the eyes narrow, compressed, acutely subconical; beak reaching middle coxæ; pronotum short, campanulate, front lobe narrow, calli prominent, limited behind by a broad impression, hind lobe convex, basal angles rounded, hind margin subtruncate, leaving mesoscutum broadly exposed; scutellum wide, triangular, convex, elevated above clavus, separated from mesoscutum by a deep, transverse impression; elytra very long, membrane almost as long and nearly twice as wide as corium, costal margin visibly but very broadly concave, feebly reflexed; abdomen strongly constricted near base. *Female*—Ant-like in form. Head strongly declivent, wider in front of eyes than pronotum, area behind eyes as long as width of vertex; pronotum subquadrate, convex; meso- and metanota wholly exposed, their side margins slightly elevated, feebly carinated, elytra wanting; segments 1 and 2 of abdomen strongly constricted to form a pedicel, their pleuræ slightly elevated and carinate; remaining segments

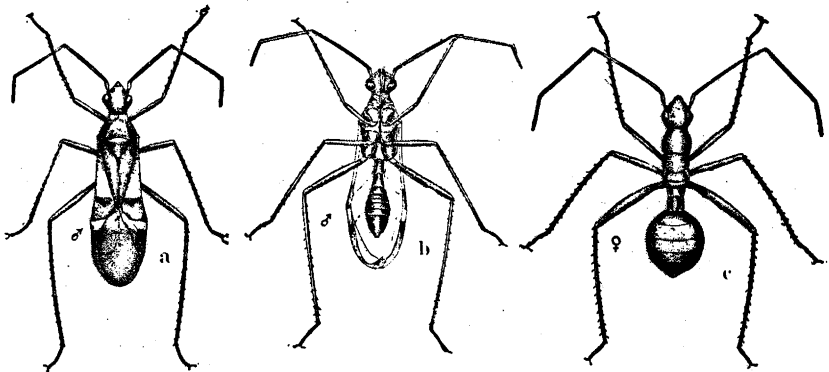


Fig. 188. *Coquillettia mimetica* Osb.; a and b, dorsal and ventral views of male; c, dorsal view of female, X 4½. (After Osborn).

strongly inflated to form a globose terminal portion (fig. 188, c) with conspicuous pleural fold.

Six species have been described from North America, one of which occurs in the eastern states.

1020 (1104). COQUILLETIA MIMETICA Osborn, 1898, 236.

Male—Head, front lobè of pronotum, scutellum, clavus and apical half of corium pale reddish-brown, shining; basal half of corium and basal third of cuneus whitish translucent; basal half of pronotum and cuneus, except base, fuscous-brown; membrane uniformly fuscous; femora pale reddish-brown; tarsi and apical halves of tibiæ, fuscous-brown; sterna and ventrals 1—4 brownish-yellow, hind margin of second ventral whitish; genital and ventrals 5 and 6 piceous, shining. Joint 1 of antennæ reddish-brown, 2—4 fuscous-brown; 1 subequal in length to width of interocular area; 2 and 3 subequal, each four times the length of 1, 4 one-third as long as 3. *Female*—Reddish-brown, shining; antennals 3 and 4 and apex of 2, tarsi and apical third of tibiæ dark fuscous-brown; second dorsal and globose portion of abdomen dark chestnut-brown, finely pubescent; osteolar peritreme and hind margin of first and second ventrals whitish. Structural characters as under genus heading. Length, male, 6.2—6.5 mm.; female, 5—5.5 mm. (Fig. 188).

Ames, Iowa, Aug. 29—Sept. 9, types (*Osborn*). Recorded from Jacksonville, Crescent City and Sanford, Fla. Ranges from Ohio west to Iowa and south to North Carolina, Florida and Arizona. "Occurs on elevated grassy ridges, and probably feeds on some of the grasses." (*Osborn*).

Tribe II. ONCOTYLINI Douglas & Scott, 1865, 32.

To this tribe, as characterized in the key, p. 914, belong three of our eastern genera of Phylinae.⁹²

KEY TO GENERA OF TRIBE ONCOTYLINI.

- a. Pseudarolia attached only at basal angles of claws, the free portion extending parallel with them to tips; claws short, strongly incurved (pl. X, fig. 14); apex of elytra in our species with six pale spots. I. MACROTYLUS, p. 919.
- aa. Pseudarolia connate, with claws for their full length; claws broadly curved (pl. X, fig. 13); apex of elytra without pale spots.
 - b. Beak not passing beyond hind coxæ; pseudarolia long, extending beyond tip of claws; mesoscutum broadly exposed. II. LOPUS, p. 920.
 - bb. Beak reaching or surpassing third ventral; pseudarolia not reaching apex of claw; extreme tips of claws sharply incurved. III. MEGALOCOLEUS, p. 920.

⁹²The North American records of the European *Oncotylus punctipes* Reut. are stated by Knight (1921, 281) to be based on another European species, *Plagiognathus chrysanthemi* (Wolff).

I. MACROTYLUS Fieber, 1858, 325.

Elongate, pubescent species having the head feebly exserted, its front subvertical; tylus prominent, viewed from the side strongly curved; beak reaching hind coxæ, its first joint slightly surpassing base of head; antennæ slender, about half the length of body; pronotum trapezoidal, its sides straight with margins carinate, hind margin straight; mesoscutum narrowly exposed; elytra entire, surpassing abdomen, sides subparallel; legs long, slender, tibiæ finely spinulose. Two of the ten known American species occur in the eastern states. For a monograph of the genus see Van Duzee, 1916c.

KEY TO EASTERN SPECIES OF MACROTYLUS.

- a.* Color fuscous-black; head dull greenish-yellow; basal spot of cuneus sometimes yellow; length, 3 mm. 1021. SEX-GUTTATUS.
aa. Color pale greenish-yellow; membrane and a bar on middle of cuneus blackish, strongly contrasting with the pale spots; length, 2—2.4 mm. 1022. AMÆNUS.

1021 (1200). MACROTYLUS SEX-GUTTATUS (Provancher), 1887, 150,

Fuscous-black, opaque; upper surface rather thickly clothed with short blackish hairs; head green or greenish-yellow, shining; cuneus with a large oval yellowish or white translucent spot at base, the apex also white; membrane with a large whitish-hyaline spot each side of apex; legs fuscous-black, apical half of tibiæ and middle of tarsi pale brownish-yellow. Joint 1 of antennæ black, reaching tip of tylus; 2 fuscous-black, apical fourth dull yellow, three and a half times as long as 1; 3 and 4 dusky, 3 two-thirds the length of 2, twice as long as 4. Elytra surpassing abdomen by three-fourths the length of membrane. Length, 3—3.2 mm. (Fig. 167, b).

Ottawa, Ontario, June 30 (*Van Duzee*). Cook Co., Minn., Aug. 14 (*Minn. Univ. Coll.*). Recorded from Quebec, Ontario, New England and New York. Breeds on *Aster*.

1022 (1201). MACROTYLUS AMÆNUS Reuter, 1909, 75.

Dull greenish-yellow; inner basal angle and apical half of cuneus and a spot on sides of apical third of membrane, ivory-white; an oblique bar across middle of cuneus velvety-black; membrane, except pale spot on sides, dark brown; femora dull yellow, the upper edge with a black stripe; tibiæ and tarsi fuscous or black; under surface dull yellow, the genital region dark brown, shining. Antennæ fuscous, the incisures pale, joint 2 as long as width of basal margin of pronotum. Pronotum twice as wide at base as long; width of apex subequal to length of middle of disk. Length, 2—2.5 mm.

Swannanoa, N. Car., June 20 (*Brimley*). Described from Connecticut. Recorded elsewhere only from Massachusetts, Pennsylvania and Estero, Fla.

II. LOPUS Hahn, 1833, 143.

Elongate, slender, subparallel, finely pubescent species having the head as broad across eyes as long, its front declivent; tylus convex, forming a continuous curve; beak reaching hind coxæ; pronotum trapezoidal, twice as wide at base as long, sides straight, hind margin straight at middle, rounded on sides; disk convex, declivent towards head; scutellum triangular, equilateral, on a higher plane than clavus; elytra entire, surpassing abdomen; clavus convex, deflected to corium; cuneus and membrane deflected; tarsi short, joints 2 and 3 subequal, 1 two-thirds the length of 2. One introduced European species occurs in the eastern states.

1023 (1207). LOPUS DECOLOR (Fallen), 1807, 102.

Female—Pale greenish- or straw-yellow, the elytra subhyaline; basal lobe of pronotum with three short fuscous stripes; scutellum whitish; clavus and inner half of corium slightly tinged with fuscous; membrane pale translucent, feebly iridescent; legs pale yellow, tarsi, claws and apical half of beak piceous; under surface dull yellow, sides of ventrals with vague fuscous spots. Joints 1 and 2 of antennæ dull yellow, apex of 1 and base of 2 usually darker; 1 two-thirds as long as width of vertex; 2 feebly thickened toward apex, four times as long as 1; 3 and 4 fuscous, filiform, 3 two-thirds as long as 2, 4 one-half the length of 3. Calli small, convex, rather prominent, widely separated. Length, 3.8—4 mm. *Male*—Larger and darker. Second antennal as long as width of vertex. Head with brown markings; calli usually blackish; elytra and corium more heavily tinged with fuscous; under surface black. Length, 4.5—4.8 mm.

Staten Island, N. Y., July 17 (*Davis*). Recorded in this country from Quebec, Ontario and the eastern seaboard states, as far south as Maryland; also from California. "Breeds on sedges; found in numbers and observed to oviposit in the stem of *Juncus dudleyi* Wieg. at McLean, N. Y." (*Knight*).

IV. MEGALOCOLEUS Reuter, 1890a, 254.

Differs from the other genera of the tribe mainly by the characters given in the generic key. One introduced European species has been taken in Massachusetts.

1024 (—). MEGALOCOLEUS MOLLICULUS (Fallen), 1829, 82.

Elongate, sides subparallel, male; suboval, female. Greenish-yellow or grayish-green, thickly clothed with conspicuous suberect dusky hairs;

clavus and corium often more or less tinged with brownish, the latter sometimes with an irregular transverse pale brown band across apical third; cuneus brownish, its base pale; membrane dusky, iridescent, the smaller cell and a spot near tip of cuneus blackish, veins yellowish; legs pale yellow, femora with a row of minute brown spots on lower face, apical half flecked above with brown. Antennæ yellowish or yellowish-brown, sparsely clothed with short stiff black hairs, joint 1 two-thirds as long as width of vertex; 2 three and one-half times as long as 1; 3 and 4 subfiliform, 3 two-thirds the length of 2, 4 one-third as long as 3. Length, 4.5—5.2 mm.

Deal and Chiltern Hills, England, August (*British Mus. Coll.*). Known in this country only from Massachusetts. Occurs in England on tansy, *Tanacetum vulgare* L., and yarrow, *Achillea millefolium* L.

Tribe III. PHYLINI Van Duzee, 1916a, 204.

This tribe, as characterized in the key, p. 914, contains the great majority of our eastern species of the subfamily Phylinae, the tribe being represented in the eastern states by 16 genera. For convenience of treatment these are separated into two groups or subtribes.

KEY TO SUBTRIBES OF TRIBE PHYLINI.

- a. Pubescence, when present, composed of a single type of fine, sub-erect or prostrate hairs; upper surface sometimes nearly glabrous.
SUBTRIBE I, p. 921.
- aa. Pubescence composed of closely appressed tomentose or scale-like deciduous hairs, usually intermixed with more erect ones.
SUBTRIBE II, p. 949.

SUBTRIBE I.—PHYLINI.

KEY TO GENERA OF SUBTRIBE I, PHYLINI.

- a. Second antennal distinctly longer than width of head across eyes; front of head more or less produced, the facial angle, when viewed from the side (the angle between the lower margin of bucculæ and tylus) less than a right angle.
- b. Vertex without an impression each side near eye; joint 3 of hind tarsi usually slightly shorter than 2.
- c. Tibiæ pale, their spines usually dark but without black spot at base.
- d. Joint 2 of antennæ slender, distinctly thinner than joint 1; tylus flat, confluent with front; upper surface chiefly brown or blackish, sometimes in part pale.
- e. Joint 1 of antennæ not or scarcely passing tip of tylus; spines of tibiæ pale. I. STHENARUS, p. 922.
- ee. Joint 1 of antennæ distinctly passing tip of tylus; spines of tibiæ black without spots at base. II. MICROPHYLELLUS, p. 923.

- dd.* Joint 2 of antennæ swollen, its apex at least equal in thickness to joint 1; color chiefly reddish, elytra and ventrals usually in part fuscous. III. RHINOCAPSUS, p. 925.
- cc.* Tibiæ chiefly pale, their spines with a black spot at base, or if not, then the upper surface and tibial spines also pale. IV. PLAGIOGNATHUS, p. 927.
- bb.* Vertex with an impression each side near margin of eye; joints 2 and 3 of hind tarsi subequal. V. MICROSYNAMMA, p. 945.
- aa.* Second antennal not or but slightly longer than width of head across eyes; head not or scarcely produced, the facial angle forming a right angle.
- f.* Second antennal linear or nearly so, never thicker than first one; hind tarsi less than one-third the length of tibiæ.
- g.* Small black species; hind femora black; head broad, about one-fifth narrower than hind margin of pronotum; pseudarolia connate with claws to their tips or nearly so (pl. X, fig. 1). VI. CHLAMYDATUS, p. 946.
- gg.* Small pale to yellowish species; legs pale, hind femora dotted with black; head narrower; first antennal with a black ring; pseudarolia minute, not extending beyond middle of claw (pl. X, fig. 9). VII. CAMPYLOMMA, p. 948.
- ff.* Second antennal strongly thickened and flattened, male, distinctly thickened toward apex, female; hind tarsi nearly half the length of tibiæ. VIII. LEUCOPÆCILA, p. 948.

I. STHENARUS Fieber, 1858, 321.

Small elongate-oval, pubescent species having the head broader across eyes than long, its front strongly deflexed; vertex convex, carinate at base; pronotum short, subtrapezoidal, twice as broad across base as long, hind margin truncate, hind angles rounded, calli subobsolete; mesoscutum concealed; elytra entire, surpassing abdomen, cuneus subhorizontal; beak reaching first ventral. One of the three known North American species occurs in Florida.

1025 (—). STHENARUS PLEBEJUS Reuter, 1907b, 26.

Head, pronotum and scutellum fuscous-black; elytra and humeral angles of pronotum dull brownish-yellow to fuscous-brown, cuneus concolorous; membrane dusky-hyaline, the apical half iridescent and minutely rugose; legs pale straw-yellow, tarsi and apical third of tibiæ tinged with fuscous; under surface dark fuscous-brown tinged with reddish, middle of ventrals paler. Joint 1 of antennæ straw-yellow, two-fifths as long as width of vertex; 2 reddish-yellow, darker at tip, its apical half slightly thickened, four and one-third times as long as 1; 3 and 4 dusky, subequal in length, united two-thirds as long as 2. Upper surface sparsely clothed with long fine yellowish hairs. Front half of pronotum smooth; hind one finely transversely rugose. Scutellum and elytra similarly rugose. Length, 2—2.8 mm.

Dunedin, Fla., Nov. 18—Feb. 6 (*W. S. B.*); several swept from low ground herbage. Soledad, Cuba, Feb. 9 (*Knight*). Described from Jamaica; not before recorded from this country.

II. MICROPHYLELLUS Reuter, 1909, 76.

Small elongate- or oblong-oval species having the head strongly declivent, about one-third narrower than base of pronotum; beak reaching to or beyond hind coxæ, its first joint reaching base of head; antennæ slender, joint 1 usually passing tip of tylus; pronotum with base about twice as wide as apex, sides straight, hind lobe convex, declivent forward; mesoscutum rather broadly exposed; elytra entire, membrane 2-celled; legs usually wholly pale, femora often with fuscous dots. Seven species have been recorded from our territory.

KEY TO EASTERN SPECIES OF MICROPHYLELLUS.

- a. Embolium, cuneus and basal half of corium pale or yellowish; scutellum pale with median line blackish; host plant, white oak.
 - 1026. MACULIPENNIS.
- aa. Elytra uniformly pale brown to black.
 - b. Joint 2 of antennæ black; joint 1 pale on apical half; host plant, large-leaved aster, *Aster macrophyllus* L. 1027. NIGRICORNIS.
 - bb. Joint 2 of antennæ pale, sometimes fuscous at base.
 - c. Second antennal shorter than width of pronotum at base.
 - d. Joint 1 of antennæ yellowish, fuscous only at base; femora usually with fuscous dots; length, 3—3.3 mm.; host plants, elm and white oak. 1028. MODESTUS.
 - dd. Joint 1 of antennæ brown or blackish.
 - e. Smaller, length 2.6—2.8 mm.; beak not reaching beyond base of hind coxæ; femora uniformly yellowish; host plant, hemlock. 1029. TSUGÆ.
 - ee. Larger, length 3.3 mm.; beak reaching nearly to first ventral; femora with fuscous spots. 1030. TUMIDIFRONS.
 - cc. Second antennal as long as or longer than width of pronotum at base.
 - f. Beak reaching to or beyond fourth ventral; hind femora uniformly pale; host plant, hazelnut. 1031. LONGIROSTRIS.
 - ff. Beak reaching only to middle of hind coxæ; hind femora with fuscous spots on front face; host plant, sugar maple. 1032. ELONGATUS.

1026 (—). MICROPHYLELLUS MACULIPENNIS Knight, 1923, 456.

Pale fuscous with paler markings as in key, thickly clothed with fine prostrate yellow pubescence; head blackish, vertex pale; pronotum with middle of disk and basal angles greenish-yellow; mesoscutum blackish; membrane fuscous-hyaline, paler along apical half of cuneus; legs pale

yellow, basal half of hind coxæ and tips of tarsi fuscous; under surface dark brown, shining, minutely pubescent. Joints 1 and 2 of antennæ straw-yellow, fuscous at base; 1 slightly shorter than width of vertex; 2 dusky at apex, nearly three times as long as 1; 3 yellowish tinged with dusky, about three-fifths the length of 2; 4 two-thirds as long as 3. Beak reaching tips of middle coxæ. Length, 3.4—3.6 mm.

St. Anthony Park, Minn., June 10 (*Minn. Univ. Coll.*). Recorded only from New York and Minnesota. A form from Maine with second antennal blackish and femora dotted with fuscous Knight calls var. *fuscicornis*.

1027 (—). *MICROPHYLELLUS NIGRICORNIS* Knight, 1923, 457.

Black, strongly shining, minutely dusky pubescent; membrane and veins uniformly fuscous; legs pale straw-yellow, bases of coxæ and tips of tarsi blackish; ventrals black with yellowish and black pubescence. Antennæ pale yellowish, joint 2 and base of 1 black; 1 three-fourths as long as width of vertex, 2 nearly four times as long as 1, 3 one-fourth shorter than 2, nearly twice as long as 4. Length, 3.8—4 mm.

Ithaca, N. Y., July 7 (*Minn. Univ. Coll.*). Recorded elsewhere only from Parry Sound, Ontario, and Batavia, N. Y.

1028 (1225). *MICROPHYLELLUS MODESTUS* Reuter, 1912a, 62.

Color a nearly uniform brown to blackish; rather thickly clothed with fine inclined yellowish hairs; membrane fuscous-translucent, feebly iridescent, veins slightly paler; beak, legs and antennæ pale yellow; femora usually with a row of small vague fuscous dots along the upper side of outer face; tips of tibiæ and tarsi blackish. Joint 1 of antennæ scarcely half as long as width of vertex, 2 about four times longer than 1, slightly shorter than width of pronotum at base, 3 and 4 united, about as long as 2. Beak reaching hind coxæ. Length, 3—3.3 mm.

Marion, Knox and Posey counties, Ind., June 4—26; beaten from elm and swept from low herbage (*W. S. B.*). Mill Brook, N. Car., May 11—13 (*Brimley*). The known range extends from Ontario and New England west to Indiana and southwest to North Carolina. "Found most frequently among aphid curled leaves of elm and white oak, feeding to some extent on honey dew, but sometimes on eggs of the elm leaf beetle, *Galerucella luteola* Mull." (*Knight*).

1029 (—). *MICROPHYLELLUS TSUGÆ* Knight, 1923, 456.

Dark brown thinly clothed with pale yellowish pubescence; elytra feebly translucent, membrane uniformly brownish-hyaline, iridescent; legs yellowish, bases of coxæ and tips of tarsi fuscous; ventrals dark brown. Joint 1 of antennæ fuscous-black, three-fifths as long as width of vertex; 2 yellowish, fuscous at base, nearly four times as long as 1; 3 dull yellow, three-fifths the length of 2; 4 dusky, two-thirds as long as 3. Length, 2.6—2.8 mm.

Tompkins County, N. Y., July 3 (*Minn. Univ. Coll.*). Known only from that State.

1030 (—). *MICROPHYLELLUS TUMIDIFRONS* Knight, 1923, 455.

Black, moderately shining, clothed with pale pubescence; elytra feebly translucent; membrane and veins wholly pale fuscous; legs yellow, coxæ black, femora with two rows of pale fuscous spots, third tarsal fuscous; ventrals black, dusky pubescent. Joint 1 of antennæ black, slightly more than half as long as width of vertex; 2 yellow, dusky pubescent, four times as long as 1; 3 yellow, two-thirds the length of 2; 4 dusky yellow, one-fourth shorter than 3. Front of head distinctly swollen. Pronotum with an evident but slight impression in front of calli. Length, 3.3 mm.

Recorded only from Truro, Nova Scotia. Host plant unknown.

1031 (—). *MICROPHYLELLUS LONGIROSTRIS* Knight, 1923, 458.

Color above and below dark brown to black, shining, very sparsely clothed with minute dusky hairs; membrane and veins uniform dark fuscous-brown; legs pale yellow without dots; tarsi tinged with dusky. Antennæ yellow, joints 3 and 4 slightly darker; joint 1 slightly shorter than width of vertex, 2 four and a third times longer than 1, 3 nearly three-fourths the length of 2, 4 one-half as long as 3. Pronotum nearly twice as wide at base as long at middle, both it and elytra minutely granulate, without visible punctures. Length, 3.4—3.8 mm.

New Haven, Conn., July 7 (*Walden*). Willow Springs, Ill., June 7 (*Gerhard*). The known range extends from New England west to Illinois and Minnesota, mostly north of latitude 40°.

1032 (—). *MICROPHYLELLUS ELONGATUS* Knight, 1923, 458.

Black, shining, clothed with dusky pubescence; membrane and veins uniformly fuscous; legs straw-yellow, hind and middle coxæ and tips of tarsi blackish; ventrals black, shining. Antennæ yellowish, joints 1 and 2 darker at base, 1 four-fifths as long as width of vertex, 2 four and one-fourth times the length of 1, 3 two-thirds as long as 2, 4 two-fifths the length of 3. Length, 3.8—4 mm.

Recorded only from Batavia, N. Y.

III. RHINOCAPSUS Uhler, 1890, 81.

Elongate-oval shining species having the head declivent, wider across eyes than apex of pronotum; vertex subquad-rangular, transverse, slightly convex; tylus long, prominent, curved; antennæ stout, joint 1 shorter than head, 2 subfusiform, as long as vertex and pronotum united, 3 and 4 abruptly setaceous, united much shorter than 2; pronotum trapezoidal,

sides strongly declivent, their margins distinct, hind margin feebly concave; mesoscutum broadly exposed; scutellum short, flat, its apex acute; elytra entire, costal margin broadly regularly curved throughout its length; apical half of clavus acutely narrowed to tip; outer margin of cuneus incurved at base forming a notch; legs stout, hind femora with rows of dots; joint 1 of hind tarsi very short, 2 and 3 subequal. Three species occur in the eastern states.

KEY TO EASTERN SPECIES OF RHINOCAPSUS.

- a. Second antennal black apically, its basal third or more reddish-yellow. 1033. VANDUZEEI.
- aa. Second antennal uniformly dark reddish-brown or black.
 - b. Joint 2 of antennæ not longer than width of pronotum at base; larger, length 4.3—5 mm. 1034. RUBRICANS.
 - bb. Joint 2 of antennæ distinctly longer than width of pronotum at base; smaller, length 3.4 mm. 1035. MINIATUS.

1033 (1228). *RHINOCAPSUS VANDUZEEI* Uhler, 1890, 82.

Head, pronotum, scutellum and sterna in great part red, tylus, cheeks and loræ black; basal half of pronotum and scutellum often tinged with fuscous; elytra and ventrals dark fuscous-brown to black; membrane, including veins, paler fuscous-brown; legs dull yellow, the brown dots on outer face of front and middle femora very small, on hind ones conspicuous. Joint 1 of antennæ yellow, 2 as in key, 3 dusky yellow, 4 fuscous. Pronotum two-thirds wider at base than long, calli low and vaguely defined; disk almost smooth. Length, 3.5—4 mm.

Pentwater, Mich., July 15 (*Gerhard*). Swannanoa, N. Car., July (*Brimley*). The known range extends from Ontario and New England west to Michigan and southwest to North Carolina. Host plant, wild red raspberry, *Rubus strigosus* Michx.

1034 (1226). *RHINOCAPSUS RUBRICANS* (Provancher), 1887, 154.

Head, front portion of pronotum, femora and under surface a clear red; elytra uniform reddish-brown; legs reddish-testaceous; hind femora without black spots, tarsi brown. Antennæ dark brown to blackish; joint 1 slightly passing tip of tylus; 2 wholly black, stouter than 1, longer than the others united. Vertex without a basal margin. Beak reaching hind femora. Pronotum smooth, calli scarcely evident. Length, 4.3—5 mm.

Described from Saint Gertrude, Quebec. Recorded from Maine, Massachusetts and Lake Toxaway, N. Car.

1035 (—). *RHINOCAPSUS MINIATUS* Knight, 1923, 460.

Color a nearly uniform shining cinnabar red, clavus and corium slightly darker; membrane pale fuscous, feebly iridescent; ventrals slightly tinged with fuscous; legs reddish-yellow without darker dots; tibiæ and tips of tarsi tinged with fuscous. Joint 1 of antennæ red, one-

half shorter than width of vertex; 2 and 3 dusky red, 2 four and a half times longer than 1, 3 three-fifths as long as 2; 4 dusky, one-half as long as 3. Beak reaching middle of hind coxæ. Pronotum twice as wide at base as long, calli indistinct, disk smooth, both it and corium sparsely clothed with very fine prostrate hairs. Length, 3.4 mm.

Lakehurst, N. J., June 27 (*Davis*). This is the type locality, and it is not definitely recorded elsewhere. Uhler, in his notes following the description of *R. vanduzeei* says: "A red variety of this insect, but of smaller size, occurs in Maryland, Virginia, North Carolina and Florida." He probably referred to Knight's *miniatus*. This is the only Florida record of a member of the genus.

IV. PLAGIOGNATHUS Fieber, 1858, 320.

A large genus of small, oval, more or less shining species, the males being usually elongate or oblong, with sides subparallel, the females slightly more robust with margins of embolium feebly curved. They have the head wider across eyes than apex of pronotum, its front strongly declivent or subvertical; tylus narrow, convex; antennæ slender, about half the length of body, joints variable in length as to species, the second always much longer than width of head; beak reaching or surpassing hind coxæ; pronotum trapezoidal, sides of disk strongly declivent, their margins rounded, not carinate, straight or feebly sinuate; calli low but distinct, usually more or less confluent, with an impression between the middle of their bases; hind lobe convex, declivent forward, its hind margin slightly rounded; mesoscutum rather broadly exposed; scutellum triangular, equilateral; elytra entire, surpassing abdomen, clavus deflected to corium, cuneus deflexed, the base of its outer margin incurved to form a slight notch; legs usually in great part pale with femora more or less mottled or dotted with brown or fuscous; tibial spines (except in Group A) with a black spot at base; joint 2 of hind tarsi longer than 3. Thirty-five species and numerous varieties are known from the eastern states. For convenience of study these are separated into three groups.

KEY TO GROUPS OF EASTERN SPECIES OF PLAGIOGNATHUS.

- a.* Tibial spines yellowish or pale brown without distinct black spots at base; general color pale greenish-yellow. GROUP A, p. 928.
- aa.* Tibial spines dark with a black spot at base of each spine, the spots sometimes wanting toward apex of tibiæ.

- b. Joint 2 of antennæ dark fuscous to black, sometimes slightly paler at middle, but always more black than pale. GROUP B, p. 929.
 bb. Joint 2 of antennæ chiefly pale, blackish only at base. GROUP C, p. 938.

GROUP A.—PLAGIOGNATHUS.

This group comprises only two of our known eastern species.

KEY TO EASTERN SPECIES OF GROUP A, PLAGIOGNATHUS.

- a. First antennal with two black lines, second with one; scutellum pale greenish-yellow; beak reaching middle of hind coxæ. 1036. NIGROLINEATUS.
 aa. First and second antennals without black lines; scutellum fuscous; beak reaching hind margins of middle coxæ. 1037. ILICIS.
 1036 (—). PLAGIOGNATHUS NIGROLINEATUS Knight, 1923, 443.

Pale greenish- or straw-yellow, rather thickly clothed with fine sub-erect yellowish hairs; membrane pale translucent, usually with a streak on apical half and a spot in smaller cell, fuscous; front and middle femora usually with a short black line on upper face; apical half of hind femora with a black line on inner face and a black dot near middle of outer one; tibiæ dull yellow, with a small black spot just below knees on upper face. Joints 1 and 2 of antennæ with black lines as in key, about four-fifths as long as width of vertex, 2 nearly five times as long as 1, 3 one-half the length of 2, 4 two-fifths as long as 3. Length, 4.1—4.3 mm.

Dunedin, Fla., March 28—April 17. Beaten from foliage of live oak, *Quercus virginiana* Mill., swept from low herbage along the bay front, and taken at porch light. Recorded only from Connecticut and Minnesota. Knight gives its host plant as *Quercus macrocarpa* Michx., and its range is probably coextensive with that tree. Easily known by the uniform pale color and black lines of antennæ and legs.

- 1037 (—). PLAGIOGNATHUS ILICIS Knight, 1925a, 305.

Head and pronotum greenish-yellow, the latter with front and side margins more greenish and basal half of disk tinged with fuscous; mesoscutum dull yellow; elytra pale yellowish-translucent, clothed with yellowish-brown pubescence; apical halves of clavus, embolium and corium pale fuscous; membrane uniformly pale fuscous-brown; legs straw-yellow, femora marked with small vague fuscous dots; tibiæ pale, spines yellowish-brown without spots at base; under surface greenish-yellow. Joints 1 and 2 of antennæ greenish-yellow, apical half of 2 dusky; 1 but slightly more than half as long as width of vertex, 2 four and three-fourth times the length of 1; 3 and 4 brownish to fuscous, 3 three-fifths as long as 2, 4 three-fifths the length of 3. Female more robust than male, upper surface rather uniformly yellowish; scutellum and a cloud on apical half of corium fuscous-brown. Length, 3.4—3.7 mm.